Welch Allyn®
Q-Tel® RMS

Rehabilitation Management System

USER MANUAL

Manufactured by Welch Allyn, Inc., Skaneateles Falls, NY U.S.A.

CAUTION: *Federal law restricts this device to sale by or on the order of a physician.*

Software: v5.0.1 2019-09

The information contained in this manual is subject to change without notice.
All changes will be in compliance with regulations governing manufacture of medical equipment.

For patent information, please visit www.welchallyn.com/patents

For information about any Welch Allyn product, visit: https://www.welchallyn.com/en/about-us/locations.html

Customer Service and Technical Support: https://www.welchallyn.com/en/other/contact-us.html
1.888.667.8272, mor_tech.support@hillrom.com

REF **9515-193-50-ENG Rev F**
Revision date: 2019-09

\# 901145 REHABILITATION MANAGEMENT SYSTEM

Welch Allyn, Inc.
4341 State Street Road
Skaneateles Falls, NY 13153 USA

welchallyn.com

EC REP EU IMPORTER

Welch Allyn Limited
Navan Business Park, Dublin Road,
Navan, Co. Meath C15 AW22
Ireland

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SERVICE AND SPARE PARTS

Assistance and Parts

If the product fails to function properly or if assistance, service or spare parts are required, contact the nearest Welch Allyn Technical Support Center.

USA Phone: 1.888.667.8272
Email: mor_tech.support@hillrom.com

For service outside the USA, contact your local representative.

Please provide:

- Product name and model number and complete description of the problem
- The serial number of your product (if applicable)
- The complete name, address and phone number of your facility
- For out-of-warranty repairs or spare parts orders, a purchase order (or credit card) number
- For parts order, the required spare or replacement part number(s)

Repairs

All repairs on products under warranty must be performed or approved by Welch Allyn. Unauthorized repairs will void the warranty. In addition, whether or not covered under warranty, any product repair shall exclusively be performed by Welch Allyn certified service personnel.
If your product requires warranty, extended warranty, or non-warranty repair service, please call first the nearest Welch Allyn Technical Support Center. A representative will assist you in troubleshooting the problem and will make every effort to solve it over the phone, avoiding potential unnecessary returns.

In case the return cannot be avoided, the representative will record all necessary information and will provide a Return Material Authorization (RMA) number, as well as the appropriate return address. A Return Material Authorization (RMA) number must be obtained prior to any return.

Packing Instructions:

Remove patient cable, battery, and Secure Digital memory card (as appropriate) prior to packing, unless you suspect they are associated with the problem.

Whenever possible, use the original shipping carton and packing materials.

Include a packing list and the Welch Allyn Return Material Authorization (RMA) number.

It is recommended that all returned goods be insured. Claims for loss or damage to the product must be initiated by the sender.

NOTICES

Manufacturer's Responsibility

Welch Allyn is responsible for the effects on safety and performance only if:

- Assembly operations, extensions, readjustments, modifications, or repairs are carried out only by persons authorized by Welch Allyn.
- The device is used in accordance with the instructions for use.

Responsibility of the Customer

The user of this device is responsible for ensuring the implementation of a satisfactory maintenance schedule. Failure to do so may cause undue failure and possible health hazards.

This manual must be kept in a safe place to prevent its deterioration and/or alteration. The user and Welch Allyn authorized personnel must have access to this manual at any time.

The user of this device must periodically check the accessories, their functionality and integrity.

Equipment Identification

Welch Allyn equipment is identified by a serial and reference number on the bottom of the device. Care should be taken so that these numbers are not defaced.

Copyright and Trademark Notices

Other Important Information

The information in this document is subject to change without notice.

Welch Allyn makes no warranty of any kind with regard to this material including, but not limited to, implied warranties of merchantability and fitness for a particular purpose. Welch Allyn assumes no responsibility for any errors or omissions that may appear in this document. Welch Allyn makes no commitment to update or to keep current the information contained in this document.

WARRANTY INFORMATION

Limited Warranty Statement

Welch Allyn warrants that the Welch Allyn Q-Tel RMS you have purchased meets the labeled specifications of the product and will be free from defects in materials and workmanship that occur within 1 year after the date of purchase. Accessories used with the Product are warranted for 90 days after the date of purchase.

The date of purchase is: 1) the date specified in our records, if you purchased the Product directly from us, 2) the date specified in the warranty registration card that we ask you to send to us, or 3) if you don't return the warranty registration card, 120 days after the date on which the Product was sold to the dealer from whom you bought the Product, as documented in our records.

This warranty does not cover damage caused by: 1) handling during shipping, 2) use or maintenance contrary to labeled instructions, 3) alteration or repair by anyone not authorized by Welch Allyn, and 4) accidents.

You assume all responsibility for the use of the Product with any accessory that does not meet the requirements described in the Product documentation.

If a product or accessory covered by this warranty is determined to be defective because of defective materials, components, or workmanship, and the warranty claim is made within the warranty period described above, Welch Allyn will, at its discretion, repair or replace the defective Product or accessory free of charge.

You must obtain a return authorization from Welch Allyn to return your Product before you send it to Welch Allyn's designated service center for repair.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. WELCH ALLYN'S OBLIGATION UNDER THIS WARRANTY IS LIMITED TO REPAIR OR REPLACEMENT OF PRODUCTS CONTAINING A DEFECT. WELCH ALLYN IS NOT RESPONSIBLE FOR ANY INDIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM A PRODUCT DEFECT COVERED BY THE WARRANTY.

USER SAFETY INFORMATION

WARNING: This alert identifies hazards that may cause serious personal injury or death.

Caution: This alert identifies hazards that may cause minor personal injury, product or property damage.

***NOTE**: This manual may contain screen shots and pictures. Any screen shots and pictures are provided for reference only and are not intended to convey actual operating techniques. Consult the actual screen in the host language for specific wording.*

WARNING(S)

- **WARNING! Restricted use.** The Q-Tel RMS System is intended for use in a hospital or clinical setting by trained and authorized personnel who are acting on the orders or under the supervision of a physician. The system is intended as a complement to, not a substitute for, patient observation by health care professionals. Q-Tel RMS should not be used for unintended activities.

- **WARNING! Use only Welch Allyn approved equipment.** Use of accessories or cables other than those specified, with the exception of accessories or cables sold by Welch Allyn as replacement parts for internal components, may result in increased emissions or decreased immunity of the system. Use only Welch Allyn-approved and specified parts and accessories. Use of other parts can degrade performance and/or safety and may void warranty or contract coverage.

- **WARNING! Restricted use.** The Q-Tel RMS system needs special precautions regarding EMC and needs to be installed and put into service according to the guidelines of the EMC declaration tables.

- **WARNING! Audible alarms.** Do not connect any devices to the Aux input on the speakers as this may mask an audible alarm.

- **WARNING! Audible alarms are not available during a power failure.** During a power outage, the audible alarms may not function; discharge all patients.

- **WARNING! The *Lead Off* condition disrupts the alarm function.** The arrhythmia alarm detection system must have all leads properly connected to the patient in order to function correctly. If a lead-off condition occurs and the *Lead Off* alarm displays, reattach the lead as soon as possible.

- **WARNING! RF Interference.** Portable and mobile RF communications equipment may affect the Q-Tel RMS system. Observe the recommended separation distances in the EMC declaration tables.

- **WARNING! Improper system performance.** The Q-Tel RMS system should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, observe the Q-Tel RMS system to verify normal operation in the configuration in which it will be used.

- **WARNING! Review default settings.** For optimal patient safety, all operators and clinicians using the system must review the system default settings periodically.

- **WARNING! Explosion hazard.** This instrument is not approved for use and must not be operated in the presence of flammable anesthetics.

- **WARNING! Shock hazard.** Do not place fluids on top of the system. Never spill liquid of any kind on this product. Connectors are not fluid proof. Fluid spilled onto the internal parts of the system can create an electrical hazard. If fluid enters the system, turn off the power immediately and call Technical Support. Do not use until the interior has been cleaned and tested. Water tight boots are commercially available, if needed, for your facility's environment.

- **WARNING! Shock hazard.** Do not use spray on liquid cleaners/aerosol cleaners. Only use damp cloth for cleaning.

- **WARNING! Shock hazard.** Do not use this product near water.

- **WARNING! Possible injury or system damage.** Do not place this product on an unstable cart, stand, or table. This product may fall, causing serious damage to the product or to a person nearby.

- **WARNING! Visual inspection required.** Visually inspect the system periodically to verify functionality. Be aware of and correct any system issues that can affect correct operation and full functionality, such as inoperable hardware, out of adjustment hardware, powered off hardware, or system error messages. Before each use of the equipment, visually check all connector cables and the power receptacle. Make sure all power cables are plugged in securely. Check for worn or damaged plastic coverings, frayed or broken wires, cracked connections, and other signs of damage. Do not operate the equipment if the integrity of these items is in question.

- **WARNING! Monitor system data.** Q-Tel RMS provides ECG monitoring data. The operator must be aware of the meanings of this data and the patient's condition to ensure that the patient is not over-exerted during the rehab session.

- **WARNING! Monitor system data.** Network slowdowns and system failures may delay or disable the display of ECG waveforms and visual alarms on network-connected Q-Tel RMS Workstations. Alarm volumes should be set sufficiently loud on the Q-Tel RMS Tower to be heard adequately over the entire rehab facility. The towers are the primary source of alarm notification. ECG waveforms displayed on the Workstation that are not being updated should not be relied upon for current patient status.

- **WARNING! Loss of ECG monitoring due to network failure.** Q-Tel RMS is designed to generate an alarm notification when the signal from the transmitter is lost or compromised. Ensure that instructions have been properly followed for patient monitoring preparation and take necessary steps to resolve the problem to lessen the possibility of harm.

Caution(s)

- **Caution: UPS software is not compatible with Q-Tel RMS.** Do not install the UPS software that comes with the UPS device.

- **Caution: Connect only the computer, monitor, and HUB to the UPS.** Do not connect any components, other than the computer, monitor, and HUB into the UPS. See the Q-Tel RMS Main Tower block diagram.

- **Caution: System damage.** Do not obstruct the air holes on the unit. Improper ventilation and air flow could cause the unit to overheat, resulting in automatic shutdown. Slots and openings in the cabinet and the back or bottom are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, do not block or cover these openings. Do not place the product on a rug or similar surface that may block ventilation openings. Never place this product near or over a radiator or heat register. Do not place this product in a built-in installation unless proper ventilation is provided.

- **Caution: Possible interference.** Other electrical devices used on or near patients connected to this device can cause arrhythmia-like artifact on ECG recordings or displays. Those devices, that induce or pass current through the body, can be checked as a possible source of artifact by turning them off while obtaining the diagnostic ECG waveforms on this device.

- **Caution: Network failure.** The Q-Tel RMS system monitors network connections and notifies the user via a message window if a network failure is detected. If a network issue causes a Q-Tel RMS Workstation to be disconnected from the Q-Tel RMS Towers, the Workstation will cease to be functional. Immediately check the system network, and correct any dislodged network plugs, power-down conditions or other failures. Re-establishing the network connection and any needed link within a few minutes of the failure will allow activities in Patient Information and Charting and Editing to continue without shutting down and restarting the Q-Tel RMS Workstation application.

- **Caution: Session storage at capacity.** Sessions that are stored to the hard drive will cause the device to fill over time. Each hour-long exam session with full disclosure data will use approximately 12 MB of storage. Over time the Q-Tel RMS database will fill with patient data. See the Purge and Archive section for instructions on maintaining system performance and allowing for continued storage of new session data.

Electrical Safety

The electrical safety of this product has been considered in its design and production. Welch Allyn medical products are designed to comply with applicable national and international electrical codes.

- **WARNING! Shock hazard.** Do not use spray on liquid cleaners/aerosol cleaners. Only use damp cloth for cleaning.
- **WARNING! Possible injury or system damage.** The product should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
- **WARNING! Shock hazard.** Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock.
- **WARNING! Electrical hazard.** Do not connect additional multiple portable socket outlets (outlet strips) or extension cords to the Q-Tel RMS system.
- **WARNING! Electrical hazard.** Use only the medical grade power cords supplied with your system. Plug the system only into a grounded power outlet.
- **WARNING! Power cords and system cables.** Do not allow anything to rest on the power cord or cables. Do not locate this product where persons will or can walk or trip on the cord or cables.
- **WARNING! Power cords and system cables.** Do not let the cables get caught in the treadmill or other exercise device mechanism.
- **WARNING! Patient protection.** The Q-Tel RMS equipment was not designed to be used in the environment where the patient is undergoing a medical procedure as defined in IEC 60601-1-1 (1.5 m from the patient). The use of an isolation transformer between mains and Q-Tel RMS is required but is not a sufficient safety measure for use in the patient environment because of data connections (antenna network, data network) that might cause excessive leakage currents in some conditions. Additional separation devices may be required. Any equipment that has a physical connection between Q-Tel RMS and that is in the patient environment (e.g. laser printer and any powered components) must have additional protection against electrical shock (e.g., an Isolation Transformer and/or a separation device between the equipment and Q-Tel RMS) in order to be in compliance with IEC 60601-1 or equivalent safety standards.
- **WARNING! Possible improper system performance.** Do not connect items that are not specified as part of the Q-Tel RMS system to a Q-Tel RMS Tower or Workstation. Set up the Q-Tel RMS Tower or Workstation as described in the installation instructions and maintain that configuration.
- **Caution: Electrical hazard.** The maximum permitted load for the optional isolation transformer used with the system is 900VA.
- **Caution: Electrical hazard.** The Main Power Source / Isolation Transformer should be plugged into a dedicated power line to ensure that the primary power to the Q-Tel RMS computer is not subject to power sags induced by other devices.

Improper Software Use

The system must be dedicated to the task of monitoring and recording parameters during rehabilitative sessions. You can compromise the ability of the machine to perform its job by running improper software (for example, games, screensavers, etc.) that is not qualified and tested to run with the Q-Tel RMS software and that uses resources needed for the monitoring and session entry process.

- **WARNING! Requires computer knowledge.** Users must be trained in the use of a PC and capable of recognizing abnormal PC behavior.

- **WARNING! Audible alarms.** Do not use the system to play CDs or DVDs as the sound may mask an audible alarm.

- **WARNING! Patient safety.** Do not alter the software. Do not add or run other software programs on the Q-Tel RMS Tower or Workstation computer (except for Norton or McAfee anti-virus software), especially while monitoring patients. Any unauthorized change or addition may affect patient safety or efficacy. Other software can reduce disk space and available memory; it also can change configuration files.

- **WARNING! Possible improper system performance.** Do not load unqualified software on the machine. Unqualified software can compromise the safety of your patient and the accuracy of the tests.

- **Caution: Safeguards for patient information.** The facility is responsible for ensuring appropriate safeguards are put in place to protect patient health information (PHI). This includes a mixture of physical and IT-based mechanisms to secure PHI from unauthorized access. Examples include:
  - Physically securing computers or securing access to them.
  - Ensuring strong passwords are used, especially on mobile equipment.

- **Caution: Computer virus protection.** Do not use removable media that have been used on other PCs. They can introduce computer viruses with destructive effects on the software and data.

Operator Notes

All screen shots are for reference only. The screen displays differently depending on the system configuration.

At the end of each day, close the Q-Tel RMS application. If you do not close the application at the end of the day, you cannot admit patients to sessions the following day until you close and re-open the Q-Tel RMS application. It is also recommended to turn off the computer, particularly in areas or times of unstable AC power.

- **WARNING! Read this manual carefully.** The operator must be thoroughly familiar with the information in this manual before using the equipment.
- **WARNING! Review system findings.** Any notification or abnormal indication displayed by this system should be reviewed by skilled staff.
- **WARNING! Audible alarms.** The speakers must remain connected to the system at all times. Disconnecting the speakers can cause a system fault and can prevent you from hearing audible alarms.
- **WARNING! Remote usage.** When working on a Q-Tel RMS system located remotely away from the patient, do not use (exercise related) session management features or discharge a patient.
- **Caution: Powering off.** You must perform standard Windows shutdown procedures when you turn off the computer or the Q-Tel RMS software can become inoperable. See Powering Off the Computer.

> ***NOTE:*** *The Q-Tel RMS application requires the user to be a member of the local Power Users or Administrators group to run. Other components of the Q-Tel RMS, including the Backup/Restore, Configuration, Session Recovery, Import/Export and Purge/ Archive utilities, can be used only by users that are members of the local Administrators group.*

S2 Transmitter Restrictions

Some countries regulate the use of transmitter channel frequencies. These restrictions are outlined below for the United States with declared channels for 802.11a/b/g/n wireless protocols by the Federal Communications Commission (FCC).

- 2.4 GHz: Channels 1 - 11
- 5 GHz U-NII-1: Channels 36, 40, 44, and 48
- 5 GHz U-NII-2: Channels 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 18, 132, 136, and 140
- 5 GHz U-NII-3: Channels 149, 153, 157, 161, and 165

Optimal channels for the particular facility are identified during a site survey.

Indications for Use

The indications for use of the Q-Tel RMS system is the acquisition and transmission of ECG data by means of a radio frequency transmitter worn by individual patients in a hospital or clinical setting, to a central monitor where it is received, displayed, stored, and analyzed. The system alerts the user to heart rate and arrhythmia in the patient. The intended populations are ambulatory adults where cardiac monitoring is prescribed while undergoing exercise rehabilitation. Patient demographics, exercise prescription, and collected data can be exported to an outcomes management program.

Intended Use

- The device is intended to acquire and transmit electrocardiograph (ECG) data by means of a radio-frequency transmitter worn by individual patients in a hospital or clinical setting to a central monitor where it is received, displayed, stored, and analyzed, with alarms for heart rate, arrhythmia, and ST change.
- The device is to be used on ambulatory adult populations where monitoring is prescribed while undergoing exercise rehabilitation.
- Multiple central receivers may be used and connected to a local area network.
- Specified wireless data entry devices may be connected to the system via a wireless access point and be used as a station for entry of patient session data.
- Optional workstation(s) may be connected to the system via a network for entering and viewing patient demographic and rehab session data. The workstation may also be used for tracking patient progress in cardiac rehab and displaying non-real-time waveforms and alarms.
- Patient demographics, exercise prescription, scheduling information, and collected data can be ported to an outcomes management program.

EQUIPMENT SYMBOLS AND MARKINGS

Symbol Delineation

Welch Allyn products display one or more of these symbols and warning labels for your protection.

	WARNING The warning statements in this manual identify conditions or practices that could lead to illness, injury, or death. In addition, when used on a patient applied part, this symbol indicates defibrillation protection is in the cables. Warning symbols will appear with a grey background in a black and white document.		
	CAUTION The caution statements in this manual identify conditions or practices that could result in damage to the equipment or other property, or loss of data.		
	Follow instructions/directions for use (DFU) -- mandatory action. A copy of the DFU is available on this website. A printed copy of the DFU can be ordered from Welch Allyn for delivery within 7 calendar days.		Replace fuse only as marked
	Earth ground (protective)		Fuse
	Off (power disconnected from mains)		Mains power
	On (power connected to mains)		Equipotentiality
	Type B equipment – provides adequate protection against electric shock, particularly regarding allowable leakage current; reliability of the protective earth connection (when present)		Type BF equipment – contains an F- type isolated patient applied part providing a high degree of protection against electric shock
	Type BF equipment with defibrillation protection		Input/output
	Do not dispose as unsorted municipal waste. Requires separate handling for waste disposal according to local requirements	**Hz**	Hertz
	Type CF equipment – contains an F type isolated patient applied part and provides a degree of protection against electric shock higher than that for type BF equipment regarding allowable leakage currents		Type CF equipment with defibrillation protection
	Alternating current	**A**	Amperes

T	Timed fuse (slo-blo)		High voltage
V	Volts		Earth ground (functional)
VA	Volt Amperes	MD	Medical Device
REF	Reorder Number	#	Model Identifier

GENERAL CARE

Keep system components clean. Perform preventive maintenance as needed and at least semi-annually. For information on general cleaning and maintenance of Q-Tel RMS components see *Maintenance*.

Refer to the Q-Tel RMS Service Manual, part number 8025608, for detailed cleaning and maintenance instructions.

Disposal

This product and its accessories must be disposed of according to local laws and regulations. Do not dispose of this product as unsorted municipal waste. For more specific disposal information see www.welchallyn.com/weee.

ELECTROMAGNETIC COMPATIBILITY (EMC)

Guidance and Manufacturer's Declaration: Electromagnetic Emissions

The equipment is intended for use in the electromagnetic environment specified in the table below. The customer or the user of the equipment should ensure that it is used in such an environment.

Emissions Test	Compliance	Electromagnetic Environment: Guidance
RF Emissions CISPR 11	Group 1	The Q-Tel RMS system uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF Emissions CISPR 11	Class A	The Q-Tel RMS system is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic Emissions IEC 61000-3-2	Class A	
Voltage Fluctuations/ Flicker Emissions IEC 61000-3-3	Complies	

Guidance and Manufacturer's Declaration: Electromagnetic Immunity

The equipment is intended for use in the electromagnetic environment specified in the table below. The customer or the user of the equipment should ensure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance Level	Electromagnetic Environment: Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	+/- 6 kV contact +/- 8 kV air	+/- 6 kV contact +/- 8 kV air	Floors should be wood, concrete, or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	+/- 2 kV for power supply lines +/- 1 kV for input/output lines	+/- 2 kV for power supply lines +/- 1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	+/- 1 kV differential mode +/- 2 kV common mode	+/- 1 kV differential mode +/- 2 kV common mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% UT (>95% dip in UT) for 0.5 cycles <40% UT (>60% dip in UT) for 5 cycles <70% UT (>30% dip in UT) for 25 cycles <5% UT (>95% dip in UT) for 5 sec	<5% UT (>95% dip in UT) for 0.5 cycles <40% UT (>60% dip in UT) for 5 cycles <70% UT (>30% dip in UT) for 25 cycles <5% UT (>95% dip in UT) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the equipment requires continued operation during power mains interruptions, it is required that the equipment be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.

NOTE: *UT is the AC Mains voltage prior to application of the test level.*

Guidance and Manufacturer's Declaration: Electromagnetic Immunity

The equipment is intended for use in the electromagnetic environment specified in the table below. The customer or the user of the equipment should ensure that it is used in such an environment.

<table>
<tr><th>Immunity Test</th><th>IEC 60601 Test Level</th><th>Compliance Level</th><th>Electromagnetic Environment: Guidance</th></tr>
<tr><td>Conducted RF
EN 61000-4-6</td><td>3 Vrms
150 kHz to
80 MHz</td><td>3 V[c]</td><td rowspan="2">Portable and mobile RF communications equipment should be used no closer to any part of the equipment, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.

Recommended separation distance

d = 1.2 $\sqrt{P}$ 150 kHz to 80 MHz

d = 1.2 $\sqrt{P}$ 80 MHz to 800 MHz

d = $\sqrt{P}$ 800 MHz to 2.5 GHz

Where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m).

Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey[a], should be less than the compliance level in each frequency range[b].

Interference may occur in the vicinity of equipment marked with the following symbol:

  </td></tr>
<tr><td>Radiated RF
IEC 61000-4-3</td><td>3 V/m
80 MHz to
2.5 GHz</td><td>3 V[c]</td></tr>
</table>

NOTE: *At 80 MHz and 800 MHz, the higher frequency range applies.*
NOTE: *These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.*
NOTE: *Tests were verified with shielded input/output cables only.*

a. Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radios, AM and FM radio broadcast, and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the equipment is used exceeds the applicable RF compliance level above, the equipment should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the equipment.

b. Over the frequency range 150 kHz to 80 MHz, field strengths should be less than [3] V/m.

c. Amplitude modulated at 80% with a modulation frequency of 10 KHz per En 60601-2-25.

Recommended Separation Distances Between Portable and Mobile RF Communications Equipment and the Equipment

The equipment is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the equipment can help to prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the equipment as recommended in the table below, according to the maximum output power of the communications equipment

Rated Maximum Output Power of Transmitter (W)	Separation Distance According to Frequency of Transmitter (m)		
	150 KHz to 80 MHz	80 MHz to 800 MHz	800 MHz to 2.5 GHz
	$d = 1.2 \sqrt{P}$	$d = 1.2 \sqrt{P}$	$d = 2.3 \sqrt{P}$
0.01	0.12 m	0.12 m	0.23 m
0.1	0.38 m	0.38 m	0.73 m
1	1.2 m	1.2 m	2.3 m
10	3.8 m	3.8 m	7.3 m
100	12.0 m	12.0 m	23.0 m

For transmitters rated at a maximum output power not listed above, the recommended separation distance *d* in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where *P* is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

NOTE: *At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.*

NOTE: *These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.*

INTRODUCTION

This chapter contains introductory information for using the Q-Tel RMS application.

User Profile

The Q-Tel RMS system is intended for use in a clinical setting by trained personnel who are acting on the orders of a physician. See *User Safety Information* for important safety information. The final decision regarding the treatment of patients is the responsibility of the physician.

Caution: Restricted use.
Nurses, clinicians, technicians, and other users must be familiar with clinical procedures surrounding ECGs in cardiac rehabilitation and trained in the use of a PC before using the equipment.

Failure to follow the conditions set forth below shall limit, to the extent allowed by law, the responsibility of Welch Allyn for the safety, reliability, and performance of this equipment.

This user manual must be read in full by each operator before using the product for the first time.

Assembly operations, extensions, readjustments, modifications, or repairs must be carried out only by Welch Allyn trained or authorized personnel.

The electrical wiring within the instrument's setting and the electrical installation of the instrument must comply with the applicable local or provincial requirements.

The equipment must be used in accordance with the instructions for use.

Overview of System

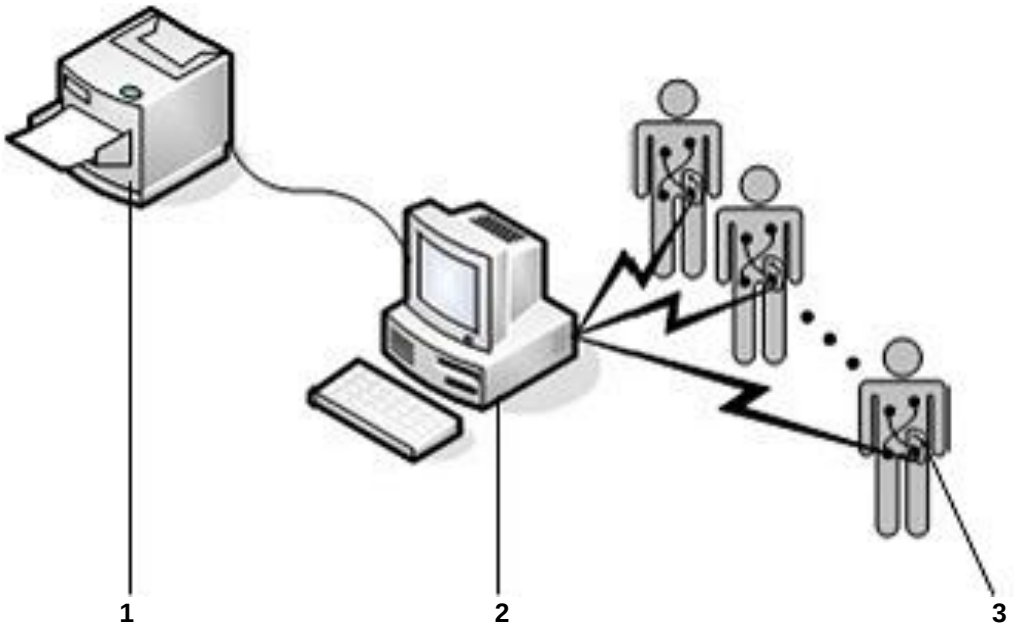
The Q-Tel RMS system is a computer-based cardiac and pulmonary rehabilitation data acquisition and editing system. It provides rehabilitation functionality using telemetry units that transmit patient ECG signals to a PC platform running the Microsoft Windows 10 operating system.

The primary functions of the system are:
- ECG monitoring
- Reporting of data and analysis of results.

The Q-Tel RMS system also maintains a database that contains complete rehabilitation case records.

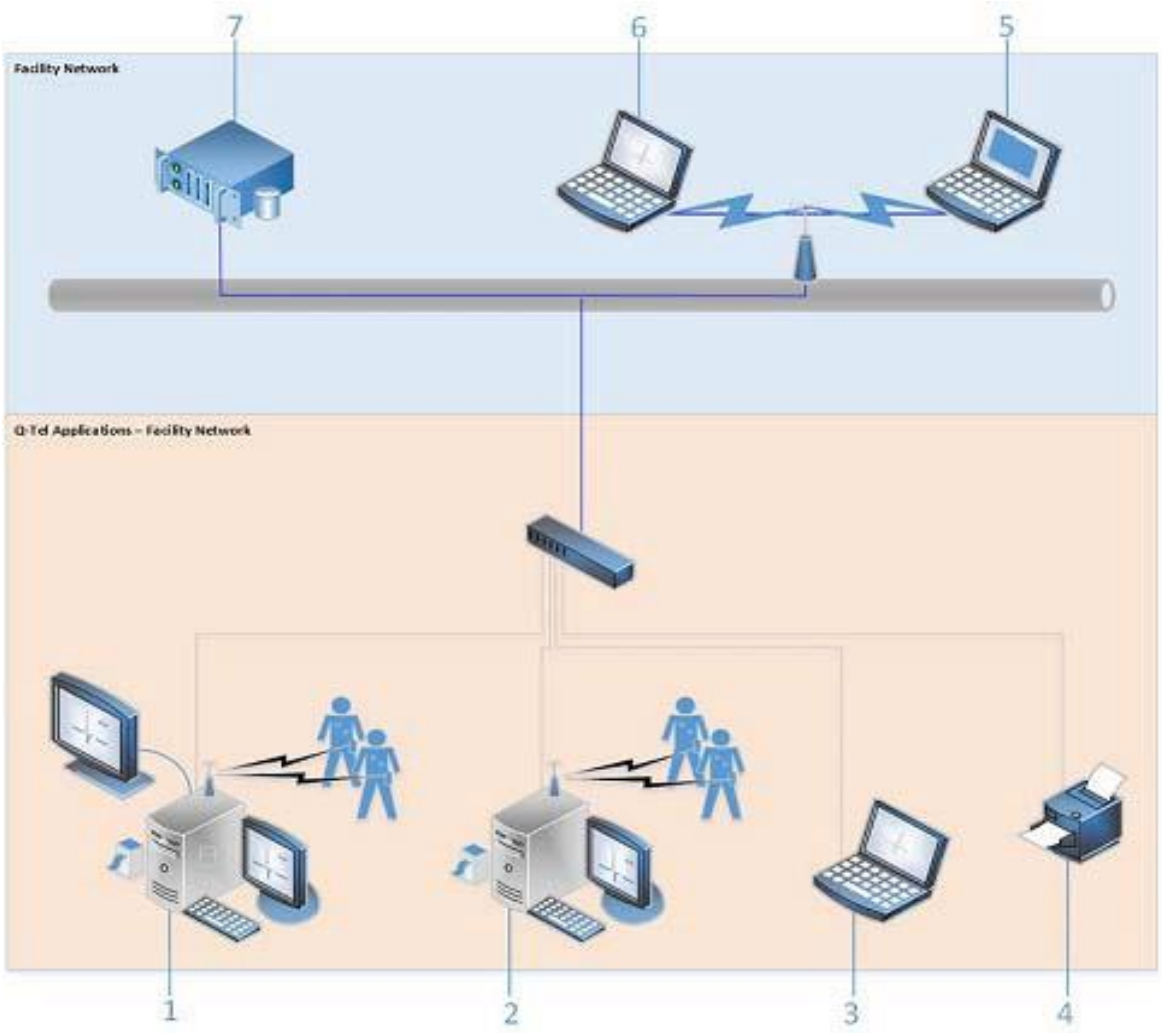
Q-Tel RMS is scalable from a single tower monitoring (for example) 4 patients (Figure 1) up to a larger network monitoring up to 32 patients (Figure 2).

Figure 1 Single Tower System



1	Laser Printer
2	Rehab Monitor Tower
3	Wi-Fi Transmitter

Figure 2 Networked System Concept



1	Q-Tel RMS Main Tower	6	Q-Tel RMS Software Workstation
2	Q-Tel RMS Secondary Tower	7	Facility Server
3	Q-Tel RMS Turnkey Workstation		
4	Q-Tel RMS Laser Printer		
5	Q-Tel RMS Q-Progress Workstation		

System Configuration and Settings

Windows is configured for optimum performance of Q-Tel RMS. Changing the settings can affect the performance. Q-Tel RMS disables screensavers.

It is recommended that all Q-Tel RMS systems be periodically updated with Microsoft critical and security updates to protect their system from malware attacks and to fix critical Microsoft software issues. The following guidelines apply for Microsoft updates;

- Customer is responsible for applying Microsoft Updates
- Configure Microsoft updates to be ***manually*** applied
- Do not install Microsoft updates during use of the product
- After installing updates, verify proper system operation before monitoring patients

Each Q-Tel RMS product release is tested against the cumulative Microsoft updates at the time of product release. There are no known Microsoft update conflicts with the Q-Tel RMS application. Please contact Welch Allyn Technical Support if conflicts are identified.

Workstation Configurations

This document describes the operation of the Q-Tel RMS software for both the tower and software workstations. However, statements and claims within this document specific to computer software and hardware components apply only to those components purchased from Welch Allyn. If a component has been purchased from a different vendor, consult the vendor documentation for proper operation and use.

If you use the workstation software option, you are responsible for purchasing the hardware that meets the specifications as set by Welch Allyn. See *Workstation Software Specifications*.

Function

The Q-Tel RMS system measures the electrical activity of a patient's heart during exercise and transmits it via Wi-Fi to a central monitoring station. The monitoring station displays the patient's concurrent, real-time ECG waveforms and uses programmable alarms to indicate the presence of arrhythmias. When alerted by the alarm, the clinician can determine whether the event causing the alarm is benign or clinically significant. The Q-Tel RMS system enables the clinician to view, edit, and record ECG strips and print tabular reports.

Basic Terms and Operations

This section describes basic terms and conventions used in this manual.

Conventions Used in this Manual

Most actions can be accomplished by using the mouse or by pressing keys on the keyboard.

When directions call for you to click on an item shown on the screen, the item is bold in the text. For example, *Click **Yes** to continue* indicates you should move the mouse cursor over the **Yes** button on the screen and press the left mouse button.

The symbol | between words indicates a sequence of commands. For example, to start the Q-Tel RMS program using the Start menu: **Start** | **Quinton** | **Q-Tel RMS Tower** indicates you click **Start**, in the new window click **Quinton**. When the system displays **Q-Tel RMS Tower** click the menu item.

Product Features

Q-Tel RMS features are:

Feature	Description
Telemetry monitoring	Concurrent monitoring of rehab patients using WiFi telemetry for ECG transmission
	Concurrent monitoring of rehab patients using Wi-Fi telemetry for patient data feedback to the transmitter from Q-Tel RMS
	Display of real-time ECG signals for up to 12 patients on a single display monitor.
	Support for independent exercise prescriptions for each monitored patient.
	Continuous heart rate measurement and display.
	Continuous arrhythmia analysis with alarms.
ECG	Selectable display lead and gain.
	Sweep speed of 25 mm/sec.
	Optional waveform grid.
Vital Signs	Ability to enter NIBP, SpO2, and other user-defined parameters for each patient.
User Interface	Standard Windows GUI with deviations as required.
	Keyboard, mouse.
Database	Full disclosure of up to 5 leads for each monitored patient for up to four hours, three most recent sessions.
	Backup capabilities for all Q-Tel RMS data, including full disclosure.
	Archive of patient demographic data, session parameters, and associated PDF session reports.
Clocks and Timers	Independent exercise prescription timer for each monitored patient.
Printing and Reporting	Laser printer for printing ECG strips of one or two leads
	Laser printer for printing comprehensive reports.
	Vital signs trending (through Q-Progress software).

Product Components

A Q-Tel RMS system consists of Towers, Workstations, telemetry units, and printers.

Towers and Workstations

A Q-Tel RMS system consists of at least one "Main" Tower, and optional Secondary towers. Towers admit patients for monitoring. The Main tower includes the Q-Tel RMS database. The optional Secondary Towers and Workstations use the database that resides on the Main Tower. Both the Main Tower and the Secondary Towers can serve as rehab monitors and administrative workstations.

Workstation software can be ordered as a Turnkey Workstation (configured with software and hardware), or be installed on customer supplied equipment. Workstations include similar session management capabilities as the Tower(s).

Review workstation software is supplied without the Session Management license capabilities. It is installed on customer supplied equipment.

Workstation Functions

Function	Turnkey	Workstation S/W	Review
Enter rehab patient information	X	X	X
Edit session data in charting and editing	X	X	X
View ECG waveforms in non-real-time	X	X	X
Generate reports	X	X	X
Take control of session data for patients admitted to active sessions	X	X	
Edit Session Management information	X	X	

Workstations without session management do not permit control of patients admitted to active sessions and all Session Management functionality is read-only.

Q-Tel RMS Tower and workstations include:

Tower and Workstation Components

Function	Q-Tel RMS Tower	Q-Tel RMS Turnkey Workstation	Q-Tel RMS Review Workstation
Proprietary Q-Tel RMS software	X	X	X
A basic computer including the CPU, monitor, mouse, and keyboard	X	X	
Telemetry electronics for the reception of the ECG signals from the patient worn transmitters	X		
Speakers	X	X	

Telemetry Unit

The telemetry unit consists of lead wires and a transmitter. The unit supports the transmission of four and five lead ECG data with electrode clips or snaps marked with AHA or IEC lead identifiers. It provides ECG data at a rate of 500 samples per second per channel.

The S2 telemetry unit supports bidirectional data transfer. ECG data is sent to Q-Tel RMS. The Q-Tel RMS sends connection status information, patient demographics and heart rate to the telemetry unit. The bidirectional data flow is encrypted to reduce any risk-related personal health information (PHI) violation by unauthorized individuals.

Refer to the S2 Transmitter User manual (9515-210-50-ENG) for details and information about the S2 Transmitter.

Printers

The Q-Tel RMS system supports a laser printer.

WARNING! Patient Protection.

Do not connect the printer directly to the Main tower. Instead, connect the printer via a network connection in order to comply with the IEC60601-1 standard.

Laser Printer

The laser printer produces full-page reports on 8 ½ by 11-inch paper and supports text, graphics, and waveforms. It prints with a minimum resolution of 600 dpi in both horizontal and vertical directions to support quality ECG data.

The laser printer can also be used to print ECG strips of up to two channels scaled at 25mm/sec.

Uninterruptible Power Supply (UPS)

The Q-Tel RMS system requires a steady supply of power during its operation. If power failures or brownouts are a problem in the area, purchase a line conditioner or use the UPS provided with the tower to ensure optimal operation of the system. The computer, monitor, and speakers can be plugged into the UPS.

Caution: Possible improper system performance.

Do not plug the laser printer into the UPS with the other Q-Tel RMS components.

UPS requirements differ based on the AC voltage available with the system.

Starting the Application

Use the instructions in this section to power on the Q-Tel RMS system.

Caution: Possible improper system performance.

If running a networked Q-Tel RMS system, make sure the Q-Tel RMS Main Tower is powered on and running before starting the Q-Tel RMS application on Secondary Towers or Workstations.

To start the Q-Tel RMS application:

1. Choose a method to start the application:
   - From the desktop of the Q-Tel RMS tower, double-click on the **Q-Tel RMS Tower** icon.
   - From the desktop of the Q-Tel RMS workstation, double-click on the **Q-Tel RMS Workstation** icon.
   - From the Start menu, click on **Start | Quinton | Q-Tel RMS Tower.**

   The logo screen displays:

2. Select the first screen to access.

   NOTE: *You can turn off the selection window and proceed directly to the configured default window on the Main and Secondary Towers only.*

   On a Q-Tel RMS Tower, the system also displays an Alarm Volume Test dialog box.

WARNING! Audible alarms.
The alarm test is included at the start of the Q-Tel RMS program on the Tower to ensure that the audio alarms are properly functioning. The alarms do not function properly if the speakers have been unplugged, if the volume has been turned down on the speakers or in the Windows Control Panel, or if there has been a component failure. It is very important to ensure proper function of the alarms before starting a patient monitoring session.

3. On the Q-Tel RMS Tower, respond to the alarm dialog box:
   - Click **Yes** if you heard the alarm sound.
     The Q-Tel RMS program screen displays.
   - Click **No** if you did not hear the alarm.
     The Q-Tel displays a dialog box. Check the volume control and make sure the speakers are plugged in and functioning.

   For more information on alarms, refer to *Alarm Subsystem*.

4. If there are patient files available for importing, the system prompts you to import the files.
   - Click **Yes** to open the Import files window.
   - Click **No** to import the files later.

   For more information on importing files see *Importing Patient Files*.

Powering Off the Computer

When you have completed testing for the day, use this procedure to power off the computer.

Caution: Possible improper system performance.
If you power down the Q-Tel RMS computer before performing these steps, you can cause the Q-Tel RMS software to become inoperable.

NOTE: *If running in a networked Q-Tel RMS configuration, you must close the Q-Tel RMS application on all other Q-Tel RMS Towers and Workstations before shutting down the Main Tower.*

NOTE: *You must discharge all patients before closing the Q-Tel RMS application.*

To power off the system:

1. Choose a method to close the application:
   - Click the **X** in the upper right corner of the screen.
   - Select **File | Exit**.
2. Select **Start | Shut Down** from the Windows task bar. The system displays a confirmation dialog box.
3. Select **Shut down the computer** and then click **Yes.** The system automatically powers off when Windows completes the shutdown process.
4. If the system does not power off after the shutdown is complete, press the power button on the front of the computer to power the system off.

SYSTEM SETUP

This chapter contains the reference instructions for configuring the Q-Tel RMS transmitter.

Hardware Setup

Refer to the *Q-Tel RMS Installation Instructions* (9515-193-60), provided with your Q-Tel RMS system for complete instructions on how to set up the system. You will typically only do this once.

In addition, the *Functional Block Diagram* depicts the general connectivity of the Q-Tel RMS Tower components.

Configuring the Transmitters

The Q-Tel RMS system at software version 5.0.1 supports the Welch Allyn S2 Telemetry Transmitter.

Configuring the S2 Transmitters

The Q-Tel RMS transmitters are light-weight battery-operated units powered by a rechargeable lithium battery that connects to tower systems through a WiFi network.

Patient cables support both 4-leads and 5-leads for multi-channel ECG acquisition.

The S2 transmitter is powered by a rechargeable lithium battery.

Refer to the S2 Transmitter User manual (9515-210-50-ENG) for configuring and using the S2 Transmitter.

***WARNING**: The 3-lead patient cable configuration is not supported and will display square waves at Q-Tel RMS if configured with the 3-wire cable connected to the S2 transmitter.*

Patient Preparation

Electrodes must be placed correctly to acquire a successful trace. Consider performing procedures to remove oils, lotions, and hair from the skin, particularly on obese individuals.

Poor skin-electrode contact can cause noise or artifact that can affect the analysis of the ECG data. Low amplitude signals can also be the result of poor skin-electrode placement.

Refer to the S2 Transmitter User manual (9515-210-50-ENG) for patient preparation and lead placement.

Lead fail

When all electrodes are in failure mode, the “ALL FAIL” message is shown. Otherwise, the name of the electrode in failure is specifically shown.

Refer to the S2 Transmitter User manual (9515-210-50-ENG) for instructions to check ECG electrode and lead wire signal quality.

PATIENT INFORMATION

The Q-Tel RMS Patient Information component includes:

- Basic patient demographic information such as name and address
- A place to record clinical long-term goals for patient outcomes tracking
- Support to design the best rehab program for the patient's diagnoses and risks

This chapter describes data entry for each Patient Information screen. When you open the Q-Tel RMS program, the Patient Information screen displays.

> ***NOTE:*** *If you have a networked Q-Tel RMS, refer to Network Operation and Workstation Capabilities for network specific functions related to the Patient Information component.*

> ***NOTE:*** *Use the* ***Close Patient*** *button to broadcast any changes to the patient record, to other computers. This is especially useful for patient prescriptions.*

Accessing Patient Information

To access the Patient Information screen:

- Click the **Patient Info** button.

The **Patient Search** screen displays. Tabbed sections contain information specific to the patient and carry through the patient's entire program.

To activate the tabbed sections, select an existing patient or enter a new patient (see *Adding A New Patient*).

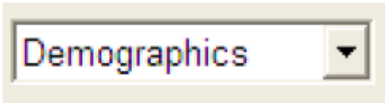
Patient Information

Use the **Patient Information** screen to view and edit all information that describes the patient or that might be pertinent to the rehabilitation program. Items that are grayed out cannot be used on the current screen.

The main tool bar contains these icons:

Patient Information Icons

Icon	Label	Description
	Patient Info	Displays the Patient Information screen.
	Session Management	Displays the Session Management screen.
	Charting and Editing	Displays the Charting and Editing screen.

Icon	Label	Description
	Not applicable	Icon is greyed and unavailable for selection.
	Silence Alarm	Turns off the sound for the active alarm. Only active if an alarm is active. Disabled if no alarms are currently sounding.
	Run Report	Prints the report to the selected location. Options are: • Printer • Acrobat/PDF
 Report Type		Selects the report type. Options are: • Demographics • Prescription
	Admin Reports	Prints the Administrative reports.

When the Patient Information screen is enabled, the system displays additional tabs. Each tab uses the conventions listed in the Conventions table.

Conventions

Convention	Description
Required Fields	Fields that are annotated with a single asterisk (*) are required. The system does not save the data if a required field is blank.
System Required Fields	Fields that are annotated with a double asterisk (**) are required. The system automatically generates a unique entry if the field is blank.
Saving Data	The system automatically saves the patient information when you navigate from one tab to another or from the Patient Information screen to another screen. To cancel changes, re-enter valid data.

Printing A Demographics Report

Use the report type field to select a report.

***NOTE**: To print a prescription see Printing A Prescription.*

To print a demographics report:

1. Select **Demographics** from the report type menu.
2. Select the destination:
   - **Printer**—to send the report to a printer.
   - **PDF**—to store the report in the Adobe PDF format.
3. Click the **Run Report** button to generate the report.
   - On a Standalone Tower, PDF formatted reports are stored in this folder:
     `C:\Program Files\Quinton\QTel RMS\Patient_Reports.`
   - For a networked Q-Tel RMS configuration, PDF formatted reports are stored in this folder on the Main Tower:
     `C:\QTelDataCenter\Patient_Reports.`

Patient Query Report

Use the Patient Query report to search for patients based on various session information and create a customized patient demographics report.

To create a list of patients:

1. Click **Admin Reports**.
2. Select **Patient Query** from the list of reports.
3. Enter the patient query information:

Field	To search for…
Active	Patients that are currently active, select **Yes**. Patients that are not active, select **No**.
Program	Patients from the selected program.
Gender	Patients of the selected gender.
Monitored	Monitored patients, select **Yes**. Non-Monitored patients, select **No**.
Medication Name	Patients using the selected medication.
Enrollment Date	Patients that were enrolled within the selected date range.
Last Session Date	Patients whose last session is within the selected date range.
Program Completion Date	Patients whose program was completed within the selected date range.
Weight	Patients within the entered weight range.
Age	Patients within the entered age range
# of Billable Sessions	Patients with the entered range of billable sessions.
# of Non-Billable Sessions	Patients with the entered range of non-billable sessions.
Insurance	Patients with the selected Primary and/or Secondary insurance carrier.
Physician	Patients in the care of the selected Primary physician and/or specialist.
Diagnoses	Patients with the selected primary and/or secondary diagnosis.
Risk Factors	Patients with the selected combination of risk factors.

4. Click **Query Patients**. The list of patients that match the query criteria display on the right side of the screen.

To	Do this…
Create a new patient query report using different search parameters	Click **Change Query Criteria**.
Send to a printer	Click **Print**.
Save as a PDF	Click **Save**. On a Standalone Tower the system stores PDF files in the folder: C:\Program Files\Quinton\QTel RMS\AdminReports For a networked Q-Tel RMS configuration, PDF files are stored in this folder on the Main Tower: C:\QTelDataCenter\AdminReports.
Preview the query report	Click **Preview**. The system displays the report preview screen. For more information see *Report Preview*.

Patient Search Tab

Use the patient search functionality to locate a specific patient. The patient search section displays on several screens. The area to the left of the screen displays fields for the selected patient.

Searching For A Patient

To search for a specific patient:

1. If **Search for Patients** is not visible, select the **Patient Search** tab.

To Search for:	Do this…
All patients (including patients that have completed their rehab program)	1. Click List All. 2. Uncheck Active Patients Only. 3. Click **Search**. For information on completed programs, see *Program Tab*.
All active patients	1. Click List All. 2. Check Active Patients Only. 3. Click **Search**.
Patients by last name	1. Click List by Last Name. 2. Enter at least the first letter of the patient's last name in the text box. To narrow the search, enter more of the last name. 3. Click **Search**.
Patients by MRN	1. Click List by MRN. 2. Enter one or more characters of the MRN. To narrow the search, enter more characters. 3. Click **Search**.
All Monitored or All Non-Monitored Patients	1. Select the check box for Phase. 2. Select a phase condition (monitored or non-monitored) from the Phase menu. 3. Click Search.

The system displays a list of patients matching the search criteria.

2. Scroll down the list to locate the specific patient.

Editing Existing Patients

Use the **<<Edit Patient** button to change information about the patient.

> ***NOTE:*** *To open the* ***Patient Info*** *tab, double-click anywhere on the patient line, except the* ***Export*** *column.*

To edit a patient:

1. Click on the patient to edit. If the patient is not displayed, see *Patient Search Tab* to locate the patient.
2. Click on the **Edit Patient** button. All of the patient tabs are available. The **Patient Info** tab opens and information for the current patient displays on the left of the screen.

Adding A New Patient

Use the **New Patient** button to enter information for a new patient. To enter a new patient into the system:

1. Click the **New Patient** button. The **New Patient** tab displays.
2. Enter the new patient information.

> ***NOTE:*** *Be sure to select the correct program. Changing the program assignment causes the system to delete session and ECG data for completed sessions.*

3. Select whether the patient is monitored (Phase II) or non-monitored (Phase III) from the **Phase** menu.
4. Select **OK**. All of the patient tabs are available. The **Patient Info** tab opens and information for the current patient displays on the left of the screen.

Patient Search Fields

Fields	Description
<<Edit Patient	This button displays the Patient Info tab.
New Patient	This button displays the New Patient tab.
Close Patient	This button releases the active patient so another patient can be selected.
Refresh List	This button updates the list with changes. For more information on Refresh, see *Additional Features in Patient Information*.
Export Data	This button exports the selected patients.
Select All Patients	When checked, all patients are selected for export.
Patient	Displays the patient name. Use the Patient Info tab to edit.

Fields	Description
MRN	Displays the patient MRN.
Completed	The number of sessions completed for the patient.
Approved	The number of sessions the patient's insurance has approved for the patient.
Export	When checked the patient is marked for export.
Search for Patients List All	When selected, the system searches for all patients.
List by Last Name	When selected, the system searches by patient last name. Enter the search criteria in the text box.
List by MRN	When selected, the system searches by the MRN. Enter the search criteria in the text box.
Text Box	Text box for search criteria.
Phase	When selected the system searches only for patients with the selected phase. Select the phase from the drop-down menu. • **Phase II (Monitored)** • **Phase III (non-Monitored)**
Active Patients Only	When selected the system searches only active patients.
Search	This button activates the search based on the selected criteria.

New Patients Fields

Fields	Max Length	Description
Last Name*	50	Required field. Patient's last name.
First	50	Patient's first name.
MRN**	25	Required field. The system generates an entry if this field is left blank. MRN (Medical Record Number) uniquely identifies the patient.
Program *		The type of rehabilitation program. Select the program from the drop-down menu. • **Cardiac** • **Pulmonary**
Phase		Indicates the type of patient monitoring. Select the phase from the drop-down menu. • **Phase II (Monitored)** • **Phase III (non-Monitored)**

Patient Info Tab

Use the Patient Info tab to enter basic patient information.

NOTE: *Some displayed fields may be truncated.*

Fields	Max Length	Description
Last Name*	50	Required field. Patient's last name.
First	50	Patient's first name.
MI	1	Middle initial.
MRN**	25	Required field. The system generates an entry if this field is left blank. MRN (Medical Record Number) uniquely identifies the patient.
SSN	11	Social Security Number. Enter ###-##-#### or any 11 characters.
Date of Birth	--	The system automatically calculates age from date of birth (DOB).
Height	2	Height in inches. (**1-99**)
Weight	5	Weight in pounds. (**0-500.00**) This field is linked to the **Weight** parameter (see *System-defined Parameters*). Entering a weight in this field automatically updates all occurrences of the **Weight** parameter in this patient's prescription. Entering a value for the **Weight** parameter in the patient's prescription, either on the Patient Information **Rx** tab or in the activity grid during the patient's session, automatically updates this field.
Gender	--	Drop-down menu for the patient's gender.
Ethnicity	25	Drop-down menu for patient's ethnicity.
Address	50 per line	Two lines are available for the address.
City	50	The patient's city.
State	50	Drop-down menu for the state or province. (Use the Configuration Utility to edit).
Postal Code	10	The patient's zip code.
Country	50	Drop-down menu for the country. (Use the Configuration Utility to edit).
Account Number	40	Account number.
Home Phone	25	Contact information.
Work Phone	25	Contact information.
Cell Phone	25	Contact information.
Pager	25	Contact information.
Fax	25	Contact information.
E-mail	75	Contact information.
Order Number	40	Order number.

Insurance Tab

Use the Insurance tab to enter the patient's primary and secondary insurance carriers. The group, contact name and contact phone number are specific to the patient, not the insurance carrier. This accommodates patients with the same insurance carrier but different group IDs, offices or contacts for that carrier through their personal or company insurance plan. The primary and secondary insurance tabs are identical with respect to content and entry.

Caution: Possible data loss.

When changing the insurance carrier for a patient, use the **Clear** button to remove the old data and then enter the new data. Do not type over the existing carrier name unless you want to change the name throughout Q-Tel RMS.

The fields for the **Primary** tab and the **Secondary** tab are the same.

Fields	Max Length	Description
Select Carrier	--	Drop-down menu for the insurance carrier.
Clear	--	This button clears the screen. Use **Clear** to enter a new carrier without editing an existing carrier.
Carrier*	50	The patient's insurance carrier. Select from the drop-down menu or double-click to add a new entry. Modifying an existing carrier name changes the carrier name for all patients with the existing carrier. For example, selecting Carrier A and then editing it to Carrier B changes all instances of Carrier A to Carrier B.
Group	50	Insurance group number for the patient.
HICN	50	Health Insurance Claim Number for the patient.
Contact Name	50	Insurance contact.
Phone	25	Insurance phone number.

Billing Tab

Use the **Billing** tab to enter billing information. If the billing address is the same as the patient address on the **Patient Info** tab, the system can automatically copy the information.

To automatically enter patient information from the **Patient Info** tab:

Click **Copy Patient Address**.

Fields	Max Length	Description
Last Name*	50	Required field. Patient's last name.
First	50	Patient's first name.
MI	1	Middle initial.
Relationship	25	Drop-down menu for the relationship to the patient. Select from the drop-down menu or double-click to add a new entry.
Copy Patient Address	--	This button populates the fields using the data from the **Patient Info** tab.
Phase	--	System-generated.

Fields	Max Length	Description
CPT Billing Code	--	System-generated.
Address	50 per line	Two lines are available for the address.
City	50	The name of the city.
State	50	Drop-down menu for the state or province. (Use the Configuration Utility to edit.)
Postal Code	10	The zip code.
Country	50	Drop-down menu for the country. (Use the Configuration Utility to edit.
Home Phone	25	Contact information.
Work Phone	25	Contact information.
Cell Phone	25	Contact information.
Pager	25	Contact information.
Fax	25	Contact information.
E-mail	75	Contact information.

Physician Tab

A rehab patient typically has a specialist (for example, a cardiologist) as well as a primary physician. Use the **Physician** tab to enter information for both doctors.

Changing a physician's information for one patient, updates all patients with that physician selected.

Caution: Possible data loss.

When changing a physician for a patient, use the **Clear** button to remove the old data and then enter the new data. Do not type over the existing physician information unless you want to change the physician's information throughout Q-Tel RMS.

The fields for the **Primary** tab and the **Specialist** tab are the same.

Fields	Max Length	Description
Select Physician		Drop-down menu for the physician.
Clear		This button clears the screen. Use **Clear** to enter a new physician without editing an existing physician.
Last Name*	50	Required field. Physicians last name.
First	50	Physician's first name.
MI	1	Middle initial.
Provider ID	20	Identifier for the physician.
Address	50 per line	Two lines are available for the address.
City	50	The name of the city.
State	50	Drop-down menu for the state or province. (Use the Configuration Utility to edit.)

Fields	Max Length	Description
Postal Code	10	The zip code.
Country	50	Drop-down menu for the country. (Use the Configuration Utility to edit.)
Home Phone	25	Contact information.
Work Phone	25	Contact information.
Cell Phone	25	Contact information.
Pager	25	Contact information.
Fax	25	Contact information.
E-mail	75	Contact information.

Emergency Contact Tab

Use the **Emergency Contact** tab to enter contact information in case of a patient emergency. If the emergency information address/phone is the same as that for the patient, copy it by clicking on the **Copy Patient Address** button.

NOTE: *You must enter at least one phone number for an emergency contact.*

Fields	Max Length	Description
Last Name*	50	Required field. Contact's last name.
First	50	Contact's first name.
MI	1	Middle initial.
Relationship	25	Drop-down menu for the relationship to the patient. Select from the drop-down menu or double-click to add a new entry.
Copy Patient Address	--	This button populates the fields using the data from the **Patient Info** tab.
Address	50 per line	Two lines are available for the address.
City	50	The name of the city.
State	50	Drop-down menu for the state or province. (Use the Configuration Utility to edit.)
Postal Code	10	The zip code.
Country	50	Drop-down menu for the country. (Use the Configuration Utility to edit.)
Home Phone	25	Contact information.
Work Phone	25	Contact information.
Cell Phone	25	Contact information.
Pager	25	Contact information.
Fax	25	Contact information.
E-mail	75	Contact information.

Diagnoses Tab

Use the **Diagnoses** tab to record information about the patient's previous diagnoses. Enter any previous diagnoses and any secondary diagnoses.

To enter diagnosis data:

1. To enter a date, double-click the **Date** field.
2. The system displays the default date.
3. Edit the date field.
4. Click in the *** Primary** field to enter a primary diagnosis or double-click to select from the menu.
5. To enter a secondary diagnosis, click in the **Secondary** field or double-click to select from the menu.
6. To add a new line for more diagnosis entries, press **Enter**.

Fields	Max Length	Description
Date		Diagnosis date. The system displays a default date. Double-click to enter the start date.
Primary*	50	Primary diagnosis. Double-click to select from the drop-down menu or click to add a new entry.
Secondary	50	Secondary diagnosis. Double-click to select from the drop-down menu or click to add a new entry.

Medications Tab

Use the **Medications** tab to list all medications the patient is currently taking, as well as medications the patient has taken in the past.

> ***NOTE**: If the **Date Stopped** value occurs before the **Date Started** value, the **Date Started** value automatically resets to the same date as the **Date Stopped** value. Set the **Date Started** value to an appropriate value.*
>
> ***NOTE**: On Session Reports, the most current information prints for: patient name, MRN, physician and risk level. However, Session Reports show only the medications and diagnoses that were in the patient's saved information the day of the session. Any medications added to the patient's information after the session do not change the medication or diagnoses printed for the completed session, even if the dates overlap with the session date.*

Fields	Max Length	Description
Medication Class	25	Type of medication. Select from the drop-down menu or double-click to add a new entry.
Medication Name*	50	Name of the medication. Select from the drop-down menu or double-click to add a new entry. Medications are sorted alphabetically after each entry. **NOTE**: Up to 30 medications can display on the Q-Progress reports.
Dosage	8	Medication dosage.
Units	15	Units for medication dose. Select from the drop-down menu or double-click to add a new entry.

Fields	Max Length	Description
		NOTE: Enter new units in an abbreviated form using four characters or less, for example: enter *mg* for milligrams.
Frequency	15	How often to administer the medication. Select from the drop-down menu or double-click to add a new entry.
Method	15	How to administer the medication. Select from the drop- down menu or double-click to add a new entry.
Date Started	--	Date the medication was started. Double-click to edit the default date.
Date Stopped	--	Date the medication was stopped. Double-click to edit the default date.

Risk Factors Tab

The **Risk Factors** tab is divided into sub tabs: History, Family, Lipid Profile, and Allergies.

History Tab

Use the **History** tab to record:

- Smoking—information about the patient's smoking habits and history, including whether or not the patient lives with a smoker.
- Alcohol—information about the patient's drinking habits, including frequency and type of alcohol consumption.
- Exercise—describes a patient's exercise activity type and frequency.
- Drug Abuse—information about patient's use of controlled substances.
- Other—data helpful to the rehabilitative care giver and crucial to prescribing treatment and recording progress.

Fields	Description
Smoking	
Lives With Smokers	If checked, indicates the patient lives with a smoker.
Smoking History	If checked, the fields in the smoking section are enabled.
Packs/Day	The number of cigarette packs smoked per day. **(0-10.00)**
Years	Number of years patient smoked (if patient no longer smokes) or has smoked (if patient continues to smoke). **(0-99)**
Date Stopped	If patient has stopped smoking, click the small checkbox in front of the date to edit the default date.
Alcohol	
Days/Week	The number of days per week the patient has an alcoholic drink. Use the arrows to select the number of days per week to enable this section. **(0-7)**
Drinks/Day	How many alcoholic drinks the patient has per day. **(0-99)**
Type of Alcohol	Select the type of alcohol the patient drinks.
Liquor **Wine** **Beer**	
Exercise	
Days/Week	The number of days per week the patient exercises. Use the arrows to select the

Fields	Description
	number of days per week to enable this section. **(0-7)**
Activity Type	Type of exercise. Select from the drop-down menu or click to add a new entry.
Intensity	Select the intensity of the patient's workout.
Light **Moderate** **Heavy**	
Minutes/Day	
0-15 **16-30** **31-45** **46-60** **>60**	
Other	Select the risk factors that are applicable.
Depression **Diabetes** **Pacemaker** **Hypertension** **Family History** **Hyperlipidemia** **Sedentary Life Style** **Obesity** **Stress** **AICD**	
Drug Abuse	This tab contains a text box for describing nature of the drug abuse.

NOTE: *If the patient has a pacemaker, you must check the* ***Pacemaker*** *check box before admitting the patient. Otherwise, pacer spikes are not detected. Q-Tel RMS displays pacer spikes for informational purposes only and provides no analysis information for these spikes.*

NOTE: *Turn off the Muscle Artifact filter to see the pacer spikes in the waveform data. See Configuring the ECG display.*

Family History Tab

Use the **Family** tab to record all notes regarding family support and family history.

Fields	Max Length	Description
Support	1000	The amount and type of support the patient has.
History	1000	Patient's history.

Lipid Profile Tab

Use the **Lipid Profile** tab to record lipid draws and their associated levels. Enter any number of lipid profiles. To add a new line, press **Enter**.

Fields	Description
Draw Date*	Required field. Double-click to edit the default date.
Chol	Cholesterol. Double-click to enter a value or use the scroll arrows to adjust the level.
LDL	Low-density Lipoproteins. Double-click to enter a value or use the scroll arrows to adjust the level.
HDL	High-density Lipoproteins. Double-click to enter a value or use the scroll arrows to adjust the level.
Trig	Triglycerides. Double-click to enter a value or use the scroll arrows to adjust the level.
Tc/HDL	Total Cholesterol/High-density Lipoproteins. Double-click to enter a value or use the scroll arrows to adjust the level.
Lp(a)	Lipoprotein (a). Double-click to enter a value or use the scroll arrows to adjust the level.

Allergies Tab

Use the **Allergies** tab to record patient allergies. Enter any number of allergies. To add a new line, press **Enter**.

Fields	Max Length	Description
Allergy	100	Enter the patient's allergy.
Medication Allergy	100	Enter any allergies to medications.
Allergy Comment	1000	Enter any comments regarding the allergies.

Program Tab

When you enter a new patient in the Q-Tel RMS system, that person is enrolled into a general program. Use the **Program** tab, to enter information specific to the patient's program to ensure the most beneficial result. Changes to the Program when a patient is admitted to a session do not take effect until the next session

NOTE: *For more information on creating and editing the general programs refer to Programs Tab.*

Fields	Description
Program	The system displays the selected program.
Enrollment Date	The system displays the date the patient record was created. Click in the field to edit the date.
Lead Set	
Overall Risk Level	Select the appropriate risk level.
No Risk	

Fields	Description
Low **Moderate** **High**	
Sessions	
Planned	The default number of sessions for the program as configured in the Configuration Utility. **(0-99)**
Approved	The number of sessions for which insurance approval has been obtained. Default is zero. **(0-99)**
Don't Remind Sessions	Turns off the alert function when the patient exceeds the number of approved sessions. When this box is checked the system does not remind you to obtain approval for additional sessions.
Completed Program	Indicates the patient has completed the program. Use this check box to indicate the patient has completed a program, or to discharge the patient and enroll the patient in a different program. Once you mark a patient as complete, you cannot admit the patient to sessions. To allow the patient to be admitted again: • Uncheck the **Completed Program**.
Admit to New Program	This button opens the New Patient tab to enroll this patient in a new program if the **Completed Program** check box is checked. To enroll the patient in a new program: 1. Select Admit to New Program. The system displays the New Patient tab with only the **Program** field enabled. 2. Select the new program from the drop-down menu. Changing a patient's program resets the values on the **Program**, **Rx**, and **Alarms** tabs to the system defaults. The patient goals, comments, and previous session data is also reset, use the Q-Progress application to view this data.
Patient Goals	Lists the goals for the patient. Enter goals for the patient to achieve during the program. To create a new line, press **Enter**. Patient goals are listed in the order you enter them. Up to 10 patient goals can display in the Q-Progress reports
Comments	A text entry field for comments.

When you admit a patient to a session and the session number is higher than the number of approved sessions, the system displays a warning, unless **Don't Remind Sessions** is checked for the patient. The system does not prevent you from admitting the patient, but it does remind you to seek approval for more sessions if necessary.

Caution: Data delay.

A large number of patients and sessions in your Q-Tel RMS database can cause a system delay of up to 15 seconds when ending a patient's program and enrolling the patient in another program. Changing a patient's program should not be done when monitoring patients.

Prescription (Rx) Tab

The **Rx** tab initially contains the default prescription from the Program assigned to the current patient. Use the **Rx** tab to tailor the prescription to fit the patient. For more information on setting up a prescription, see Prescription.

The prescription on the **Rx** tab is associated with the specific patient and follows the patient through the entire rehab program and is updated as progress or setbacks dictate. The prescription shows in the patient's individual session tab after you admit the patient to a session. You can edit the prescription:

- At any time during a session.
- If the edits are made after the patient is admitted to a session, then the prescription changes take effect for the next session.
- In Patient Information.
- In Charting and Editing while viewing a completed exercise session summary for guidance on patient performance.

Printing A Prescription

Use the report type field to select a report.

> ***NOTE:*** *To print a Demographics report, see Printing a Demographics Report.*

To print a prescription:

Use the report type field to select a report.

> ***NOTE:*** *To print a Demographics report, see Printing a Demographics Report.*

To print a prescription:

1. Select **Prescription** from the report type menu at the top of the Q-Tel RMS display.
2. Select the destination:
   - **Printer**—to send the report to a printer.
   - **PDF**—to store the report as in the Adobe PDF format.
3. Click on the **Run Report** button to generate the report.
   - PDF formatted reports are stored in this folder on a Standalone Tower:
     `C:\Program Files\Quinton\QTel RMS\Patient_Reports.`
   - For a networked Q-Tel RMS configuration, PDF formatted reports are stored in this folder on a Main Tower:
     `C:\QTelDataCenter\Patient_Reports.`

Modifying A Prescription

To modify a prescription from the **Rx** tab:

To	Do this…
 Add a modality	1. Click the **Add New** icon. The system inserts a blank line above the highlighted modality. 2. Double click in the **Modality** field and select an exercise from the drop down menu. The exercise prescription supports up to 12 exercise activities and exercises can be repeated. 3. Edit the setting for the prescription fields.
Change a modality	Double click the **Modality** field and select an exercise from the drop-down menu.
 Change the order of the modalities	Select the modality and then click the **Move Up** or **Move Down** arrows. **NOTE**: Rest must be the first activity in the prescription list, and Recovery must be the last activity in the list.
 Delete a modality	To remove an exercise modality, select the modality and the click Delete Line. **NOTE**: Rest and Recovery cannot be deleted from the prescription.
Modify the prescribed exercise duration	Double-click **Duration** to activate the scroll arrow keys or enter the duration.
Select a timed option	Double-click **Timed** to add or remove the check mark. The default is on (a check mark in the checkbox). **NOTE**: The use of timers depends on the type of exercise modality used. You can designate your preference in the prescription for each modality and also choose the exercise time allotted.
Enter workload parameters	Double-click **Workload** field or enter the value for the first parameter. The field changes automatically to display the available parameters. Enter values for the workload parameter to identify the workload for a selected exercise device (see *Workload Parameters*). If a METS equation is defined for the selected device, the system computes the METS for the workload values.
Modify selections for storing a strip and printing a strip	Double-click **Store Strip** or **Record Strip**, and select an option from the drop-down menu:

Prescription (Rx) Fields

Fields	Description
	The system displays a green arrow to indicate the selected Modality.
Modality	The exercise modality. Double-click to select from the drop-down menu or click to enter a new activity.
Duration	The duration of the modality. Enter a value or double-click to use the scroll arrows.
Timed	A checkmark indicates the modality is timed.
Workload	Enter the values for the parameters required for the METS equation.
METS	The calculated basal metabolic rate.

Fields	Description
Store Strip	Select the condition that initiates the saved strip. Options are: • **No**—Do not save or print • **Midpoint**—Save or print at the mid-point of the exercise modality • **Max heart rate**—Save or print at the maximum heart rate • **Min heart rate**—Save or print at the minimum heart rate • **At Start**—Save or print at the beginning of the modality • **End-30**—Save or print 30 seconds before the exercise modality completes • **End-60**—Save or print 60 seconds before the exercise modality completes • **Custom...**—Specify a time from the beginning or the end of the exercise. Enter a positive number (for example, 60) to specify a time from the beginning of the exercise. Enter a negative number (for example, -60) to specify a time before the end of the exercise. When you add an exercise activity to the prescription, the **Save Strip** setting always defaults to **Max Heart Rate** and the **Print Strip** setting always defaults to **No.**
Record Strip	Select the condition that initiates the printed strip. (See **Store Strip** options above.)

Alarms Tab

Use the **Alarms** tab to configure alarms specifically for this patient. The initial alarms are default alarms as configured by the configuration utility (see A*larms Tab)*. You can set patient-specific limits for those alarms that have limits, as well as attributes for priority, persistence, recording and storing.

- The priority settings for Asystole, Ventricular Fibrillation, and Ventricular Tachycardia are set to High. They cannot be modified.

  NOTE: *The system cannot detect alarms when there is a lead-off condition, therefore, the Lead Off alarm priority is set to High.*

- Setting the priority of an alarm to **Off** disables the **Record Strip** and **Store Strip** selections. The system does not record or store alarm units for alarms set to **Off**. However, the system annotates the alarm conditions in the Full Disclosure data for the patient.
- If your system does not include the Advanced Arrhythmia option, then you can select and configure the Asystole, Ventricular Fibrillation, Ventricular Tachycardia, High Heart Rate and Low Heart Rate alarms only.
- If the edits are made when the patient is admitted to a session, then the changes take effect for the next session.

Fields	Description
Alarm type	The type of alarm.
Limit	Alarm threshold. Some alarms use a threshold setting to initiate the alarm. Enter the threshold limit or double-click to use the scroll arrows.
Persistence	A drop down menu to select the way the system represents the alarm. Options are: • Audio and Visual • Visual • Off
Priority	A drop-down menu to select the priority of the alarm. Options are: • Low • Medium • Off
Record	A checkmark indicates the system will record the alarm.
Store	A checkmark indicated the system will store the alarm.
Test Alarms	Sounds the alarm to test the volume.

Assessment Tab

Use the **Assessment** tab to configure details for the Patient Intake Assessment report. The Assessment tab is organized into these tabs:

- Clinical Assessment
- Behavioral Assessment
- Health Assessment
- Services Assessment
- Comments

Clinical Assessment

Use the clinical assessment to record clinical observations including:

- Obesity/Dyslipidemia
- Diabetes/Hypertension/Heart Rate
- Functional Assessment
- Pulmonary

Obesity/Dyslipidemia

Use this tab to record the progress in the patient's weight and lipid levels at the time of the assessment.

Fields	Description
Obesity	
Weight	The weight of the patient. The system displays the weight entered in the Patient Information tab.
Height	The height of the patient. The system displays the height entered in the Patient Information tab.
BMI	The body mass index of the patient. Enter the BMI or use the arrows to adjust the value.
Dyslipidemia	
LDL	The LDL level of the patient. Enter the LDL level or use the arrows to adjust the value.
HDL	The HDL level of the patient. Enter the HDL level or use the arrows to adjust the value.
Triglycerides	The level of triglycerides for the patient. Enter the triglycerides level or use the arrows to adjust the value.
Other	
Metabolic Syndrome	Indicates whether or not the patient has Metabolic Syndrome. Select: • Yes • No • (blank)
Depression	Whether the patient reports depression. Select: • Yes • No • (blank)
Pain Scale	The level of pain reported by the patient. Valid values are: • 0 through 10
Description	A text field to describe the pain experienced by the patient.

Diabetes/Hypertension/Heart Rate

Use this tab to record the patient's Diabetes, Hypertension, and Heart Rate function.

Fields	Description
Diabetes	
HbA_{1c}	The glycated hemoglobin of the patient. Enter the HbA1c or use the arrows to adjust the value.
Fasting Glucose	The fasting glucose of the patient. Enter the fasting glucose level or use the arrows to adjust the value.
Hypertension	
Resting BP	The resting blood pressure of the patient. Enter the blood pressure or use the arrows to adjust the value. (Maximum values are 400/399.)
Exercise BP	The exercising blood pressure of the patient. Enter the blood pressure or use the arrows to adjust the value. (Maximum values are 400/399.)
Heart Rate	
Rest	The resting heart rate of the patient. Enter the heart rate or use the arrows to adjust the value.
Target	The target heart rate of the patient. Enter the heart rate or use the arrows to adjust the value.
12 Lead ECG	Indicates whether a 12 lead ECG is available. Select: • Yes • No • (blank)
Date	Indicates the date of the ECG. Edit the default date.
Result	A text field to describe the result of the ECG.

Functional Assessment

Use this tab to record the patient's functionality through the exercise modalities.

Fields	Description
Assessment Exercise	The exercise used for the functional assessment. (Default is 6 minute walk.)
RPE	The rate of perceived exertion of the patient during the exercise (Peak modality). Enter the value or use the arrows to adjust the value.
METS	The calculated basal metabolic rate (Peak modality). Enter the value or use the arrows to adjust the value
Distance	In the **Peak** modality enter the distance covered during the exercise or use the arrows to adjust the value.
HR	The patient's heart rate during the exercise. For each modality: Rest, Peak, and Recovery, enter the heart rate or use the arrows to adjust the values.
BP	The patient's blood pressure during the exercise. For each modality: Rest, Peak, and Recovery, enter the blood pressure. (Maximum values are 400/399.)
SpO2	The oxygen saturation levels during the exercise. For each modality: Rest, Peak, and Recovery, enter the SpO2 value or use the arrows to adjust the values.
Comments	A text entry field for comments.

Pulmonary

Use this tab to record the patient's pulmonary function.

Fields	Description
Lung Sounds	A text field for describing the sounds of the patient's lung.
SpO2	The oxygen saturation levels during the exercise. Enter the SpO2 value or use the arrows to adjust the values.
Resp. Rate	The patient's respiration rate during the exercise. Enter the rate or use the arrows to adjust the values.
O2 Flow	The patient's oxygen flow. Enter the value or use the arrows to adjust the values. (Maximum value is 100.)
Room Air	Whether the patient was breathing room air. Select **Yes** or **No**.

Behavioral Assessment

Use the clinical assessment to record behavioral observations including:

- Nutrition
- Social Environment

Nutrition

Use this tab to record the progress in the patient's nutritional behaviors.

Fields	Selection	Description
Patient follows prescribed diet	**%**	Indicates how closely the patient follows a prescribed diet. Enter the rating (as a percentage) or use the arrows to adjust the value.
Significant weight change in the last 12 months	• **Gain** • **Loss**	Records patient's weight gain or loss. 1. In Change, enter the amount of change (in lbs) or use the arrows to adjust a value. 2. Select Gain or Loss.
Appetite	• **Good** • **Fair** • **Poor**	Indicates the patient's appetite.
Vitamin Supplements	• **Yes** • **No**	Select whether or not the patient takes vitamin supplements.
Dietary Restrictions	• **Low Salt** • **Diabetic** • **Ulcer** • **Hiatal Hernia** • **Low Fat/Chol** • **Other**	Indicates any diet restrictions for the patient.
Patient has problems with	• **Chewing** • **Digesting** • **SOB after meals** • **Swallowing** • **Nausea** • **Bloating** • **Dental** • **Other**	Indicates any problems the patient has with eating or nutrition.
Food Allergies	**--**	A text box to enter any food allergies the patient has.
Dietary Counseling Indicated	**--**	Indicates the patient should be referred to dietary counseling.
Date	**--**	Indicates the date the form was completed. Edit the default date.

Social/Environment

Use this tab to record information about the patient's environment.

Fields		Description
Housing	**Apartment** **House** **Assisted Living**	Indicates the type of housing where the patient resides and any assistance available.
	Has help w/yard work	Indicates the patient has help with yard work.
	Stairs to climb	Indicates the patient's residence has stairs to climb.
Lives with	**Spouse** **Alone** **Friend** **Partner**	Indicates the living situation for the patient.
	Other Family	Indicates the patient also lives with other family members.
	Pets	Indicates the patient also lives with pets.
Assistive Devices	**Walker** **Cane** **Wheelchair** **Oxygen** **CPAP**	Indicates the type of assistance a patient uses. Select any devices the patient uses.
Transportation	**Self** **Public** **Friend/Family** **None**	Indicates the type of transportation used by the patient.
Occupation		A text field. Enter the patient's job.
Retired		Indicates that the patient is retired from the listed occupation.

Health Assessment

Use the health assessment to enter patient comments.

***NOTE**: To enter comments in the Comment Library*, see *Health Assessment Comments*.

Choose a method to enter comments:

- Enter a comment in the comment field.
- Select a comment from the comment library and click the **Paste** button.

Health Assessment Tab Fields

Fields	Description
Comment Library	A menu of pre-defined comments. Select a comment from the comment library.
Comment	A text entry field for comments. (Maximum of 1,000 characters).

Services Assessment

Use this tab to record the progress in the patient's required medical services.

Fields	Description
# ER Visits	The number of emergency room visits. Enter the number of visits or use the arrows to adjust the value.
# Hospital Visits	The number of hospital visits. Enter the number of visits or use the arrows to adjust the value.
Satisfaction Survey	Indicates how satisfied the patient is. Enter the rating or use the arrows to adjust the value.
# Dr. Visits	The number of doctor visits. Enter the number of visits or use the arrows to adjust the value.
# Medication Rx	The number of medications. Enter the number of medications or use the arrows to adjust the value.

Comments

Use this tab to record comments regarding the patient health and/or progress.

Fields	Description
Comments	A text entry field for comments.

PCP (Patient Care Plan) Tab

Use the **PCP** tab to configure details for the Patient Care Plan report. The Patient Care plan is organized into these tabs:

- Exercise Plan
- Nutrition Plan
- Education Plan
- Psycho-Social Plan
- Expected Outcomes

Exercise Plan

Use this tab to record progress with the patient's exercise plans:

Fields	Description
***Exercise Goals**	Lists the exercise goals. Select a pre-defined goal, or enter text. For each goal you can select: • **Met** • **Not Met** • **In Pro.** (In Process)
Comments	A text field to enter comments for the selected goal.
Intervention	A text field to describe interventions.
Date field	Select the date of the entry.

Nutrition Plan

Use this tab to record the patient's nutrition progress:

Fields	Description
***Nutrition Goals**	Lists the nutrition goals. For each goal you can select: • **Met** • **Not Met** • **In Pro.** (In Process)
Comments	A text field to enter comments for the selected goal.
Intervention	A text field to describe interventions.
Date field	Select the date of the entry.

Education Plan

Fields	Description
***Education Class Description**	Lists the education classes. Select a class or enter the class name.
Date Complete	The date the patient completed the class. Enter the date.
Understands	Describes how well the patient understands the class material.
Met	Indicates the class goal was met.
Not Met	Indicates if the class goal was not met.
In Pro.	Indicates patient is currently enrolled in the class.
Comments	A text field to enter comments.

Psycho-Social Plan

Use this tab to record the patients psychological and social support plans. To complete the psycho-social plan:

1. Select the appropriate **Symptom**.
2. Enter the **Nursing Intervention**.
3. Select whether the intervention has been **Met**, **Not Met**, or is **In Pro.** (in process).
4. Enter any comments in the **Comments** field.

Fields	Description
Symptoms	Lists the patient's symptoms. Options are: • **Stress** • **Depression** • **Anger/Hostility** • **Grief** • **Job** • **Family** • **Other**
Nursing Interventions	A text field to enter the interventions used to address the symptoms. For each intervention, indicate: • **Met** • **Not Met** • **In Pro.** (In Process)
Comments	A text field to enter comments.

Expected Outcomes

Fields	Description
Exercise	Enables the available outcomes for exercise. Enter: • **METS**—enter the goal basal metabolic rate for the patient. • **Per Week**—enter the number of times the patient will exercise each week.
Weight MGMT	Enables the available outcomes for weight management. Enter: • **Target WT**—enter the patient's goal weight. (Maximum 999.99)
Diabetes MGMT	Enables the available outcomes for diabetes management. Enter: • **Hb1Ac**—enter the patient's goal for glycosylated hemoglobin.
Smoking	Enables the available outcomes for smokers. Select: • **Quit** • **Reduce**
Cholesterol	Enables the available targets for cholesterol. Enter: • **LDL**— enter the patient's goal l Low-density Lipoproteins level. • **HDL**— enter the patient's goal l High-density Lipoproteins level. • **TRI**—Triglycerides. Enter the patient's goal triglycerides level.
Other	When checked the associated text field prints on the report. If Other is not checked the text field displays in the tab, but is not printed.
Text field	A text field for any additional goals or expected outcomes and the measurement criteria.

SESSION MANAGEMENT

Use the Session Management component of Q-Tel RMS to admit patients into monitored or non-monitored sessions and to record session information for each patient. Use the Session Management screen to view the status of all patients at a glance or one at a time. The Session Management component includes:

- Session activities grid (Admit tab)
- Full Disclosure Viewer
- Comments
- Discharge Options
- Session Reports

> ***NOTE:*** *For Session Management information specific to a networked Q-Tel RMS, refer to* Network Operation and Workstation Capabilities.

Accessing Session Management

To access the Session Management screen:

1. Click the Session Management icon.
2. To select a patient choose a method:
   - Select an existing patient. For instructions on searching for a specific patient, see *Patient Information*.
   - Add a new patient. Click **Add New Patient** and follow the instructions for *Adding A New Patient*.

Admit Tab

You can admit patients to an active session either as monitored or non-monitored. The number of simultaneously monitored patients you admit must be less than or equal to the number of receivers you purchased with your tower, typically 4 or 8. The number of non-monitored patients that can run at the same time is limited to 16.

The system displays a warning dialog box if a Phase II (Monitored) patient is admitted to a non-monitored session or if a Phase III (non-Monitored) patient is admitted to a monitored session.

WARNING! Obscuring data.

While patients are admitted to monitored sessions, promptly attend to and dismiss Q-Tel RMS application and computer operating system messages (such as out of paper). Do not allow these messages to obscure the ECG monitoring data on the display.

WARNING! Alarm notification.

Be aware of and immediately correct any system issues that can affect notification of alarms, such as a poorly adjusted monitor or an alarm component error message.

WARNING! Signal range.

Ensure that monitored patients know the allowable range of movement within your facility. The patient's ECG signal is lost if the patient goes out of range.

NOTE: *Refer to the S2 Transmitter User Manual, 9515-210-50-ENG for information on electrode placement, impedance check, and other aspects of preparing the patient for monitoring.*

To	Do this…
Admit a patient to a new session	1. Select a patient. 2. Click **Admit** or double-click the patient. The system displays an admit dialog box. 3. Select the lead set corresponding to the method used to prepare the patient from the drop-down menu. 4. Select options for a prescription worksheet, and session monitoring. 5. Select the number corresponding to the patient's transmitter (monitored session) or click **Non-Monitored** (non-monitored session). When a patient is admitted, the system increments the patient's session number only if the previous session was billable. The system does not include non-billable sessions in the number of completed sessions. **NOTE**: When you admit a patient to a session and the session number is higher than the number of **Approved** sessions, the system displays a warning. The system does not prevent you from admitting the patient, but it does remind you to seek approval for more sessions if necessary

Print a tabular Prescription Worksheet for the patient	• Click in the check box for **Print prescription** in the admit dialog box. The Prescription Worksheet prints to the laser printer and includes:
	  • Patient's name and MRN.
	  • Patient's program name and the current session number.
	  • Prescribed modalities, exercise times and workloads.
	  • Headings for the parameters associated with the patient's program.
	The printed page is suitable for use on a clipboard. Use the report to record actual exercise and vital sign information during the rehab session for later entry into Q-Tel RMS.

Select a Monitored or Non-Monitored session for the patient	• For a monitored session, click on the number corresponding to the transmitter number assigned to the patient. **NOTE**: Verify that the patient is assigned to the correct S2 transmitter that has been powered ON. Check that the patient name and date of birth on the S2 transmitter demographic screen are a match to the patient. • For a non-monitored session, click **Non-Monitored**. **NOTE**: Non-monitored patients do not have a corresponding ECG display tile. You can enter exercise accomplishments and vital signs.
View or edit patient information	1. Select a patient. Select any patient, including patients admitted to a session. 2. Click **Show Patient Info**. The system displays the Patient information screen. 3. To return to the **Session Management** Screen, click the **Session Management** icon.
Add a new patient (Quick Admit)	Select Add A New Patient. Add a new patient using the instructions for *Adding A New Patient*. If the patient is added on a different station than the one you are currently working on, you may need to click the **Refresh List** button to make the new patient display on your list

Admit Tab Fields

Fields	Description
Monitored	Lists the patients that have been admitted to a monitored session.
Non-Monitored	Lists the patients that have been admitted to a non-monitored session.
<<Admit	This button admits patients to a session.
Show Patient Info	This button displays the **Patient Info** tab on the **Patient Information** screen.
Add New Patient	This button displays the **New Patient** entry screen.
Refresh List	This button updates the list with changes. For more information on Refresh, see *Additional Features in Patient Information*.
Patient	Displays the name of the patient.
MRN	Displays the MRN for the patient
Completed	Indicates the number of sessions the patient has completed.
Approved	Indicates the number of sessions approved for this patient.

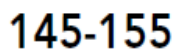
ECG Monitoring Tile

After the patient is admitted as a monitored patient, the system starts an ECG monitoring tile for that patient. The ECG monitoring tile displays the real-time ECG waveform data and provides user feedback and control of key activities.

If the patient transmitter is properly connected, the ECG monitoring tile will display the patient's ECG. If an error message appears (e.g. "Comm. Failure") or the wave form is flat, verify that the transmitter is turned on, properly configured and operating as expected.
The name of the currently selected patient displays at the top of the screen as selected patient. The left side of the tile for selected patient, displays in a lavender color. To switch focus to a different patient, click on another tile or click on the patient name in the name list in the upper left portion of the screen.

WARNING! Alarm conditions in Standby mode.
Alarm conditions excluding Low Battery will not be indicated in Standby Mode.

Icon	Label	Description
	**Store Strip**	Manually saves the ECG strip when a clinically significant event occurs. The number of strips stored for the patient's session is displayed below the **Store Strip** button. These strips are in addition to the strips automatically stored for alarms and modalities.
	**Record Strip**	Prints the ECG on the laser printer. The number of pending strips displays below the **Record Strip** button.
	**Configure ECG**	Change the ECG display. See *Configuring the ECG display*.

Icon	Label	Description
	**Toggle Standby Mode**	Toggles between Normal and Standby modes to control ECG arrhythmia recognition.
	**Mode/Alarm Indicator**	Displays the current ECG analysis mode (**Standby**, **Learn** or Normal - <blank>) or the active or persisted alarm.
	**Audible Alarm Indicator**	Illuminates for the patient whose alarm is generating the audio alarm sound.
	**Blood Pressure**	Displays the blood pressure reading entered for the current modality. When a new modality is started, the Blood Pressure field is blank until a new blood pressure reading is entered for that modality.
	**% of Target HR**	Displays the target heart rate range and color codes the graphic to represent the percent of target heart rate achieved. Yellow—below the range Green—within the range Red—above the range
	**Current Heart Rate**	Displays the current calculated heart rate for the patient.
	**Activity Timer**	Displays the remaining exercise time on a modality (timers).

Printing the Current ECG

You can select strips to be printed.

The printed strips are the primary and secondary leads displayed on the ECG tile at the time the strip was generated. The number of leads printed is set in the Q-Tel RMS Configuration Utility (see *Storing or Recording Strips*).

To print ECG strips on a laser printer:

- Click the **Record Strip** button.

The number of strips waiting to be printed (pending) displays below the Record Strip button.

The system limits the number of pending strips to 50. If you exceed this limit, you can print the strips from Full Disclosure later.

Configuring the ECG Display

To configure the ECG Display:

1. Click the **Configure ECG** button. The system displays the ECG configuration dialog box. The selected patient's name displays at the top of the dialog box.

To	Do this…
Change the displayed gain	• Click on the **Gain** setting.
Toggle the display of the ECG grid on the monitoring tile.	• Check **Show Grid** to display the grid. • Uncheck **Show Grid** to hide the grid.
Display two ECG channels (when space is available given the number of monitored patients.)	• Check **Show Secondary Trace** to display two ECG channels, uncheck to display only one ECG channel.
Activate the Muscle Artifact filter	• Check Apply Muscle Artifact Filter to select the filter, uncheck to disable the filter. The filter reduces motion induced noise.
Change the displayed leads	1. Highlight the lead in the **Leads** scroll box. 2. Use the scroll arrows to move the lead to the first (primary lead) or second (secondary) position in the list.

2. Click **OK** to save the changes. The system updates the ECG display.

Real-time ECG Display

The ECG display displays 3.9 or more seconds of the patient's live ECG and one to two channels of ECG data. The number of channels displayed depends on the default trace selections (see *Trace Setup Tab*), the number of patients admitted, and the selected ECG Configuration setting for that patient.

Figure 3 Example of a Real-time ECG

1	Patient Name
2	Active Modality
3	Transmitter Number
4	Current Trace Gain
5	Medical Records Number

Session Tab

The session view contains the sub-tabs:

- Group view—Displays a summary view of all patients
- Individual view—Displays a detail view for the selected patient. The system changes the Individual tab title to reflect the currently selected patient.

Group View

Use the **Group** tab to view all monitored and non-monitored patients. All activity for a specific patient displays on a single line.

Changing the Activity for the Selected Patient

To change the activity for a patient in the group view:

1. Double-click the **Modality** column for the patient.
2. Select a different modality from the drop-down menu.

Changing the Selected Patient

Choose a method to change the selected patient:

- Click on a different patient in the group view grid.
  The green arrow moves to that patient, the tile for that patient highlights in the color lavender, and the patient's name displays as the selected patient at the top of the screen.
- Double-click on a patient cell in the Group view.
  The system displays the Individual view for the patient and the patient becomes the selected patient.

Individual View

Use the Individual view tab to view the selected patient and all the session activities associated with that patient for the current session.

Activity Management

The Activity management tools function the same in both the Group and the Individual views.

- In the Group view, the Activity Management tools apply to the patient indicated by the green arrow in the first column. In the Individual view, the Activity Management tools apply to the modality indicated by the green arrow in the first column. To change the position of the green arrow, click another patient in the Group view or another modality in the Individual view.
- When a button is greyed out, it is not available.

Icon	Activity Management Tool	Description
	**Start/Resume**	Starts a modality that is currently pending or resumes a modality that is currently paused. When a modality is in progress, the modality active icon displays in the status column of the activity grid. When an exercise modality is paused, the system changes the label of the button to **Resume**. When you select **Resume**, the system copies that modality, leaving the previous portion of the activity marked as done. The system resumes running again and the modality active icon displays in the status column of the activity grid.
	**Pause**	Temporarily stops the modality. An exercise modality that is paused is marked with a yellow exclamation point (!) in the status column of the session activity grid. **NOTE**: You cannot pause the **Rest** and **Recovery** modalities.
	**Done**	Ends the modality. • Timed modalities—**Done** applies to timed modalities that are running or paused only. When a timed modality is marked **Done**, the system automatically displays the elapsed time in the Time column and annotates the modality with a checkmark in the status column of the session activity grid. **NOTE:** You cannot mark the Recovery modality as **Done**. To stop the Recovery modality, discharge the patient. • Non-timed modalities—**Done** applies to non-timed modalities that are running, paused or pending. When a non-timed modality is marked **Done**, the system automatically displays the duration in the **Time** column and annotates the modality with a checkmark in the second column of the session activity grid.
	**Add New**	Adds a new modality to the patient's current session. To add a new modality: 1. Select a modality. The system inserts the modality in the row above the selected modality. 2. Click **Add New**. 3. Double-click on the new modality field. 4. Select an exercise device. 5. Enter the duration, and click the timer check box to set on or off. 6. Select **Record Strip** and **Store Strip** settings.
	**Reset**	Returns the exercise modality to a pending state. Resetting an exercise modality clears the **Time** and **HR** columns and any calculated heart rate parameters, such as **%THR** and **Avg HR**. Other parameters, such as BP and RDE, are not reset. The system does not remove sorted strips from Full Disclosure data, but they are not annotated with the modality. **NOTE**: You cannot reset the **Rest** modality.
	**Delete**	Deletes the modality from the session and allows you to change the prescription to reflect the session. **NOTE**: You cannot delete Rest, Recovery, or the active modality. To delete a modality: 1. Select the modality and click **Delete**. 2. To save the modified session as the new prescription, select **Save Rx**
	**Save Rx**	Saves any changes made to a patient's prescription during the session. When you select **Save Rx**, the system displays a confirmation message. Select **Yes** to apply the changes to future sessions.

Icon	Activity Management Tool	Description
		**NOTE**: In a networked Q-Tel RMS configuration, if another station has the same patient open in **Patient Information** and the **Rx** tab displayed, you can make changes to the prescription for the current session but you cannot save those changes until the other station closes the patient or moves to a different tab in **Patient Information**.
	**Unlock**	Releases a patient record for another user to access.

Patient Session Data Tabs

Use the **Patient Session Data** tab to enter session data, and rapidly change exercise plans to meet patient needs. The Patient Session data displays an activity grid.

Column	Description
 Selection (Column 1)	The system displays a green arrow that points to the selected modality. To change the status of the modality, use the Activity Management tools. To select a modality, click on another line.
Status (Column 2)	The system displays the status of the exercise prescription. Modalities that are complete display a checkmark. • A modality currently in progress is marked with the modality active icon. • A modality that is cancelled (Disabled) is marked with an **X**. • A modality that is Paused is marked with an exclamation point (!). Pending modalities do not have any status markings.
Modality	Lists the prescribed modalities, starting with Rest and ending with Recovery. **NOTE**: If you start the wrong modality, you can change the modality while the exercise is in progress or after it has been marked done. The ECG data collected during the modality is annotated with the new (correct) modality name. To change any exercise modality: Double-click on the exercise device name and select a different modality from the drop-down menu.
Timed/Not Timed	Modalities that are checked start the timer for the prescribed duration. Modalities that are not checked are run without the timer. To select or un-select the check box: • Double-click on the check box. Once the modality is started, you cannot change the **Timed** check box.
Time	The system supports timed and non-timed modalities. • For timed modalities—The **Time** field shows the count-down of the prescribed time. When the task is completed (marked as **Done** or the countdown time reaches zero), the **Time** field shows the actual exercise time. • For non-timed events—The **Time** field remains blank until the modality is marked as **Done**. The **Time** field then displays the prescribed exercise duration. When the system starts a timed activity, the **Time** column displays a timer that counts down the time remaining based on the prescribed duration. If a patient is monitored, then the status of the timer displays on the patient tile as well. Once

Column	Description
	the timer counts down to 0, the system automatically marks the activity as done. The exception is the Recovery modality, which continues to mark time until the patient is discharged. **NOTE**: You can edit the value in the **Time** field of a completed modality as necessary.
Duration	View and change the prescribed exercise time. You can change this field both before a modality is started and while the modality is in progress. Updating the prescribed time updates the timer.
Store	Access the rule for saving an ECG strip for the modality. To save the ECG strip: • Double-click on the disk icon. The system displays a menu for changing the store condition. You cannot change the rule while a modality is in progress or after the modality has been marked done. The default condition for exercise modalities is to save a strip at the maximum heart rate. After a modality has been marked done, the system updates the **Store** column with the number of strips saved for that modality.
Record	Access the rule for printing an ECG strip for the modality. To print the ECG strip: • Double-click on the icon. The system displays a menu for changing the record condition. You cannot change the rule while a modality is in progress or after the modality has been marked done. The default condition does not record any strips.
Workload and **METS**	A multi-functional field. Use this field to rapidly enter data for several conditions. • If the modality does not have an associated METS equation, such as for exercising with Bands or Weights, enter in any text string. • If the modality has an associated METS equation, the field dynamically changes for input of the associated parameters. Either double-click on the field, or start typing the value of the first parameter and the field automatically expands for data input. For example, the AirDyne modality requires the input of **Level** and **Weight**. Start typing the Level (for example, "3"). Tab to the next field and enter the **Weight**. • If the modality has multiple METS equations, select a METS equation to change. Tabbing out of the **Workload** field changes the input area to a simple field with the entered workload data. The adjacent **METS** column automatically displays the computed METS value. To override a METS value calculated by Q-Tel RMS: • Press the **CTRL** key and double-click on the **METS** cell for the patient and then enter the METS value. • If the modality does not have workload parameters or a METS equation, click in the field. • If you manually change a METS value and then change a workload parameter for that modality, the system automatically calculates a new METS value. Re-enter your manual METS value.
HR (Heart Rate)	For monitored patients, the system automatically enters the heart rate when the modality is completed. • For Rest and Recovery modalities, the default heart rate is determined by the lowest heart rate from the strips stored during the modality; if no strips were stored, the system displays the lowest heart rate detected during the modality. • For exercise modalities the default heart rate is determined by the maximum heart rate from the strips manually stored during the modality.

Column	Description
	• If no strips were stored manually, the system displays the maximum heart rate of strips automatically stored during the modality. • If no strips were stored, the system displays the highest heart rate detected during the modality. To manually enter a heart rate for monitored and non-monitored patients: Double-click on the **HR** cell for the patient and then type in the heart rate. **NOTE:** For monitored patients, if you manually enter the heart rate prior to completion of the modality, it is retained on completion of the modality; the manually entered heart rate is not overwritten by the system heart rate. **NOTE:** The **%tHR** parameter is calculated based on the heart rate displayed in the **HR** field. The **Min. HR** and **Max. HR** parameters do not update for changes to the **HR** field.
BP (Blood pressure)	For manual entry of blood pressure. Type blood pressure in the standard format, for example 120/80 (including the "/"). You can also press **Tab** to move from the first to the second value.
RPE	Rate of perceived exertion.
SpO2	Oxygen saturation levels.
Parameters	Captures custom parameter information for the patient. Double-click on the **Parameters** cell and the system displays a list of parameters selected for that modality. Note the modality and patient's name display above the list. To add new parameter: Click **New Parameter** and select the parameter from the list. • For Rest and Recovery, the system displays parameter data from the previous billable session for reference. • If you add a parameter to an exercise modality, it is added to all exercise modalities for that patient. In addition, all added parameters persist for future sessions for that patient. To delete a parameter, select the parameter and press the **Delete** key.

Full Disclosure Tab

Use the **Full Disclosure** tab to view the selected patient's complete ECG waveforms. The view initially shows 2.5 minutes of ECG waveform data, 30 seconds per line.

Full View Display

10 Minute Display

Show List of Stored Strips

Record Selected Strip

Add a New Strip

Delete Selected Strip

2.5 Minute Display

Zoom and Center Selected Strip

Show List of Alarms

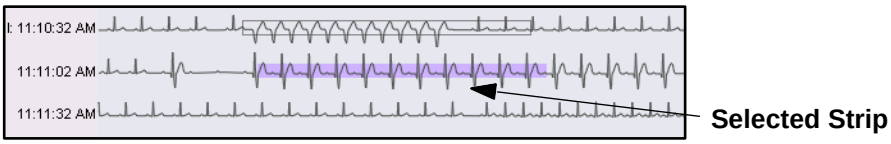
Print Full Disclosure Report

Display Settings

Restore Deleted Strip

Any strips that were saved, whether automatically or manually, are shown in the full disclosure as rectangles surrounding the waveforms included in the strip. You can select a strip by clicking on it. The selected strip is highlighted in a cyan color.

Figure 4 Example of the Full Disclosure Tab



To	Do this…
Select a view	• To view ten minutes of ECG waveforms, one minute per line, click the **10** button from the icon bar. • To view eight seconds of ECG waveforms, select the **Full** button.
Select a different strip	1. Click on the **Show List of Stored Strips** button. The system displays a drop-down menu of all strips that have been saved, the time they occurred and the median heart rate. 2. Select a strip from the list. The system changes the view to center on that strip.
Navigate between strips	• Click either the **Forward Strip** button (on the right) or the **Back Strip** button (on the left) at the bottom of the Full Disclosure display.
Print a selected strip	• Click the **Record Selected Strip** button. The system prints the strip to the laser printer. **NOTE**: The strip length on a laser printer is 8 seconds. For a 16- second strip, two 8-second strips print. The two 8-second strips show start times and other labels according to data recorded during two consecutive 8-second time spans. Laser printer strip labels reflect changes in modality, Muscle Artifact filter setting, and other measurements between the two 8- second strips. For a 20-second strip, two 8-second strips and a 4-second strip print. Similar to the two 8-second substrips for a 16- second strip, each of the three sub-strips for a 20-second strip shows labels according to data recorded during its time span.
Return to the Full View	• Click the **Zoom and Center Selected Strip** button. The heart rate displayed in the lower right corner of a zoomed and centered strip is the average median heart rate of the strip.
Add a strip	• Click the **Add a New Strip** button.
Delete a strip	• Click the **Delete Selected Strip** button.
Restore the last deleted strip	• Click the **Restore Deleted Strip** button.
Display a list of medical alarm conditions detected during the monitoring period	• Click on the **Show List of Alarms** button. The system displays a drop-down menu that includes alarms raised during the session, as well as, alarms with the priority set to **OFF**. The menu shows the type of alarm, the time the alarm occurred, and the average heart rate. To include technical alarms in the list, click on the Display Settings button and select List Technical Alarms. **NOTE**: Only those alarms enabled for the system are detected. Refer to *Alarm Subsystem*.

To	Do this…
Change the lead displayed in Full Disclosure Viewer	• Click the **Display Settings** button and select the lead. The **Print Full Disclosure Report** selection is not available during session monitoring. Print the Full Disclosure Report when discharging the patient or after discharge from **Charting and Editing**.

Comments Tab

Use the **Comments** tab to enter comments at any time during the session. Enter comments in these categories:

- Critical comments
- Clinical comments
- Patient comments

The comments tab is divided into prior session (upper portion) and current comments (lower half).

Use the vertical scroll bar at the right of the session reminder dialog to view all of the comments when they exceed the amount of space in the dialog.

Entering Comments

You can incorporate prior comment, add new comments, edit comments, or select comments from a pre-defined list.

To	Do this…
Incorporate existing comments	• For each comment type, click on the **Copy** button between the top and bottom text areas.
Enter pre-defined comments	• Select a comment from the drop-down menu and click the **Paste** icon. You can enter multiple pre-defined comments, each comment is appended to the existing text.
Enter new comments or edit comments	• Click in the comments field and enter or edit comments.

Comment Tab Fields

Column	Description
Prior Session's Critical Comments	System-generated field. Contains the comments from the previous session.
Copy	This button copies the text from the prior session comments to the current session comments.
Critical Comments	Enter new comments or use the **Copy** button to enter the previous comments and edit the previous comments.
Prior Session's Clinical Comments	System-generated field. Contains the comments from the previous session.
Clinical Comments	Enter new comments or use the **Copy** button to enter the previous comments and edit the previous comments.

Column	Description
Prior Sessions's Patient Comments	System-generated field. Contains the comments from the previous session.
Patient Comments	Enter new comments or use the **Copy** button to enter the previous comments and edit the previous comments.
Set Reminder	Select this check box to display the comment the next time the patient is admitted to a session. Acknowledge the comment to admit the patient.

Discharge Tab

Use the **Discharge** tab to discharge the currently selected patient. The selections on the **Discharge** tab can be made at any time during the session. You can select patients for discharge individually or select them sequentially based on the position of the patient in the ECG tile monitoring area. When you are ready to discharge the patient, click the **Discharge** button.

If your system has a software license for Q-Exchange, you can select the session data for export from the **Discharge** tab.

Discharging a Patient

To discharge a patient:

1. Select a check box from the **Reason for Discharge**, or choose **Other** and then enter a reason in the **Comment** box.

Caution: Possible data loss.

If you select **Cancelled Session** as the reason for discharge, the system does not save the session data. The system prompts you to confirm this selection.

2. If the session is not billable, click the **Billable** check box to clear the checkmark.
3. To add the patient to the charting and editing list when discharged, click **Queue for Charting and Editing.** See *Charting and Editing*.
4. For each report click one or more check boxes to select an output:
   - Send to PDF file. PDF files are stored in this folder on Standalone Towers:
     `C:\Program Files\Quinton\QTel RMS\Patient_Reports`
     If generated on a networked Q-Tel RMS, PDF files are stored in this folder on the Main Tower:
     `C:\QTelDataCenter\Patient_Reports`
   - Print report. Each report includes basic patient demographic header information (name, medical record number, medications, etc.). Sample printouts of each report are provided at the end of this chapter.
5. If you are using Q-Exchange, select the export options.
6. To discharge the patient, click the **Discharge** button. If the patient that you have selected to discharge is not in Recovery when you click **Discharge**, the system displays a confirmation dialog box.

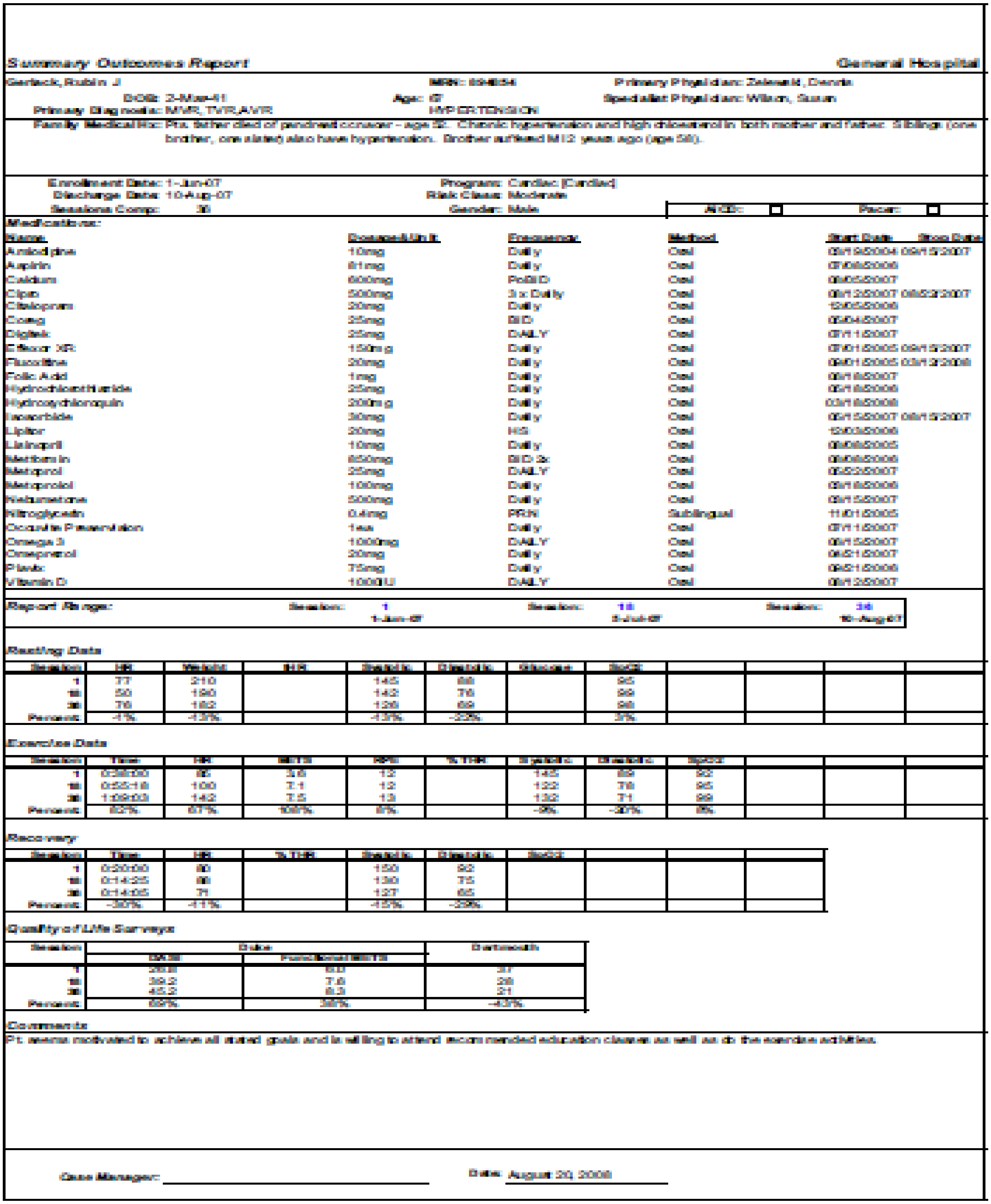
Discharge Tab Fields

Fields	Description
Reasons for discharge **End of Session** **Medical Conditions** **Cancelled Session** **Other**	Select the appropriate check box to identify the reason for discharge.
Comment	Enter a reason for discharge.
Discharge	This button discharges the patient.
Discharge Action	
Billable	A checkmark indicates the session is billable (system default).
Queue for charting and editing	A checkmark indicates the patient will be added to the charting and editing list when the patient is discharged.
Print Reports	For each report type: 1. Select the check box for the printer icon, to send the report to the printer. 2. Select the check box for the PDF icon to save the report as a PDF.
Session Summary	A summary of the recorded Rest and Recovery parameter data and the minimum, maximum and average of the recorded Exercise parameter data. The report also includes three ECG strips (if stored), one each from Rest, Exercise, and Recovery. The Rest and Recovery strips are the stored strips with the lowest heart rate for the modality, and the Exercise strip is the stored strip with the highest heart rate for all exercise modalities.
Session Report	The Session Report is a multi-page report with all completed modalities and associated parameter data recorded during the session, including all ECG strips.
Full Disclosure	The Full Disclosure report is a compressed plot of the full disclosure data for one lead. The report compresses 60 seconds of data per line and annotates each line with the relative time of the recording and the calculated heart rate. Alarm conditions and stored strips are not annotated on the Full Disclosure Report.
QExchange	
Export Session Data	A checkmark indicates the system will export session data plus basic demographics data for this patient.
Session Summary PDF	A checkmark indicates the system also exports a session summary PDF file for this patient.
Session Report PDF	A checkmark indicates the system also exports a session report PDF file for this patient.
Full Disclosure PDF	A checkmark indicates the system also exports the Full Disclosure data for this patient.
Full Demographics	A checkmark indicates the system exports full demographics data rather than basic demographics data for this patient.

Sample Reports

This section contains samples of the session management reports.

Figure 5 Example of the Session Summary Report



Summary Outcomes Report — General Hospital

Gerlack, Rubin J — MRN: 894854 — Primary Physician: Zelesnik, Dennis
DOB: 2-Mar-41 — Age: 67 — Specialist Physician: Wilson, Susan
Primary Diagnosis: MVR, TVR, AVR — HYPERTENSION
Family Medical Hx: Pts. father died of pancreatic cancer - age 52. Chronic hypertension and high chloesterol in both mother and father. Siblings (one brother, one sister) also have hypertension. Brother suffered MI 2 years ago (age 58).

Enrollment Date: 1-Jun-07 — Program: Cardiac [Cardiac]
Discharge Date: 10-Aug-07 — Risk Class: Moderate
Sessions Comp: 36 — Gender: Male — AICD: ☐ Pacer: ☐

Medications:

Name	Dosage&Unit	Frequency	Method	Start Date	Stop Date
Amlodipine	10mg	Daily	Oral	09/19/2004	09/15/2007
Aspirin	81mg	Daily	Oral	07/08/2006	
Calcium	600mg	PoBID	Oral	09/05/2007	
Cipro	500mg	3 x Daily	Oral	08/12/2007	08/22/2007
Citalopram	20mg	Daily	Oral	12/05/2006	
Coreg	25mg	BID	Oral	05/04/2007	
Digitek	25mg	DAILY	Oral	07/11/2007	
Effexor XR	150mg	Daily	Oral	07/01/2005	09/15/2007
Fluoxetine	20mg	Daily	Oral	09/01/2005	03/12/2006
Folic Acid	1mg	Daily	Oral	05/16/2007	
Hydrochlorothiazide	25mg	Daily	Oral	05/16/2006	
Hydroxychloroquin	200mg	Daily	Oral	03/16/2006	
Isosorbide	30mg	Daily	Oral	05/15/2007	08/15/2007
Lipitor	20mg	HS	Oral	12/03/2006	
Lisinopril	10mg	Daily	Oral	09/06/2005	
Metformin	850mg	BID 2x	Oral	09/06/2006	
Metoprol	25mg	DAILY	Oral	05/22/2007	
Metoprolol	100mg	Daily	Oral	09/16/2006	
Nabumetone	500mg	Daily	Oral	09/15/2007	
Nitroglycerin	0.4mg	PRN	Sublingual	11/01/2005	
Occuvite Preservision	1ea	Daily	Oral	07/11/2007	
Omega 3	1000mg	DAILY	Oral	05/15/2007	
Omeprazol	20mg	Daily	Oral	06/21/2007	
Plavix	75mg	Daily	Oral	06/21/2006	
Vitamin D	1000IU	DAILY	Oral	05/12/2007	

Report Range: Session: 1 (1-Jun-07) — Session: 18 (5-Jul-07) — Session: 36 (10-Aug-07)

Resting Data

Session	HR	Weight	RHR	Systolic	Diastolic	Glucose	SpO2
1	77	210		145	88		95
18	50	190		142	76		99
36	76	182		126	69		98
Percent	-1%	-13%		-13%	-22%		3%

Exercise Data

Session	Time	HR	METS	RPE	% THR	Systolic	Diastolic	SpO2
1	0:38:00	85	3.6	12		145	89	92
18	0:55:18	100	7.1	12		122	78	95
36	1:09:03	142	7.5	13		132	71	99
Percent	82%	67%	108%	8%		-9%	-20%	8%

Recovery

Session	Time	HR	% THR	Systolic	Diastolic	SpO2
1	0:20:00	80		150	92	
18	0:14:25	88		130	75	
36	0:14:05	71		127	65	
Percent	-30%	-11%		-15%	-29%	

Quality of Life Surveys

Session	Duke		Dartmouth
	DASI	Functional METS	
1	26.8	6.0	37
18	39.2	7.6	26
36	45.2	8.3	21
Percent	69%	38%	-43%

Comments

Pt. seems motivated to achieve all stated goals and is willing to attend recommended education classes as well as do the exercise activities.

Case Manager: ______________________ Date: August 20, 2008

Figure 6 Example of the Full Disclosure Report

General Hospital

Full Disclosure Report on Lead II -- Session 13 (5/21/2007 11:11:18 AM)

Name: Rubin J Gerlack **MRN:** 894854 **Gender:** Male **Age:** 67 **Enrolled:** 4/9/2007

Program: Cardiac **Risk:** Moderate **Phase:** Phase II (Monitored) **Date of Birth:** 3/2/1941

Specialist: Susan L Wilson 512- 826-7452 **Physician:** Dennis I Zelewski 251-254-8874

Goals: Healthier eating habits (fat <30% calories, fiber >8g daily, calories <2500); Lose weight (25 pounds); Quit smoking;

Diagnoses:

Date	Primary	Secondary
4/2/2007	MVR,TVR,AVR	CABG 1983
5/15/2007	HYPERTENSION	STABLE ANGINA

Medications:

Medication Name	Dosage	Frequency	Method	Date Started	Date Stopped
Amlodipine	10 mg	Daily	Oral	3/19/2004	9/15/2007
Aspirin	81 mg	Daily	Oral	7/8/2006	
Calcium	600 mg	PoBID	Oral	8/5/2007	
Cipro	500 mg	3 x Daily	Oral	8/12/2007	8/22/2007
Citalopram	20 mg	Daily	Oral	12/5/2006	
Coreg	25 mg	BID	Oral	5/4/2007	
Digitek	25 mg	DAILY	Oral	7/11/2007	
Effexor XR	150 mg	Daily	Oral	7/1/2005	9/15/2007
Fluoxitine	20 mg	Daily	Oral	9/1/2005	3/12/2008
Folic Acid	1 mg	Daily	Oral	6/18/2007	
Hydrochlorothiazide	25 mg	Daily	Oral	5/18/2006	
Hydroxychloroquin	200 mg	Daily	Oral	3/18/2008	
Isosorbide	30 mg	Daily	Oral	5/15/2007	8/15/2007
Lipitor	20 mg	HS	Oral	12/3/2006	
Lisinopril	10 mg	Daily	Oral	8/8/2005	
Metformin	850 mg	BID 2x	Oral	8/8/2006	
Metoprol	25 mg	DAILY	Oral	5/22/2007	
Metoprolol	100 mg	Daily	Oral	3/18/2006	
Nebumetone	500 mg	Daily	Oral	3/15/2007	
Nitroglycerin	0.4 mg	PRN	Subli ngual	11/1/2005	
Occuvite Preservision	1 ea	Daily	Oral	7/11/2007	
Omega 3	1000 mg	DAILY	Oral	6/15/2007	
Omeprezol	20 mg	Daily	Oral	4/21/2007	
Plavix	75 mg	Daily	Oral	9/21/2006	
Vitamin D	1000 IU	DAILY	Oral	8/12/2007	

Discharge as: End of Session

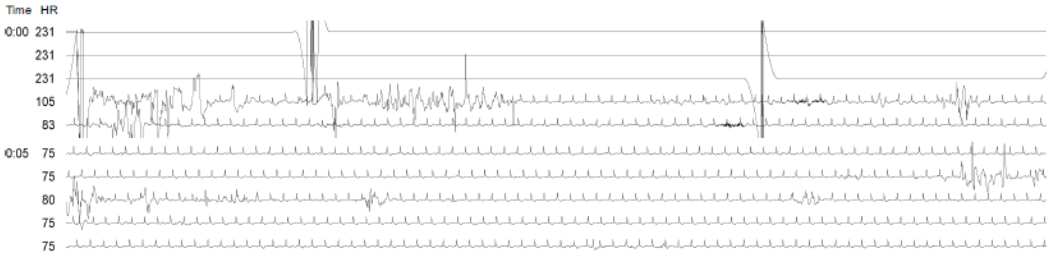


Figure 7 Example of the Session Report

General Hospital

Session Report -- Session 13 5/21/2007 11:11:18 AM

Name: Rubin J Gerlack **MRN:** 894854 **Gender:** Male **Age:** 67 **Enrolled:** 4/9/2007
Program: Cardiac **Risk:** Moderate **Phase:** Phase II (Monitored) **Date of Birth:** 3/2/1941
Specialist: Susan L Wilson 512- 826-7452 **Physician:** Dennis I Zelewski 251-254-8874
Goals: Healthier eating habits (fat <30% calories, fiber >8g daily, calories <2500); Lose weight (25 pounds); Quit smoking;

Diagnoses:

Date	Primary	Secondary
4/2/2007	MVR,TVR,AVR	CABG 1983
5/15/2007	HYPERTENSION	STABLE ANGINA

Medications:

Medication Name	Dosage	Frequency	Method	Date Started	Date Stopped
Amlodipine	10 mg	Daily	Oral	3/19/2004	9/15/2007
Aspirin	81 mg	Daily	Oral	7/8/2006	
Calcium	600 mg	PoBID	Oral	8/5/2007	
Cipro	500 mg	3 x Daily	Oral	8/12/2007	8/22/2007
Citalopram	20 mg	Daily	Oral	12/5/2006	
Coreg	25 mg	BID	Oral	5/4/2007	
Digitek	25 mg	DAILY	Oral	7/11/2007	
Effexor XR	150 mg	Daily	Oral	7/1/2005	9/15/2007
Fluoxitine	20 mg	Daily	Oral	9/1/2005	3/12/2008
Folic Acid	1 mg	Daily	Oral	6/18/2007	
Hydrochlorothiazide	25 mg	Daily	Oral	5/18/2006	
Hydroxychloroquin	200 mg	Daily	Oral	3/18/2008	
Isosorbide	30 mg	Daily	Oral	5/15/2007	8/15/2007
Lipitor	20 mg	HS	Oral	12/3/2006	
Lisinopril	10 mg	Daily	Oral	8/8/2005	
Metformin	850 mg	BID 2x	Oral	8/8/2006	
Metoprol	25 mg	DAILY	Oral	5/22/2007	
Metoprolol	100 mg	Daily	Oral	3/18/2006	
Nebumetone	500 mg	Daily	Oral	3/15/2007	
Nitroglycerin	0.4 mg	PRN	Subli ngual	11/1/2005	
Occuvite Preservision	1 ea	Daily	Oral	7/11/2007	
Omega 3	1000 mg	DAILY	Oral	6/15/2007	
Omeprezol	20 mg	Daily	Oral	4/21/2007	
Plavix	75 mg	Daily	Oral	9/21/2006	
Vitamin D	1000 IU	DAILY	Oral	8/12/2007	

Resting Data:

Time	Workload	HR	BP	RPE	SpO2	tHR	Wt
10:00		75	101/63				200

Exercise Data:

Modality	Time	Workload	METS	HR	BP	RPE	SpO2	% THR
Warmup	05:00			75				
Arm Ergometer	20:00	Watts 100,Wt 200.00	6.6	90		12		
Nu-Step	29:21	Watts 60,Wt 200.00,<115	2.6	75	124/60	12		

Exercise Summary:

Tot.Time		METS	HR	BP	RPE	SpO2	% THR
54:21	Minimum	2.6	75	124/60	12		
	Average	4.6	80	124/60	12		
	Maximum	6.6	90	124/60	12		

Recovery Data:

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Figure 8 Example of the Patient Demographics Report

General Hospital

Patient Demographics Report

Last Name: Gerlack
First Name: Rubin **MI:** J
MRN: 894854
SSN: 324-03-185
Date of Birth: 3/2/1941 **Age:** 67
Height: 71 **Weight:** 194.00
Gender: Male **Ethnicity:** Caucasian
Account: C5215-5421

Address: 310 Half Way Rd
City: Sheldonville
State: Nebraska
Postal Code: 48958
Country: United States
Order Num:

Home Phone: (319) 235-8473
Work Phone:
Cell Phone:
Pager:
Fax:
Email:

Emergency Contact

Last Name: Gerlack
First Name: Sally **MI:** P
Relationship: Wife

Address: 310 Half Way Rd
City: Sheldonville
State: Nebraska
Postal Code: 48958
Country: United States

Home Phone: 319- 235-8473
Work Phone:
Cell Phone:
Pager:
Fax:
Email:

Billing

Last Name: Gerlack
First Name: Rubin **MI:** Z
Relationship: Self

Address: 310 Half Way Rd
City: Sheldonville
State: Nebraska
Postal Code: 48958
Country: United States

Home Phone: (319) 235-8473
Work Phone:
Cell Phone: 319-254-2214
Pager:
Fax:
Email:

Specialist

Last Name: Wilson
First Name: Susan **MI:** L
Provider ID: 2823475

Address: 104196 Highlands Parkway SW
City: Carlton
State: South Carolina
Postal Code: 35327
Country: United States

Home Phone:
Work Phone: 512- 826-7452
Cell Phone:
Pager:
Fax: 512-444-6408
Email:

Primary Physician

Last Name: Zelewski
First Name: Dennis **MI:** I
Provider ID: 4968

Address: 9273 Boswell Way
City: Omaha
State: Nebraska
Postal Code: 72893
Country: United States

Home Phone:
Work Phone: 251-254-8874
Cell Phone:
Pager:
Fax:
Email: DZelewski@NPG.org

Insurance Carrier

Carrier	Group	HICN	Contact Name	Phone
Alliant Health Systems	536444		Jane McIntyre	251-254-3352
Blue Cross	B5928		Paul Thomas	251-548-6654

Diagnoses:

Date	Primary	Secondary
4/2/2007	MVR,TVR,AVR	CABG 1983
5/15/2007	HYPERTENSION	STABLE ANGINA

Medications:

Medication Name	Dosage	Frequency	Method	Date Started	Date Stopped
Amlodipine	10 mg	Daily	Oral	3/19/2004	9/15/2007
Aspirin	81 mg	Daily	Oral	7/8/2006	
Calcium	600 mg	PoBID	Oral	8/5/2007	

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CHARTING AND EDITING

Use the Q-Tel RMS Charting and Editing function to:

- Review and edit a patient's session data for a completed session.
- Alter the prescription for the upcoming session.
- Change the billable status of a prior session.
- Print patient reports.

> ***NOTE**: If you have a networked Q-Tel RMS, refer to Network Operation and Workstation Capabilities for network specific functions related to the Charting and Editing component.*

Accessing Charting and Editing

To begin Charting and Editing:

1. Click the **Charting and Editing** icon.
2. Select a patient.

For instructions on searching for a specific patient, see *Patient Search Tab*.

Patient Queue

The Patient Queue is a list of patient files that the user has selected for reviewing and editing. Putting patients into the queue makes their sessions available for editing.

The Patient Queue displays in the grid on the left side of the screen. The check box in the first column signifies that you are finished editing this patient. When you switch to another component, such as Patient Information or Session Management, the patient is removed from the queue.

> ***NOTE:** When you close Q-Tel RMS, the system detects patients in the Patient Queue who have not been marked as finished, and displays a dialog box indicating that there are patients in the Charting and Editing queue and confirming that you want to exit the application.*

Icon	Label	Description
	Check Box	A checkmark indicates the charting and editing for the patient is complete.
	Select	A green arrow displays next to the name of the patient currently selected for editing.
	Clipboard Icon	Indicates how many sessions the patient has completed.
	Handshake	Indicates the number of approved sessions for the patient.

Add to Queue Tab

You can also place patients in the Patient Queue by selecting **Queue for charting and editing** when discharging a patient from an active session.

You can also double-click on the patient name in the Search results list. This places the patient in the queue and makes the patient the active patient for editing.

To place a patient in the Charting and Editing Patient Queue:

1. Click the Charting and Editing icon.
2. Select a patient. For instructions on searching for a specific patient, see *Patient Search Tab*.
3. Double-click the patient name or click **<<Add to Queue** and then click on the name in the patient queue. The patient is placed in the Patient Queue and is ready to edit.

Fields	Description
<<Add to Queue	Adds the selected patient to the Patient Queue.
Remove from Queue	Removes the checked patients from the Patient Queue.
Refresh List	This button updates the list with changes. For more information on Refresh, see *Additional Features in Patient Information*.
Patient	Displays the name of the patient.
MRN	Displays the MRN for the patient.
Completed	Indicates the number of sessions the patient has completed.
Approved	Indicates the number of sessions approved for this patient.

Session History Tab

The **Session History** tab is specific to the selected patient. The **Session History** tab displays a grid that shows all of the patient's completed sessions, starting with the most recent session. The grid indicates whether the patient was monitored in that session and whether the session was billable.

To the right of the session history grid is a report drop-down menu and a destination drop- down menu.

To print reports for a selected session:

1. Click on the session in the grid.
2. Select the report type you want to print from the drop-down menu. Selecting another type of report automatically updates the **Session** tab in Charting and Editing.

   ***NOTE**: The default report type is the Patient Session report; changing the report type changes the default report type on this machine.*

3. Select the destination:
   - **Printer**—to send the report to a printer.
   - **PDF**—to store the report as in the Adobe PDF format.

4. Click on the **Run Report** icon.

To view the data for a particular session, double-click on the session that you would like to view/edit. This takes you to the **Session** tab with the data from the selected session in view.

Fields	Description
Session	System-generated. The system displays the number of sessions for the patient.
Date	System-generated. The system displays the dated of the session.
Monitored	System-generated. The system indicates whether the session is monitored or non-monitored.
Billed	System-generated. The system indicates whether the session has been marked as billable.
Export	Select this field to export this patient. To export all patients, click the **Select All Sessions** button. **NOTE**: The **Select All Sessions** button displays only if the system is equipped with the Q-Exchange option.
Select Report	A drop-down menu of all the available reports. Selecting another type of report changes the default report type and automatically updates the **Session** tab in Charting and Editing.
Printer Acrobat PDF	A drop-down menu next to the **Run Report** icon displays the print type options for the report.
QExchange Export Data	Exports data for all patients with a checkmark in the **Export** field.
Select All Sessions	Selects all sessions for export. All sessions display a checkmark in the **Export** field.
Session Summary PDF	Select the check box to include this report as part of the exported data.
Session Report PDF	Select the check box to include this report as part of the exported data.
Full Disclosure PDF	Select the check box to include this report as part of the exported data.
Export Data into One File	Select this check box to export data to one file. If the check box is not selected, each report exports as a separate file.
Full Demographics	Select this check box to export all demographics.

Session Tab

The **Session** tab is labeled with the number of the patient's session currently available for editing. Use the **Session** tab to:

- Edit past session data.
- Edit the patient's prescription that will be used in future sessions.

Editing Past Information

The **Session** tab shows the session as it was actually run. Change the session data to ensure the results correctly represents the patient's session. For more information on changing a Modality see *Prescription (Rx) Tab*.

Caution: Cannot cancel changes.

Changes to session parameter data in Charting and Editing cannot be cancelled. Make sure you edit only the data intended to be changed.

To	Do this…
Select the session	Use the **Session** spin control at the top left of the tab. The time and date of the session displays beside the spin control, and the data on the screen updates to that session.
Change the billable status of the session	Click **Billable** or double-click the patient. A checkmark indicates the session is billable.
Change the reason for discharge	Select from the **Reason for discharge** menu.
Add comments	Enter comments in the **Comments** field.
Select and print a report	1. Select a report from the report type drop-down menu. 2. Select the report format (print or PDF) from the report format drop-down menu. Selecting another type of report automatically updates the **Session History** tab in Charting and Editing. **NOTE**: The default report type is the Patient Session report; changing the report type changes the default report type on this machine.
 Add a modality	1. Click the **Add New** icon. The system inserts a blank line above the highlighted modality. 2. Double-click in the **Modality** field and select an exercise from the drop-down menu. The exercise prescription supports up to 12 exercise activities and exercises can be repeated. 3. Edit the settings for the prescription fields.
Change a modality	1. Double-click the **Modality** field and select an exercise from the drop-down menu.
 Delete a modality	Select the modality and click the delete button.
 Change the order of the modalities	• Select the modality and then click the **Move Up** or **Move Down** arrows. **NOTE**: Rest must be the first activity in the prescription list, and Recovery must be the last activity in the list.
Add or change session parameter data	Double-click on the field and enter the new value.
Manually change a METS value	1. If the METS value was automatically calculated by the system, hold down the **Ctrl** key and double-click in the **METS** field, and then enter the new data. 2. If the modality does not have workload parameters or a METS equation, click in the METS field and type in the data. **NOTE**: If you manually change a METS value and then change a workload parameter for that modality, the system automatically calculates a new METS value. Enter the manual METS value again.

Editing the Prescription

Selecting the **Prescription** button changes the view to include the patient's future prescription. The session activity grid is truncated

On the right is the prescription for the next time the patient is admitted to an active session. The prescription portion of the screen displays its own editing tools. For information on editing the prescription, see *Prescription (Rx) Tab*. for instructions on editing the prescription

Use the **Copy** button and the **Find** button to edit the prescription.

To	Do this…
Copy an activity line from the session activity grid to the prescription grid.	• Position the cursor on the session activity line and then click the **Copy** button.
Find the first occurrence of the modality in the prescription grid that matches the selected modality in the session activity grid.	• Position the cursor on the session activity line and then click the **Find** button. The system indicates the first occurrence of the selected session activity on the prescription grid.

Full Disclosure Tab

The **Full Disclosure** tab in Charting and Editing is specific to the selected session. In Charting and Editing, you can print the Full Disclosure report from the controls, otherwise, the behavior is the same as in the Session Management component. For more information on the Full Disclosure, see *Full Disclosure Tab*.

For non-monitored patients, the **Full Disclosure** tab is labeled **Non-Monitored**.

> ***NOTE:*** *The Full Disclosure data is not available for viewing until the ECG data is copied from the Secondary Tower to the Main Tower. Selecting the* ***Full Disclosure*** *tab before the ECG data file is copied from a Secondary Tower (immediately after discharging the patient), then the* ***Full Disclosure*** *tab is greyed-out and labeled* ***FD Copying****.*
>
> ***NOTE:*** *If Q-Tel RMS detects an error in the ECG data file, the* ***Full Disclosure*** *tab is greyed-out and labeled* ***FD Suspect****. The Full Disclosure data is not available for viewing.*

Comments Tab

The **Comments** tab in Charting and Editing is similar to the **Comments** tab in the Session Management component, although any reminders that are set here appear only if you are editing the last session completed. For more information on Comments, see *Comments Tab*.

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Q-EXCHANGE

Use Q-Exchange® to import patient information from another system or to export information to another system. Once data is imported to the Q-Tel RMS system, it is available for editing. Imported data overwrites all existing data.

> ***NOTE:*** *The MRN is a unique identifier for the patient and is not available for editing.*

The Q-Tel RMS system can import:

- Patient demographics

The Q-Tel RMS system can export:

- Patient demographics
- Session data for Charting and Editing
- Session data from Session Management

Q-Exchange Import/Export Folders

The Q-Exchange import and export data folders are located on the Main Tower. The import folder contains patient demographic data. The default location is: `C:\QTelDataCenter\ImportPatients`

The export folder location is: `C:\QTelDataCenter\QTelExchangeData`

You can configure a different folder to hold the export data. The folder can be on a remote computer on the hospital domain. To configure the export folder on a computer other than the Main Tower:

1. Create a folder for the export data.
2. Open **Computer** from the windows tool bar to start **Windows Explorer.**
3. Navigate to the folder you want to share and then select the folder one level up (for example, if using C:\Program Files\Quinton\Qtel RMS\QTelExchangeData, select C:\Program Files\Quinton\Qtel RMS).
4. Right-click on the selected folder and select **Share with** and then **Advanced sharing…** from the menu. **The Properties dialog box will display with multiple tabs.**
5. Select **Advanced Sharing** from the **Sharing** tab displayed.
6. Check **Share this folder** and accept the shared name as displayed.
7. Click the **Permissions** button. The **Share Permissions Dialog** box displays. In the **Permissions for Everyone** section make sure **Full Control**, **Change**, and **Read** is checked for the **Allow** box.
8. Click **OK** on both confirmation dialog boxes.
9. Click **Close** on the Properties dialog box.
10. On the Main Tower, map the export data folder as a local drive.
11. Configure the export data folder through the Q-Tel RMS Configuration utility:
    a. Open the Q-Tel RMS Configuration utility.
    b. Click the **Exchange** tab.
    c. Click the **Browse** button and locate the export data folder.
    d. Click **Save**.
    e. Close the Q-Tel RMS Configuration utility.

Import Schema

The system defines a schema that determines the content, order, and size of each field. The data to import must match the schema for imported data.

The import schema is defined on the Q-Tel RMS application CD. The schema defines the data fields, including size and content for the patient data files.

Data Field Mapping

The schema contains four user-configurable fields:

- **Primary Physician**
- **Specialist Physician**
- **Primary Insurance**
- **Secondary Insurance**

These fields are defined in the schema but may not match the imported data. You can select the mapping for these fields based on the input data.

For example, if imported data uses *Consulting Physician* rather than *Specialist Physician*, use the Q-Tel RMS Configuration Utility to map the term *Specialist Physician* to *Consulting Physician* so the imported data will display properly on the Q-Tel RMS system.

To configure mapping:

1. Click on the **Q-Tel RMS Configuration** icon.
2. Select the **Exchange** tab. The system displays the export and import settings.
3. In the **Import Data Field Mapping** section, enter the **Import** fields that correspond to the existing fields.
4. Click **Save**.
5. Close the Configuration window.

Modifying Billing Codes

You can modify the CPT Billing Codes. To define the CPT Billing Codes:

1. Click on the **Q-Tel RMS Configuration** icon.

2. Select the **CPT Billing Code** tab. The system displays the CPT billing codes. The default billing codes are:
   - 93798—Phase II
   - 93797—Phase III

3. To change the billing code, select the billing code and enter the modification.
   To change the descriptions, select the description and enter the modification.

4. Click **Save**.

Import Window

The function of the import window is to import patient demographics. The data to import must match the schema for imported data. Connect to the system that contains the patient files and then select the data to import.

Use the Import window to edit before importing the data. This does not change the original import file.

When the system starts, it checks for files in the Import directory. If the system detects files in the Import directory, it prompts for file import.

The imported record, including the changes you have added, over-write the existing information.

The Import window has these tabs:

- **Patient Info**—Similar to the **Patient Info** tab on the **Patient Information** screen.
- **Physician**—Similar to the **Physician** tab on the **Patient Information** screen.
- **Insurance Provider**—Similar to the **Insurance** tab on the **Patient Information** screen.
- **Warning**—Displays any warnings or mismatches of import data. Check this tab to ensure the system imports all data correctly.

The Import window tabs displays fields for the import record and if a record exists for the patient in Q-Tel RMS, the Import window can display this record as well. Each tab has identical sections:

- **Import Record**—Displays the fields from the Import record.
- **Existing Record**—Displays the fields from the existing record on Q-Tel RMS. The existing record fields are for information only and will be overwritten by the import record fields

The left side of the import window displays the import list and displays the same information for all tabs.

NOTE: *Some displayed fields may be truncated.*

Field	Max Length	Description
Import List window	--	Displays the list of patients available for import. Files that display in red have an existing entry in Q-Tel RMS. Importing these files overwrites any existing entry. To select a patient for import, select the check box next to each name. To remove a patient from the import group, clear the checkmark next to the name.
Import Now	--	Starts the import of patient demographic data for all patients selected in the **Import List**.
Import Later	--	Postpones the import of patient demographic data. 1. To return to the import screen, select **File | Import** patients from the menu bar.
View Invalid Files	--	Opens a dialog box to view and delete the invalid files. Invalid files are files that the system cannot import.
Patient Info Tab		Similar to the **Patient Info** tab on the **Patient Information** Screen.
Last Name	50	Patient's last name.
First	50	Patient's first name.
MI	1	Middle initial.
MRN	25	System-generated number. MRN (Medical Record Number) uniquely identifies the patient.
SSN	11	Social Security Number.
Account	40	Account number.
Billing Code	40	Billing code.
Order Number	40	Order number.
Address	50 per line	Two lines are available for the address.
City	50	The name of the city.

Field	Max Length	Description
State	50	Drop-down menu for the state or province. (Use the Configuration Utility to edit.)
Postal Code	10	The patient's zip code.
Country	50	Drop-down menu for the country. (Use the Configuration Utility to edit.)
Date of Birth	--	The system automatically calculates age from Date of Birth (DOB).
Gender	--	Drop-down menu for patient's gender.
Home Phone	25	Contact information. **Work**
Phone	25	Contact information. **Cell**
Phone	25	Contact information.
Pager	25	Contact information.
Fax	25	Contact information.
E-mail	75	Contact information.
Ethnicity	25	Drop-down menu for patient's ethnicity.
Physician Tab		Similar to the **Physician** tab on the **Patient Information** screen. There are separate tabs for: 1. **Specialist** 2. **Primary Physician** These tabs are identical.
Last Name	50	Physician's last name.
First	50	Physician's first name.
MI	1	Middle initial.
Provider ID	20	Identification code for the provider.
Address	50 per line	Two lines are available for the address.
City	50	The name of the city.
State	50	Drop-down menu for the state or province. (Use the Configuration Utility to edit.)
Postal Code	10	The zip code.
Country	50	Drop-down menu for the state or province. (Use the Configuration Utility to edit.)
Home Phone	25	Contact information. **Work**
Phone	25	Contact information. **Cell**
Phone	25	Contact information.
Pager	25	Contact information.

Field	Max Length	Description
Fax	25	Contact information.
E-mail	75	Contact information.
Insurance Tab		Similar to the **Insurance** tab on the **Patient Information** screen. There are separate tabs for: 1. **Primary** 2. **Secondary** These tabs are identical.
Carrier	50	The patient's insurance carrier.
Group	50	Insurance group name.
HICN	50	Health Insurance Claim Number for the patient.
Contact Name	50	Insurance contact.
Phone	25	Insurance phone number.
Warning Tab		The **Warning** tab displays a system generated list of any discrepancies found in the import file. Use the **Admin Configuration** screen to correct discrepancies. The system will not import the portions of the record that contain discrepancies.

Importing Patient Files

Manual Patient File Import

When the system starts, it checks for files in the Import directory. If the system detects files in the Import directory, it displays a dialog box.

To import files when files exist in the Import directory:

1. Choose a method to begin the import process:
   - If the application is not started: start the system, a dialog box prompts you to import the files, click **Yes**.
   - If the application is running, select **File | Import Patients** from the menu bar.

If the system detects invalid files, a dialog box lists the location of the invalid files. For more information on invalid files see *Invalid Imported Files*. Note the location of the invalid files and select **OK** to dismiss the dialog box. The system displays the **Import** window.

2. For each patient to import:
   a. Click the check box next to the patient name on the left of the screen.
   b. Click on the **Patient Info**, **Physician**, and **Insurance Provider** tabs and review the information to import. If necessary, edit the information to import.
   c. View the **Warning** tab.

   If the system displays a warning, the system may not import the data correctly. Choose a method to proceed:
   - Select **Import Later**, fix the import files, and restart the import process.
   - Click in the check box to remove the checkmark for the affected patient file, import the other files, fix the import files with the error, and then restart the import process.
   - Select **Import Now** and manually correct the data once it is loaded in Q-Tel RMS.

3. To import the selected patient files, click **Import Now**. When the import is complete, the system displays a dialog box. Patients that were successfully imported display in the **Imported Patients** section. Patients that were selected for import, but not imported display in the **Patients Not Imported** section. The system displays the **Import Results** dialog box.

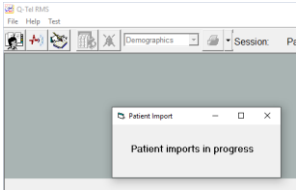
4. If there were no invalid files, click **Done**. To view the log file for the Patients not imported:
   a. Click on the patient in the list.
   b. View the invalid files to determine the error.
   c. If you are unable to determine the error, you can save the files for technical support
   d. To print a copy of the import log file, select **Print Import Log File**.
   e. To close the dialog box, click **Done**.

Automatic Patient File Import

The Main Tower can be configured to automatically import all patient files. If configured, on system startup and periodically, it checks for files in the Import directory. If the system detects files in the Import directory it automatically imports all files. Files that fail to import are moved to the **Patients Not Imported** directory.

If the system detects files in the Import directory on startup a message will be displayed indicating that Patient imports are in progress.

Imports that occur during normal operation will take place in the background with no message to the user.



To configure auto patient file import:
1. Click on the **Q-Tel RMS Configuration** icon.
2. Select the **Exchange** tab. The system displays the export and import settings.
3. In the **Automatic Import Patient Settings** section, check the **Enable Auto Import** check box and enter the **Import Period (Mins)**.

4. Click the **Save** button.
5. Close the Configuration window.

Q-Exchange Import Folders

The Q-Exchange import data folders containing patient demographic data are located on the Main Tower. The default location is: `C:\QTelDataCenter\ImportPatients`

Invalid Imported Files

The system cannot import invalid files. Invalid files include files that contain incorrect schema, duplicate data, corrupted information, or an XML error. The system detects invalid patient files and removes them from the import process.

If there are files which contain the same MRN for manual import, only the first loaded file will be used. The other files will be treated as invalid data files and not imported.

You can view the system error message and the contents of the file using the Invalid Import File List.

When the system detects an invalid file, the **View Invalid File** button displays on the Import window.
To view invalid files:
1. Start the import process. (See *Importing Patient Files*.) If the system detects invalid files, a dialog box displays listing the location of the invalid files. Note the location of the invalid files and select **OK** to dismiss the dialog box. The system displays the Import window.
2. Select **View Invalid Files**. The system displays the Invalid Import File dialog box. A list of invalid files displays at the top. Error messages, indicating the reason the file is invalid, display in the center. A representation of the file contents displays at the bottom.
3. For each invalid file:
   a. Click on the invalid file. Technical Support or your IT department can use this information to determine if the problem can be corrected.
   b. To delete the file without correction, select the **Delete** check box for the file.
4. To delete all the marked files, click the **Delete** button.
5. To close the dialog box click **Cancel**.

Exporting Patient Data

You can export:

- Patient Demographics
- Session Data for Charting and Editing
- Session data from Session Management

Exporting Patient Demographics

To select data for export:

1. Select the **Patient Information** button to preview the patient data available for export.
2. Select the patient data to export by selecting the **Export** check box on the patient list.
3. To select all displayed patients, click **Select all Patients**.
4. Select **Export Data**.

Exporting Session Data From Session Management

To select data for export at the completion of a session:

1. Select the **Discharge** tab.
2. Select **Export Session Data** from the **QExchange** section.
3. Select the type of data to export:
   - To export a summary of the session in PDF format, select **Session Summary PDF**.
   - To export a session report in PDF format, select **Session Report PDF**.
   - To export the full disclosure strips in PDF format, select **Full Disclosure PDF**.
   - To export patient demographics, select **Full Demographics**.
4. Select **Discharge**.

For more information on discharging a patient, see *Discharge Tab*. The system exports the files to the export location.

Exporting Session Data From Charting and Editing

To select data for export from Charting and Editing:

1. Add the patients to the queue. For more information on using charting and editing, see *Charting and Editing*.
2. Select the Session History tab.
3. Choose a method to select patients:
   - To export all sessions, click the **Select All Sessions** button.
   - To select an individual session, select the **Export** check box. The **Export Data** button and the export options are available.
4. Select the type of data to export:
   - To export a summary of the session in PDF format, select **Session Summary PDF**.
   - To export a session report in PDF format, select **Session Report PDF**.
   - To export the full disclosure strips in PDF format, select **Full Disclosure PDF**.
   - To export patient demographics, select **Full Demographics**.
   - To export all sessions in one file, select **Export Data Into One File**.
5. Select Export Data. The system exports the files to the export location. To change the export location see *Exchange Tab*.

Q-Exchange Viewer

The Q-Tel RMS Exchange Viewer program provides end users a way to view the patient demographics and session data exported by the Q-Exchange export function. The Exchange Viewer uses Acrobat Reader to display report PDF files and ensures the file is well-formed and complies with the Q-Exchange XML schema before displaying the file.

To view the export data:

1. Double-click the Q-Tel RMS Exchange icon or select **Start | Quinton | Q- Tel RMS Exchange Viewer | QExchangeViewer.exe**. Exchange Viewer launches Acrobat reader and automatically finds and expands the Q- Exchange data folder, if it exists. If the XML schema is invalid, Exchange Viewer displays an error dialog box.
2. To view newly exported data, double click on the root export folder and then expand the folder which holds the patient's data file.

Q-Exchange Export Folders

The Q-Exchange export data folders are located on the Main Tower. The default export folder location is: `C:\QTelDataCenter\QTelExchangeData.`

You can configure a different folder to hold the export data. The folder can be on remote computer on the hospital domain. Each user maps to the network drive and configures the export data folder.

To configure the export folder on a computer other than the Main Tower:

1. Create a folder for the export data.
2. Open **Computer**.
3. Navigate to the folder you want to share and then select the folder one level up (for example, if using C:\Program Files\Quinton\Qtel RMS\QTelExchangeData, select C:\Program Files\Quinton\Qtel RMS).
4. Right-click on the selected folder and select **Sharing and Security** from the menu.
5. Check **Share this folder** and accept the shared name as displayed.
6. Click the **Permissions** button. The **Share Permissions Dialog** box displays. In the **Permissions for Everyone** section make sure **Full Control**, **Change**, and **Read** is checked for the **Allow** box.
7. Click **OK** on both confirmation dialog boxes.
8. For each user: on the Main Tower, map the export data folder as a local drive, and check **Reconnect at logon**.
9. For each user: configure the export data folder through the Q-Tel RMS Configuration utility:
   a. Open the Q-Tel RMS Configuration utility.
   b. Click the **Exchange** tab.
   c. Click the **Browse** button and locate the export data folder.
   d. Click **Save**.
   e. Close the Q-Tel RMS Configuration utility.

   NOTE: *If the remote shared folder needs to be re-mapped due to a network connection issue, the user needs to reboot the machine after remapping the folder.*

ADMINISTRATIVE REPORTS

Use the Administrative reports to view billing, insurance, patients, and physicians.

Generating Administrative Reports

To run the Administrative Reports, click on the report icon at the top right of the Q-Tel RMS screen.

NOTE: *Administrative Reports cannot be generated when patients are admitted in Session Management.*

To generate an Administrative report:

1. Click the report icon at the top right of the Q-Tel RMS screen.
2. Select the report name. The system highlights the report. If the report has associated date criteria, the system displays date selections, use the calendar or enter the date(s). Do not enter future dates.
3. To locate a specific patient, use the selections in **Search For Patients**. For more information on searching for patients, see *Searching For A Patient*.
4. Select the features based on the report.

For these reports	Do this…
Daily Billing Insurance List Patient List Patient for Dates Physician List	1. Select the destination: • **Printer**—to send the report to a printer. • **PDF**—to store the report as in the Adobe PDF format. 2. Click on the **Send to Printer** icon to generate the report. For a networked Q-Tel RMS configuration, PDF files are stored on the Main Tower: `C:\QTelDataCenter\AdminReports`.
Patient Intake Assessment Patient Care Plan	1. To send to a printer, click **Send to Printer**. 2. To create a PDF, click **Send to Acrobat/PDF**. • PDF files are stored on the Main Tower: `C:\QTelDataCenter\AdminReports`. 3. To preview the report: a. Select the patient. Click **Report Preview**. The system displays the report preview screen. For more information see *Report Preview*.
Patient Query	1. Create the patient query list. See *Patient Query Report*. 2. To send to a printer, click **Print**. 3. To create a PDF, click **Save**. For a networked Q-Tel RMS configuration, PDF files are stored on the Main Tower: `C:\QTelDataCenter\AdminReports`. To preview the report, click Preview. The system displays the report preview screen. For more information see *Report Preview*.

Report Preview

Some reports have the report preview feature. Use report preview to view the report prior to printing or saving.

To…	Do this…
Print from print preview	Click Print.
Save as a PDF from print preview	1. Click **Save**. The system displays a confirmation dialog box indicating the location of the PDF. • For a networked Q-Tel RMS configuration, PDF files are stored on the Main Tower: `C:\QTelDataCenter\AdminReports`. 2. Click OK.
Change the magnification of the displayed report	Select the size from Zoom. Options are: • 125 • 100 • 75 • 50
Page through the report	Click the forward and back scroll arrows.
Go to a specific page	Enter the page number in the **Page** field and then click **Go**.
Exit print preview	Click **Close Preview**.

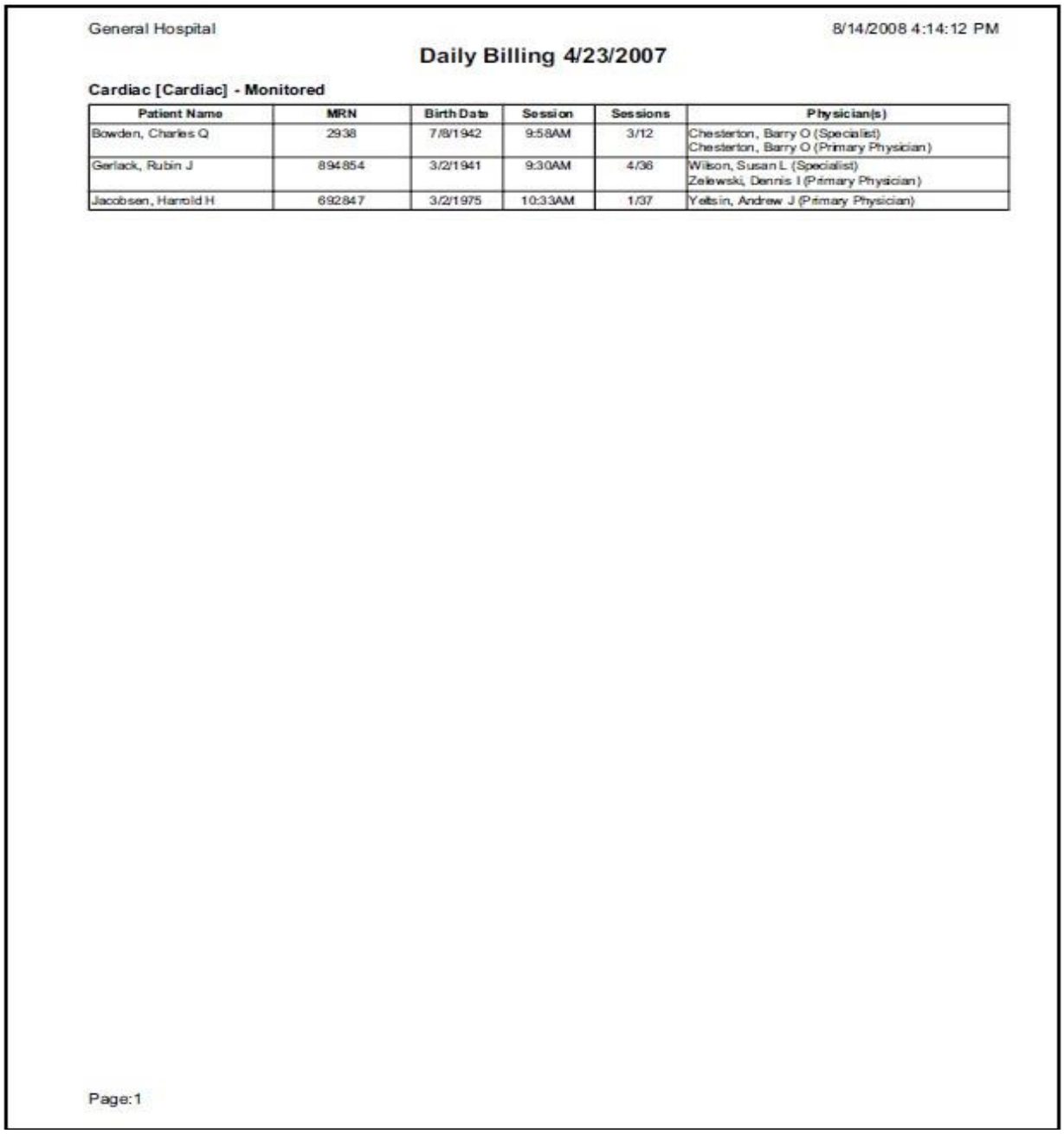
Administrative Reports

The reports in this section are available through Administrative Reports.

Daily Billing

The Daily Billing report lists all billable sessions that occurred for the selected date.

Figure 9 Example of the Daily Billing Report



General Hospital 8/14/2008 4:14:12 PM

Daily Billing 4/23/2007

Cardiac [Cardiac] - Monitored

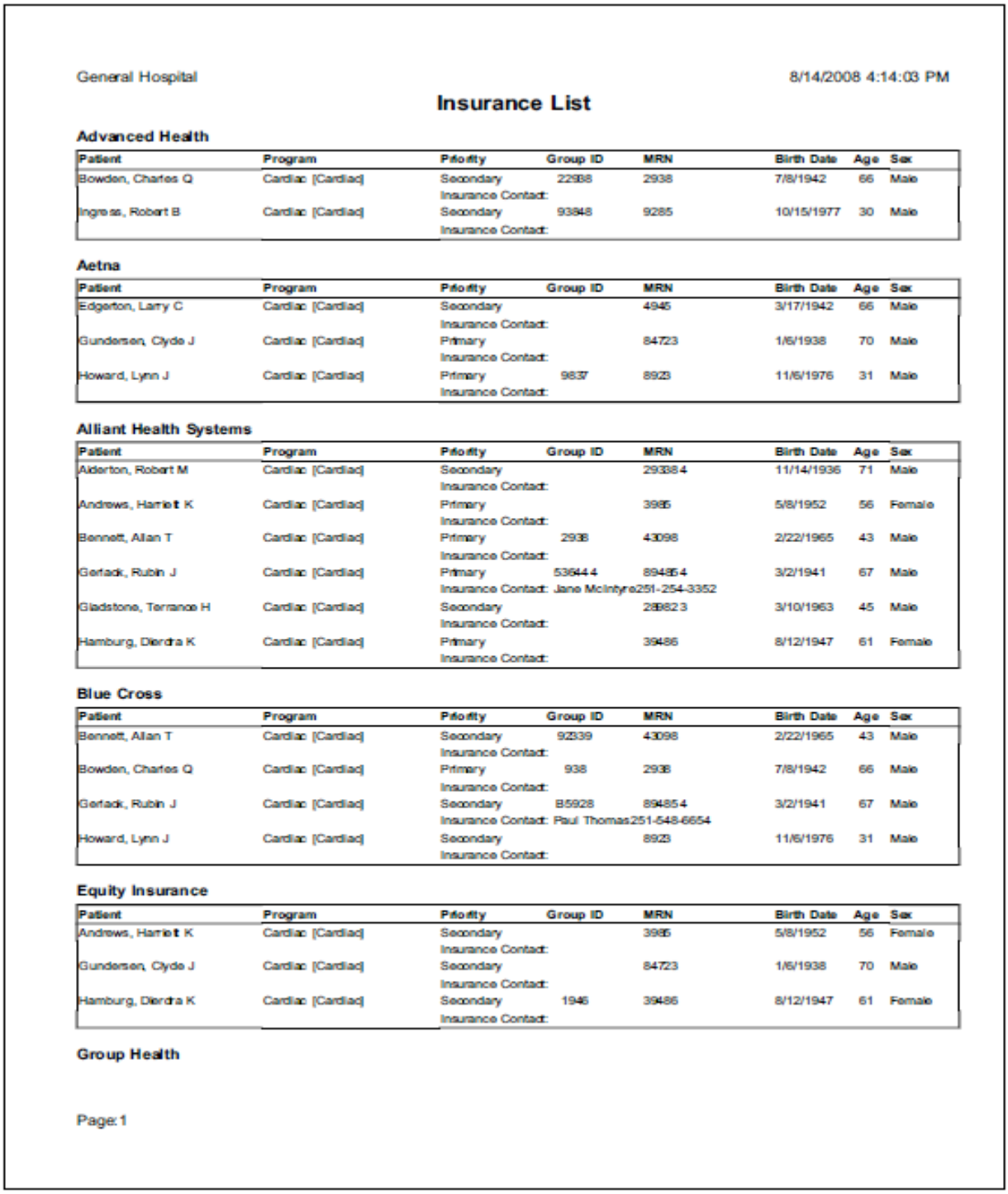
Patient Name	MRN	Birth Date	Session	Sessions	Physician(s)
Bowden, Charles Q	2938	7/8/1942	9:58AM	3/12	Chesterton, Barry O (Specialist) Chesterton, Barry O (Primary Physician)
Gerlack, Rubin J	894854	3/2/1941	9:30AM	4/36	Wilson, Susan L (Specialist) Zelewski, Dennis I (Primary Physician)
Jacobsen, Harrold H	892847	3/2/1975	10:33AM	1/37	Yeltsin, Andrew J (Primary Physician)

Page: 1

Insurance List

This report prints a list of insurance carriers and the active patients associated with each carrier.

Figure 10 Example of Insurance List Report



General Hospital 8/14/2008 4:14:03 PM

Insurance List

Advanced Health

Patient	Program	Priority	Group ID	MRN	Birth Date	Age	Sex
Bowden, Charles Q	Cardiac [Cardiac]	Secondary	22988	2938	7/8/1942	66	Male
		Insurance Contact:					
Ingress, Robert B	Cardiac [Cardiac]	Secondary	93848	9285	10/15/1977	30	Male
		Insurance Contact:					

Aetna

Patient	Program	Priority	Group ID	MRN	Birth Date	Age	Sex
Edgerton, Larry C	Cardiac [Cardiac]	Secondary		4945	3/17/1942	66	Male
		Insurance Contact:					
Gundersen, Clyde J	Cardiac [Cardiac]	Primary		84723	1/6/1938	70	Male
		Insurance Contact:					
Howard, Lynn J	Cardiac [Cardiac]	Primary	9837	8923	11/6/1976	31	Male
		Insurance Contact:					

Alliant Health Systems

Patient	Program	Priority	Group ID	MRN	Birth Date	Age	Sex
Alderton, Robert M	Cardiac [Cardiac]	Secondary		293384	11/14/1936	71	Male
		Insurance Contact:					
Andrews, Harriett K	Cardiac [Cardiac]	Primary		3985	5/8/1952	56	Female
		Insurance Contact:					
Bennett, Allan T	Cardiac [Cardiac]	Primary	2938	43098	2/22/1965	43	Male
		Insurance Contact:					
Gerlack, Rubin J	Cardiac [Cardiac]	Primary	536444	894854	3/2/1941	67	Male
		Insurance Contact:	Jane McIntyre	251-254-3352			
Gladstone, Terrance H	Cardiac [Cardiac]	Secondary		289823	3/10/1963	45	Male
		Insurance Contact:					
Hamburg, Dierdra K	Cardiac [Cardiac]	Primary		39486	8/12/1947	61	Female
		Insurance Contact:					

Blue Cross

Patient	Program	Priority	Group ID	MRN	Birth Date	Age	Sex
Bennett, Allan T	Cardiac [Cardiac]	Secondary	92339	43098	2/22/1965	43	Male
		Insurance Contact:					
Bowden, Charles Q	Cardiac [Cardiac]	Primary	938	2938	7/8/1942	66	Male
		Insurance Contact:					
Gerlack, Rubin J	Cardiac [Cardiac]	Secondary	B5928	894854	3/2/1941	67	Male
		Insurance Contact:	Paul Thomas	251-548-6654			
Howard, Lynn J	Cardiac [Cardiac]	Secondary		8923	11/6/1976	31	Male
		Insurance Contact:					

Equity Insurance

Patient	Program	Priority	Group ID	MRN	Birth Date	Age	Sex
Andrews, Harriett K	Cardiac [Cardiac]	Secondary		3985	5/8/1952	56	Female
		Insurance Contact:					
Gundersen, Clyde J	Cardiac [Cardiac]	Secondary		84723	1/6/1938	70	Male
		Insurance Contact:					
Hamburg, Dierdra K	Cardiac [Cardiac]	Secondary	1946	39486	8/12/1947	61	Female
		Insurance Contact:					

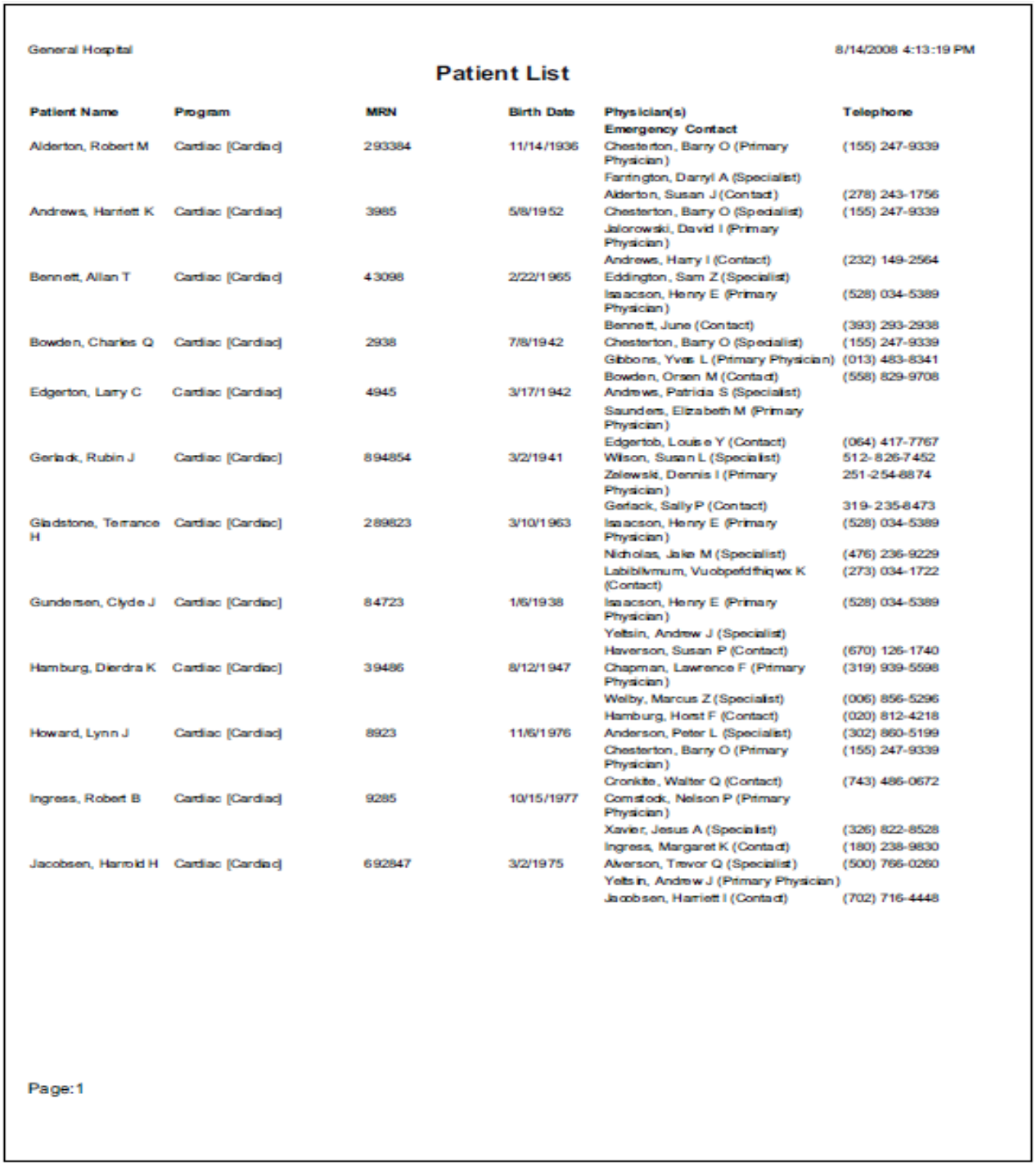
Group Health

Page: 1

Patient List

The Patient List report lists all active patients with physician and emergency contact information.

Figure 11 Example of the Patient List Report



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Patient List

Patient Name	Program	MRN	Birth Date	Physician(s) Emergency Contact	Telephone
Alderton, Robert M	Cardiac [Cardiac]	293384	11/14/1936	Chesterton, Barry O (Primary Physician)	(155) 247-9339
				Farrington, Darryl A (Specialist)	
				Alderton, Susan J (Contact)	(278) 243-1756
Andrews, Harriett K	Cardiac [Cardiac]	3985	5/8/1952	Chesterton, Barry O (Specialist)	(155) 247-9339
				Jalorowski, David I (Primary Physician)	
				Andrews, Harry I (Contact)	(232) 149-2564
Bennett, Allan T	Cardiac [Cardiac]	43098	2/22/1965	Eddington, Sam Z (Specialist)	
				Isaacson, Henry E (Primary Physician)	(528) 034-5389
				Bennett, June (Contact)	(393) 293-2938
Bowden, Charles Q	Cardiac [Cardiac]	2938	7/8/1942	Chesterton, Barry O (Specialist)	(155) 247-9339
				Gibbons, Yves L (Primary Physician)	(013) 483-8341
				Bowden, Orsen M (Contact)	(558) 829-9708
Edgerton, Larry C	Cardiac [Cardiac]	4945	3/17/1942	Andrews, Patricia S (Specialist)	
				Saunders, Elizabeth M (Primary Physician)	
				Edgerton, Louise Y (Contact)	(064) 417-7767
Gerlack, Rubin J	Cardiac [Cardiac]	894854	3/2/1941	Wilson, Susan L (Specialist)	512-826-7452
				Zelewski, Dennis I (Primary Physician)	251-254-8874
				Gerlack, Sally P (Contact)	319-235-8473
Gladstone, Terrance H	Cardiac [Cardiac]	289823	3/10/1963	Isaacson, Henry E (Primary Physician)	(528) 034-5389
				Nicholas, Jake M (Specialist)	(476) 236-9229
				Labibilvmum, Vuobpefdfhiqwx K (Contact)	(273) 034-1722
Gundersen, Clyde J	Cardiac [Cardiac]	84723	1/6/1938	Isaacson, Henry E (Primary Physician)	(528) 034-5389
				Yeltsin, Andrew J (Specialist)	
				Haverson, Susan P (Contact)	(670) 126-1740
Hamburg, Dierdra K	Cardiac [Cardiac]	39486	8/12/1947	Chapman, Lawrence F (Primary Physician)	(319) 939-5598
				Welby, Marcus Z (Specialist)	(006) 856-5296
				Hamburg, Horst F (Contact)	(020) 812-4218
Howard, Lynn J	Cardiac [Cardiac]	8923	11/6/1976	Anderson, Peter L (Specialist)	(302) 860-5199
				Chesterton, Barry O (Primary Physician)	(155) 247-9339
				Cronkite, Walter Q (Contact)	(743) 486-0672
Ingress, Robert B	Cardiac [Cardiac]	9285	10/15/1977	Comstock, Nelson P (Primary Physician)	
				Xavier, Jesus A (Specialist)	(326) 822-8528
				Ingress, Margaret K (Contact)	(180) 238-9830
Jacobsen, Harrold H	Cardiac [Cardiac]	692847	3/2/1975	Alverson, Trevor Q (Specialist)	(500) 766-0260
				Yeltsin, Andrew J (Primary Physician)	
				Jacobsen, Harriett I (Contact)	(702) 716-4448

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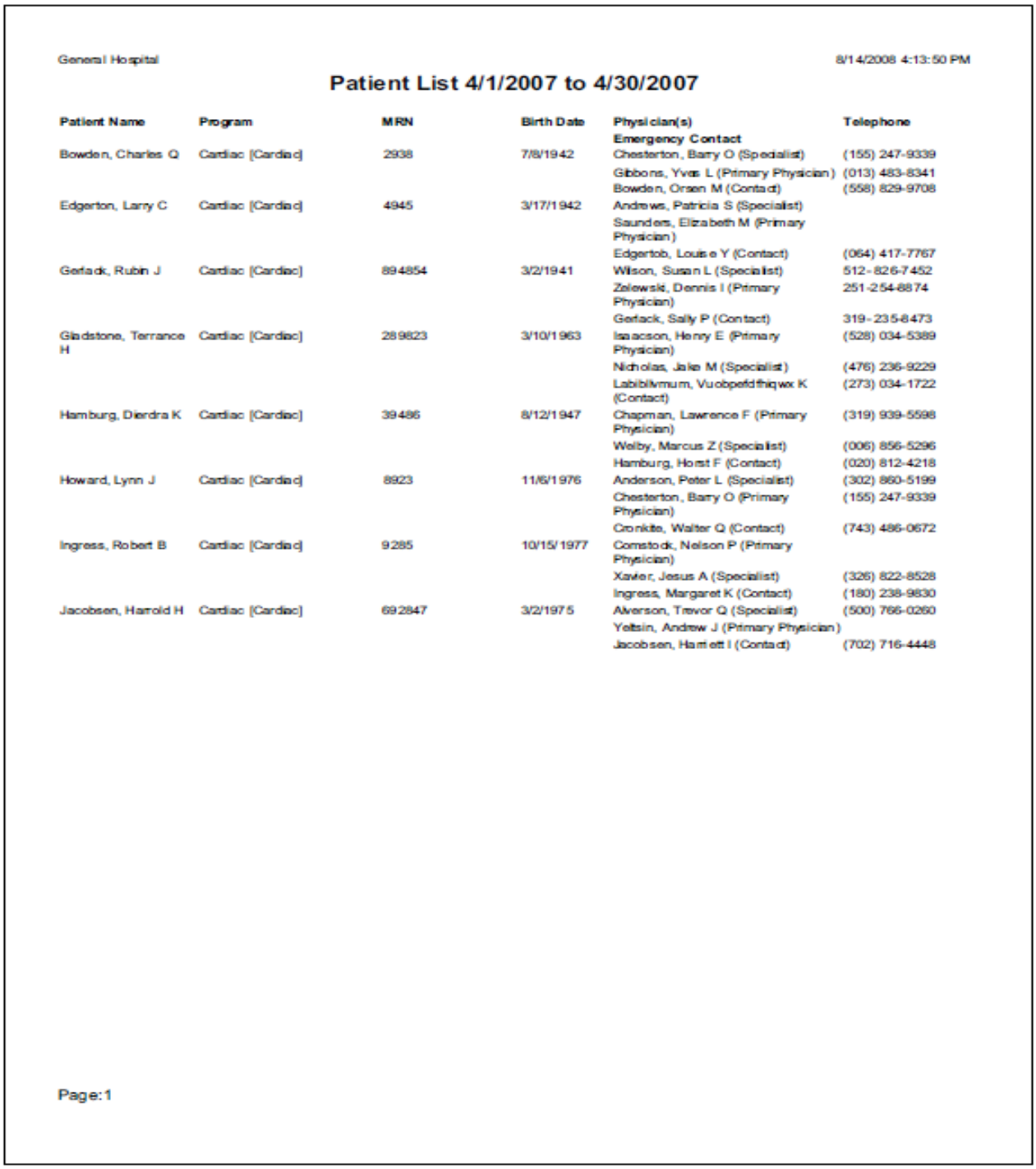
Patients for Dates

This report lists all patient who were admitted to sessions in the date range specified.

Figure 12 Example of a Patient List Report for a Selected Date Range



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Patient List 4/1/2007 to 4/30/2007

Patient Name	Program	MRN	Birth Date	Physician(s) Emergency Contact	Telephone
Bowden, Charles Q	Cardiac [Cardiac]	2938	7/8/1942	Chesterton, Barry O (Specialist)	(155) 247-9339
				Gibbons, Yves L (Primary Physician)	(013) 483-8341
				Bowden, Orsen M (Contact)	(558) 829-9708
Edgerton, Larry C	Cardiac [Cardiac]	4945	3/17/1942	Andrews, Patricia S (Specialist)	
				Saunders, Elizabeth M (Primary Physician)	
				Edgertob, Louise Y (Contact)	(064) 417-7767
Gerlack, Rubin J	Cardiac [Cardiac]	894854	3/2/1941	Wilson, Susan L (Specialist)	512-826-7452
				Zolewski, Dennis I (Primary Physician)	251-254-8874
				Gerlack, Sally P (Contact)	319-235-8473
Gladstone, Terrance H	Cardiac [Cardiac]	289823	3/10/1963	Isaacson, Henry E (Primary Physician)	(528) 034-5389
				Nicholas, Jake M (Specialist)	(476) 236-9229
				Labiblvmum, Vuobpefdfhiqwx K (Contact)	(273) 034-1722
Hamburg, Dierdra K	Cardiac [Cardiac]	39486	8/12/1947	Chapman, Lawrence F (Primary Physician)	(319) 939-5598
				Welby, Marcus Z (Specialist)	(006) 856-5296
				Hamburg, Horst F (Contact)	(020) 812-4218
Howard, Lynn J	Cardiac [Cardiac]	8923	11/6/1976	Anderson, Peter L (Specialist)	(302) 860-5199
				Chesterton, Barry O (Primary Physician)	(155) 247-9339
				Cronkite, Walter Q (Contact)	(743) 486-0672
Ingress, Robert B	Cardiac [Cardiac]	9285	10/15/1977	Comstock, Nelson P (Primary Physician)	
				Xavier, Jesus A (Specialist)	(326) 822-8528
				Ingress, Margaret K (Contact)	(180) 238-9830
Jacobsen, Harrold H	Cardiac [Cardiac]	692847	3/2/1975	Alverson, Trevor Q (Specialist)	(500) 766-0260
				Yeltsin, Andrew J (Primary Physician)	
				Jacobsen, Harriett I (Contact)	(702) 716-4448

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Physician List

This report shows all physicians in the Q-Tel RMS system and lists their active patients.

Figure 13 Example of the Physician List Report

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Physician List

Physician Name: Alverson, Trevor Q
Office: (500) 766-0260 **Pager:** **Cell:**

Patient Name	Birth Date	Age	Emergency Contact	Phone
Jacobsen, Harrold H	3/2/1975	33	Jacobsen, Harriett	(702) 716-4448

Physician Name: Anderson, Peter L
Office: (302) 860-5199 **Pager:** **Cell:**

Patient Name	Birth Date	Age	Emergency Contact	Phone
Howard, Lynn J	11/6/1976	31	Cronkite, Walter	(743) 486-0672

Physician Name: Andrews, Patricia S
Office: **Pager:** **Cell:**

Patient Name	Birth Date	Age	Emergency Contact	Phone
Edgerton, Larry C	3/17/1942	66	Edgertob, Louise	(064) 417-7767

Physician Name: Chapman, Lawrence F
Office: (319) 939-5598 **Pager:** **Cell:**

Patient Name	Birth Date	Age	Emergency Contact	Phone
Hamburg, Dierdra K	8/12/1947	61	Hamburg, Horst	(020) 812-4218

Physician Name: Chesterton, Barry O
Office: (155) 247-9339 **Pager:** (945) 740-1757 **Cell:**

Patient Name	Birth Date	Age	Emergency Contact	Phone
Alderton, Robert M	11/14/1936	71	Alderton, Susan	(278) 243-1756
Andrews, Harriett K	5/8/1952	56	Andrews, Harry	(232) 149-2564
Bowden, Charles Q	7/8/1942	66	Bowden, Orsen	(558) 829-9708
Howard, Lynn J	11/6/1976	31	Cronkite, Walter	(743) 486-0672

Physician Name: Comstock, Nelson P
Office: **Pager:** **Cell:**

Patient Name	Birth Date	Age	Emergency Contact	Phone
Ingress, Robert B	10/15/1977	30	Ingress, Margaret	(180) 238-9830

Physician Name: Eddington, Sam Z
Office: **Pager:** **Cell:**

Patient Name	Birth Date	Age	Emergency Contact	Phone
Bennett, Allan T	2/22/1965	43	Bennett, June	(393) 293-2938

Physician Name: Farrington, Darryl A
Office: **Pager:** **Cell:**

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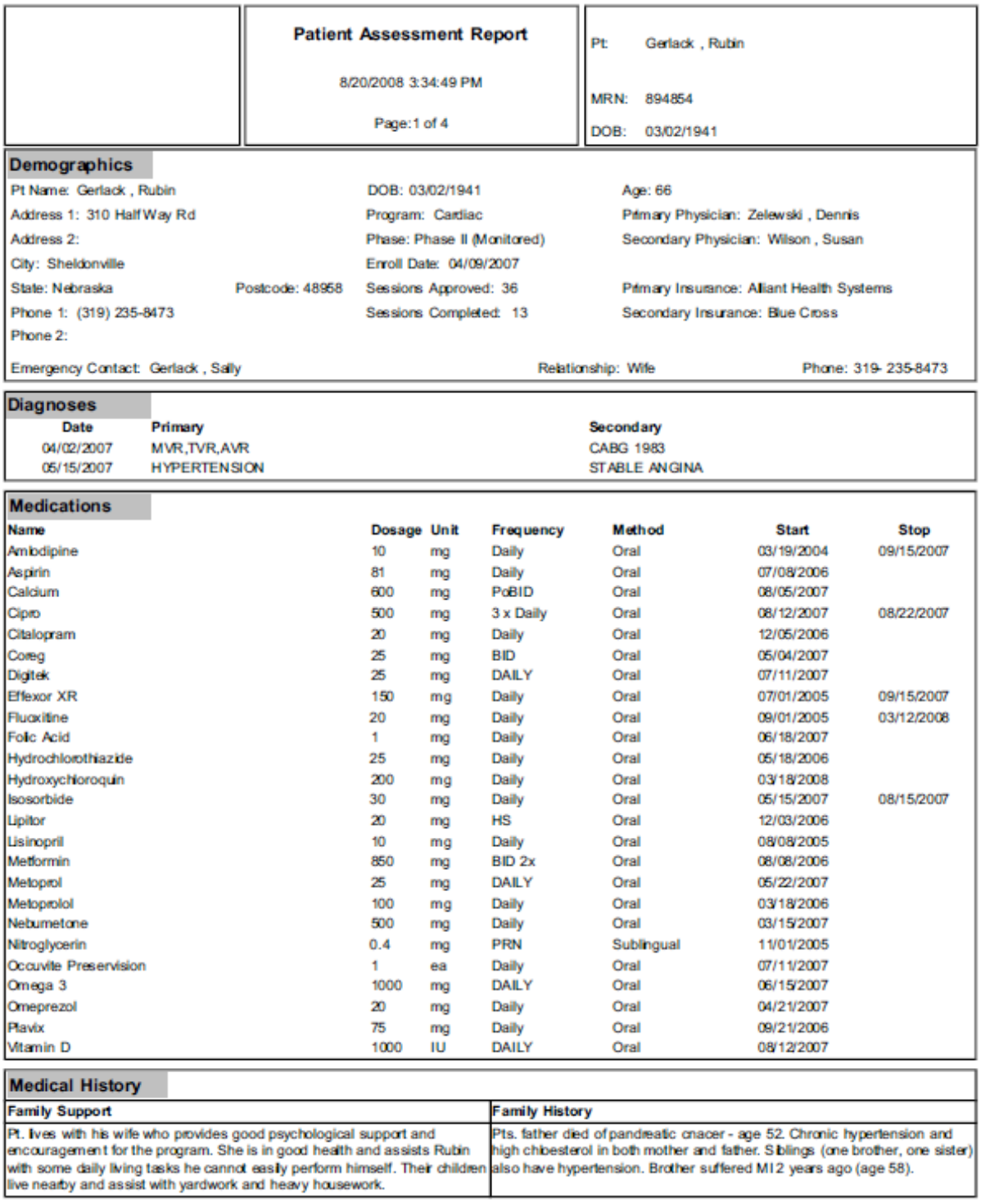
Patient Intake Assessment

This report is a detailed patient assessment.

Figure 14 Example of Patient Intake Assessment Report (page 1)



Patient Assessment Report

8/20/2008 3:34:49 PM

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Pt: Gerlack , Rubin

MRN: 894854

DOB: 03/02/1941

Demographics

Pt Name: Gerlack , Rubin		DOB: 03/02/1941	Age: 66
Address 1: 310 Half Way Rd		Program: Cardiac	Primary Physician: Zelewski , Dennis
Address 2:		Phase: Phase II (Monitored)	Secondary Physician: Wilson , Susan
City: Sheldonville		Enroll Date: 04/09/2007	
State: Nebraska	Postcode: 48958	Sessions Approved: 36	Primary Insurance: Alliant Health Systems
Phone 1: (319) 235-8473		Sessions Completed: 13	Secondary Insurance: Blue Cross
Phone 2:			
Emergency Contact: Gerlack , Sally		Relationship: Wife	Phone: 319- 235-8473

Diagnoses

Date	Primary	Secondary
04/02/2007	MVR,TVR,AVR	CABG 1983
05/15/2007	HYPERTENSION	STABLE ANGINA

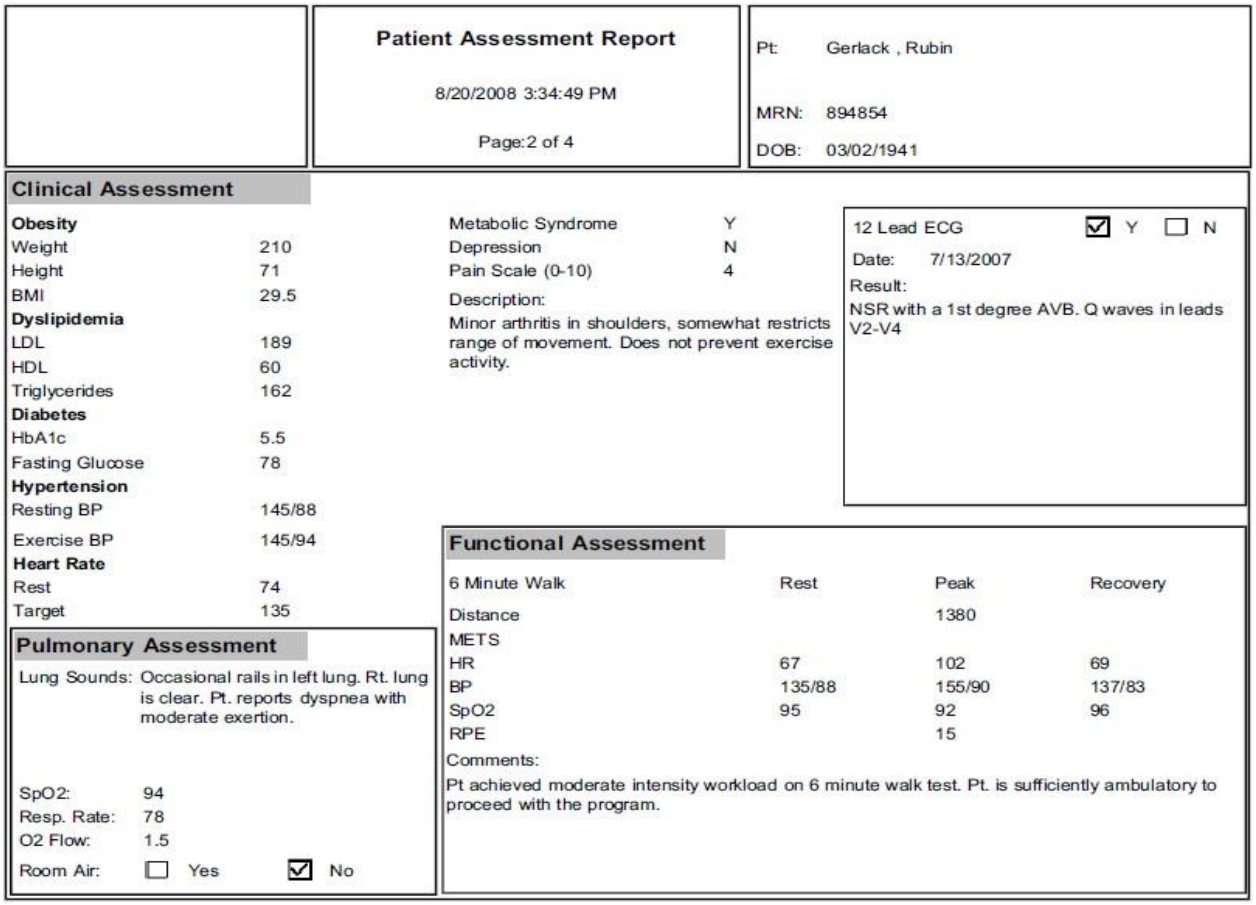
Medications

Name	Dosage	Unit	Frequency	Method	Start	Stop
Amlodipine	10	mg	Daily	Oral	03/19/2004	09/15/2007
Aspirin	81	mg	Daily	Oral	07/08/2006	
Calcium	600	mg	PoBID	Oral	08/05/2007	
Cipro	500	mg	3 x Daily	Oral	08/12/2007	08/22/2007
Citalopram	20	mg	Daily	Oral	12/05/2006	
Coreg	25	mg	BID	Oral	05/04/2007	
Digitek	25	mg	DAILY	Oral	07/11/2007	
Effexor XR	150	mg	Daily	Oral	07/01/2005	09/15/2007
Fluoxitine	20	mg	Daily	Oral	09/01/2005	03/12/2008
Folic Acid	1	mg	Daily	Oral	06/18/2007	
Hydrochlorothiazide	25	mg	Daily	Oral	05/18/2006	
Hydroxychloroquin	200	mg	Daily	Oral	03/18/2008	
Isosorbide	30	mg	Daily	Oral	05/15/2007	08/15/2007
Lipitor	20	mg	HS	Oral	12/03/2006	
Lisinopril	10	mg	Daily	Oral	08/08/2005	
Metformin	850	mg	BID 2x	Oral	08/08/2006	
Metoprol	25	mg	DAILY	Oral	05/22/2007	
Metoprolol	100	mg	Daily	Oral	03/18/2006	
Nebumetone	500	mg	Daily	Oral	03/15/2007	
Nitroglycerin	0.4	mg	PRN	Sublingual	11/01/2005	
Occuvite Preservision	1	ea	Daily	Oral	07/11/2007	
Omega 3	1000	mg	DAILY	Oral	06/15/2007	
Omeprezol	20	mg	Daily	Oral	04/21/2007	
Plavix	75	mg	Daily	Oral	09/21/2006	
Vitamin D	1000	IU	DAILY	Oral	08/12/2007	

Medical History

Family Support	Family History
Pt. lives with his wife who provides good psychological support and encouragement for the program. She is in good health and assists Rubin with some daily living tasks he cannot easily perform himself. Their children live nearby and assist with yardwork and heavy housework.	Pts. father died of pandreatic cnacer - age 52. Chronic hypertension and high chloesterol in both mother and father. Siblings (one brother, one sister) also have hypertension. Brother suffered MI 2 years ago (age 58).

Figure 15 Example of Patient Intake Assessment Report (page 2)



Patient Assessment Report

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Pt: Gerlack , Rubin

MRN: 894854

DOB: 03/02/1941

Clinical Assessment

Obesity	
Weight	210
Height	71
BMI	29.5
Dyslipidemia	
LDL	189
HDL	60
Triglycerides	162
Diabetes	
HbA1c	5.5
Fasting Glucose	78
Hypertension	
Resting BP	145/88
Exercise BP	145/94
Heart Rate	
Rest	74
Target	135

Metabolic Syndrome	Y
Depression	N
Pain Scale (0-10)	4

Description:

Minor arthritis in shoulders, somewhat restricts range of movement. Does not prevent exercise activity.

12 Lead ECG ☑ Y ☐ N

Date: 7/13/2007

Result:

NSR with a 1st degree AVB. Q waves in leads V2-V4

Pulmonary Assessment

Lung Sounds: Occasional rails in left lung. Rt. lung is clear. Pt. reports dyspnea with moderate exertion.

SpO2:	94
Resp. Rate:	78
O2 Flow:	1.5

Room Air: ☐ Yes ☑ No

Functional Assessment

6 Minute Walk	Rest	Peak	Recovery
Distance		1380	
METS			
HR	67	102	69
BP	135/88	155/90	137/83
SpO2	95	92	96
RPE		15	

Comments:

Pt achieved moderate intensity workload on 6 minute walk test. Pt. is sufficiently ambulatory to proceed with the program.

Figure 16 Example of Patient Intake Assessment Report (page 3)

Patient Assessment Report

8/20/2008 3:34:49 PM

Page:3 of 4

Pt: Gerlack , Rubin

MRN: 894854

DOB: 03/02/1941

Behavioral Assessment

Nutrition

Patient follows prescribed diet: 75 %

Significant weight change in the last 12 months

Change: 25 ☑ Gain ☐ Loss

Appetite: ☑ Good ☐ Fair ☐ Poor

Vitamin supplements: ☑ Yes ☐ No

Food Allergies: Wheat, Lactose, Peanuts

☑ Dietary Counseling Indicated Date 7/13/2007

Dietary restrictions:

☑ Low salt ☐ Diabetic ☑ Low Fat/Chol

☑ Hiatal Hernia ☐ Ulcer

☑ Other: Lactose intollerant. No Diary.

Patient has problems with:

☐ Chewing ☐ Swallowing ☑ Digesting

☑ Bloating ☐ Nausea ☑ Dental ☑ SOB after meals

☑ Other: Bridgwork is not secure. Pt suffers from TMJ.

Social/Environment

Housing ☐ Apartment ☑ House ☐ Assisted Living ☑ Has help w/ yardwork ☐ Stairs to climb

Lives with: ☑ Spouse ☐ Alone ☐ Friend ☐ Other family ☐ Partner ☑ Pets

Assistive Devices: ☐ Walker ☑ Cane ☐ Wheel Chair ☑ Oxygen ☑ CPAP

Transportation: ☑ Self ☐ Public ☐ Friend/Family ☐ None

Occupation: City bus driver ☑ Retired

Risk Factors

Smoking

☐ Lives With Smoker

☑ Smoking History

Packs/Day: 2.500

Years: 35

Date Stopped:

Alcohol

Days/Week: 7

Drinks/Day: 1

Type of Alcohol:

☐ Liquor

☑ Wine

☐ Beer

Exercise

Days/Week: 2

Activity Type: Walks dogs

Intensity: Light

Minutes/Day: 16 - 30

☐ Depression ☐ Diabetes ☐ Pacemaker ☑ Hypertension ☑ Family History

☑ Sedentary Life Style ☑ Obesity ☐ Stress ☐ AICD ☑ Hyperlipidemia

☑ Drug Abuse Note: Note reported or observed.

Health Assessment

Comments:

Results of SF36 Scoring: PCS: 37.6 MCS: 39.3 Duke Activity Survey Index (DASI):26.8

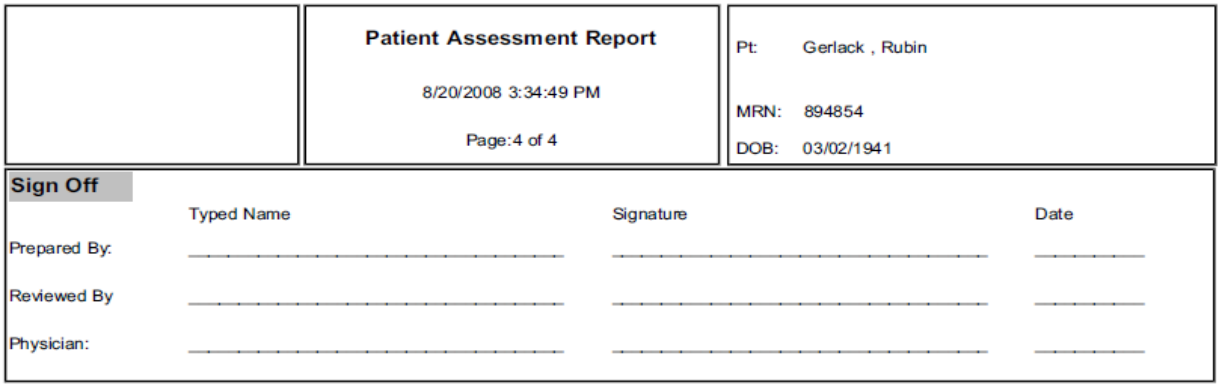
Services Assessment

#ER Visits	2	#Dr Visits	36
#Hospital Visits	2	#Medication Rx	18
Satisfaction Survey			

Comments

Pt. displays generally positive attitude about the program. He presents indications of mild depression. Family support network seems good. Diet and smoking habits need improvement (nutritional couseling and smoking cessation education are recommended).

Figure 17 Example of Patient Intake Assessment Report (page 4)



	Patient Assessment Report 8/20/2008 3:34:49 PM Page:4 of 4	Pt: Gerlack , Rubin MRN: 894854 DOB: 03/02/1941

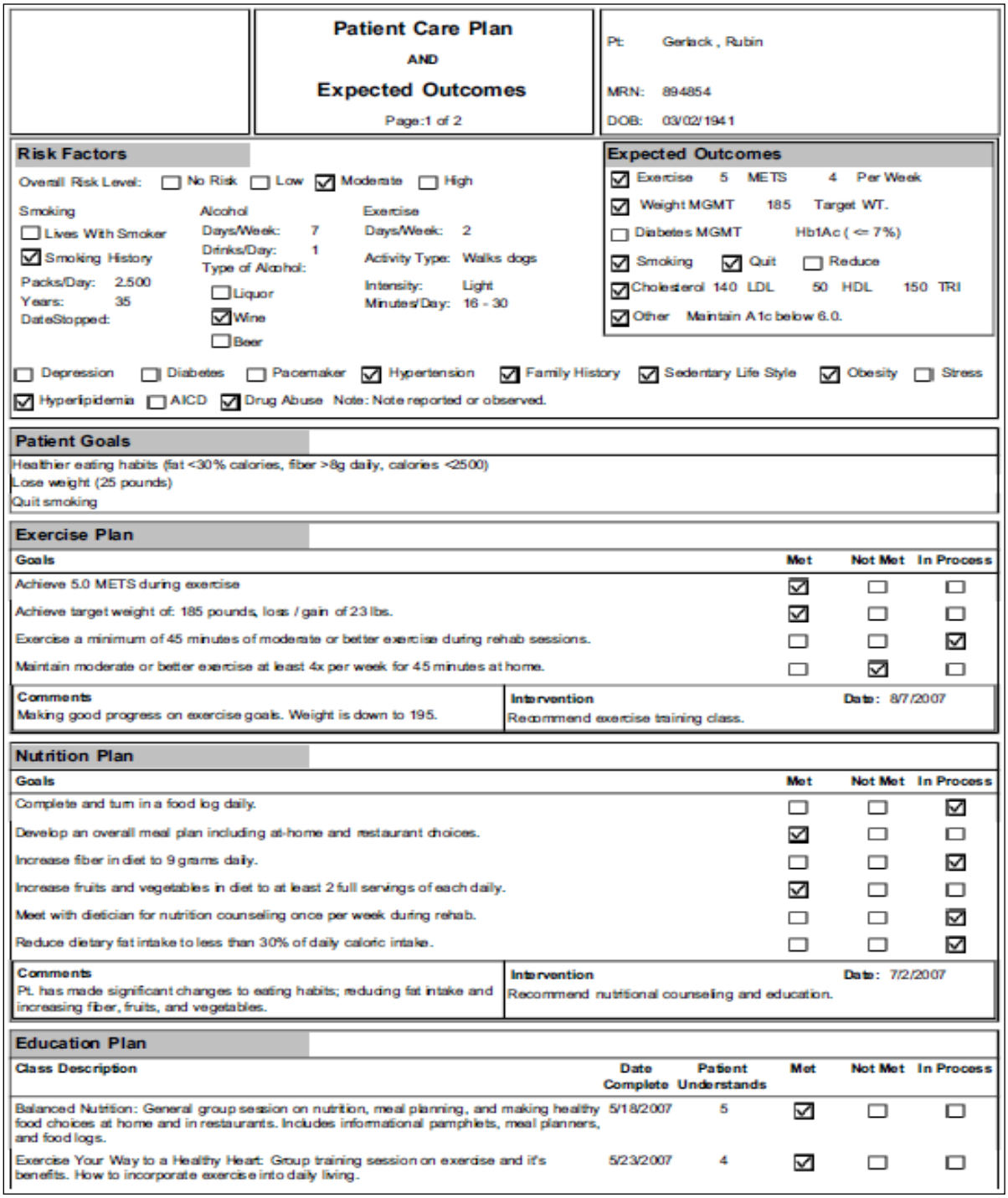
Sign Off

	Typed Name	Signature	Date
Prepared By:			
Reviewed By			
Physician:			

Patient Care Plan

The Patient Care Plan prints patient goals and outcomes.

Figure 18 Example of the Patient Care Plan Report (page 1)



Patient Care Plan
AND
Expected Outcomes
Page:1 of 2

Pt: Gerlack , Rubin
MRN: 894854
DOB: 03/02/1941

Risk Factors

Overall Risk Level: ☐ No Risk ☐ Low ☑ Moderate ☐ High

Smoking
☐ Lives With Smoker
☑ Smoking History
Packs/Day: 2.500
Years: 35
DateStopped:

Alcohol
Days/Week: 7
Drinks/Day: 1
Type of Alcohol:
☐ Liquor
☑ Wine
☐ Beer

Exercise
Days/Week: 2
Activity Type: Walks dogs
Intensity: Light
Minutes/Day: 16 - 30

Expected Outcomes

☑ Exercise 5 METS 4 Per Week
☑ Weight MGMT 185 Target WT.
☐ Diabetes MGMT Hb1Ac (<= 7%)
☑ Smoking ☑ Quit ☐ Reduce
☑ Cholesterol 140 LDL 50 HDL 150 TRI
☑ Other Maintain A1c below 6.0.

☐ Depression ☐ Diabetes ☐ Pacemaker ☑ Hypertension ☑ Family History ☑ Sedentary Life Style ☑ Obesity ☐ Stress
☑ Hyperlipidemia ☐ AICD ☑ Drug Abuse Note: Note reported or observed.

Patient Goals

Healthier eating habits (fat <30% calories, fiber >8g daily, calories <2500)
Lose weight (25 pounds)
Quit smoking

Exercise Plan

Goals	Met	Not Met	In Process
Achieve 5.0 METS during exercise	☑	☐	☐
Achieve target weight of: 185 pounds, loss / gain of 23 lbs.	☑	☐	☐
Exercise a minimum of 45 minutes of moderate or better exercise during rehab sessions.	☐	☐	☑
Maintain moderate or better exercise at least 4x per week for 45 minutes at home.	☐	☑	☐

Comments
Making good progress on exercise goals. Weight is down to 195.

Intervention **Date:** 8/7/2007
Recommend exercise training class.

Nutrition Plan

Goals	Met	Not Met	In Process
Complete and turn in a food log daily.	☐	☐	☑
Develop an overall meal plan including at-home and restaurant choices.	☑	☐	☐
Increase fiber in diet to 9 grams daily.	☐	☐	☑
Increase fruits and vegetables in diet to at least 2 full servings of each daily.	☑	☐	☐
Meet with dietician for nutrition counseling once per week during rehab.	☐	☐	☑
Reduce dietary fat intake to less than 30% of daily caloric intake.	☐	☐	☑

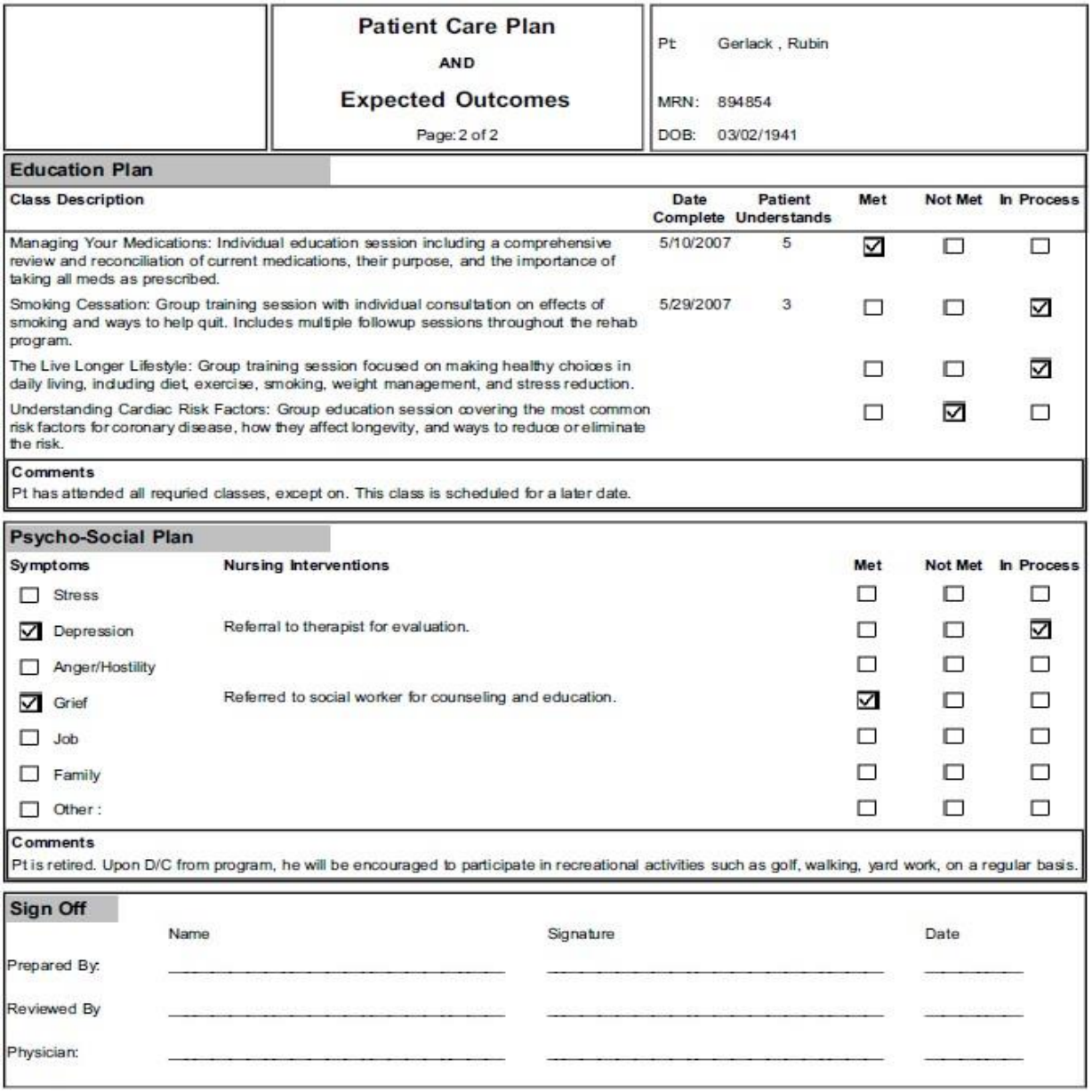
Comments
Pt. has made significant changes to eating habits; reducing fat intake and increasing fiber, fruits, and vegetables.

Intervention **Date:** 7/2/2007
Recommend nutritional counseling and education.

Education Plan

Class Description	Date Complete	Patient Understands	Met	Not Met	In Process
Balanced Nutrition: General group session on nutrition, meal planning, and making healthy food choices at home and in restaurants. Includes informational pamphlets, meal planners, and food logs.	5/18/2007	5	☑	☐	☐
Exercise Your Way to a Healthy Heart: Group training session on exercise and it's benefits. How to incorporate exercise into daily living.	5/23/2007	4	☑	☐	☐

Figure 19 Example of Patient Care Plan Report (page 2)



Patient Care Plan
AND
Expected Outcomes
Page: 2 of 2

Pt: Gerlack , Rubin
MRN: 894854
DOB: 03/02/1941

Education Plan

Class Description	Date Complete	Patient Understands	Met	Not Met	In Process
Managing Your Medications: Individual education session including a comprehensive review and reconciliation of current medications, their purpose, and the importance of taking all meds as prescribed.	5/10/2007	5	☑	☐	☐
Smoking Cessation: Group training session with individual consultation on effects of smoking and ways to help quit. Includes multiple followup sessions throughout the rehab program.	5/29/2007	3	☐	☐	☑
The Live Longer Lifestyle: Group training session focused on making healthy choices in daily living, including diet, exercise, smoking, weight management, and stress reduction.			☐	☐	☑
Understanding Cardiac Risk Factors: Group education session covering the most common risk factors for coronary disease, how they affect longevity, and ways to reduce or eliminate the risk.			☐	☑	☐

Comments
Pt has attended all requried classes, except on. This class is scheduled for a later date.

Psycho-Social Plan

Symptoms	Nursing Interventions	Met	Not Met	In Process
☐ Stress		☐	☐	☐
☑ Depression	Referral to therapist for evaluation.	☐	☐	☑
☐ Anger/Hostility		☐	☐	☐
☑ Grief	Referred to social worker for counseling and education.	☑	☐	☐
☐ Job		☐	☐	☐
☐ Family		☐	☐	☐
☐ Other :		☐	☐	☐

Comments
Pt is retired. Upon D/C from program, he will be encouraged to participate in recreational activities such as golf, walking, yard work, on a regular basis.

Sign Off

	Name	Signature	Date
Prepared By:	_____	_____	_____
Reviewed By	_____	_____	_____
Physician:	_____	_____	_____

Patient Query

The patient query report prints a list of patients based on the search criteria. The search criteria displays at the top of each page.

Figure 20 Example of the Patient Query Report

Query Criteria

Active: **Program:** **Monitored:** **Gender:**

Medication:

Enrollment Date: **Last Session Date:**

Number of Completed Sessions: **Program Complete Date:**

Weight: 1 <= Value <= 250 **Age:** 1 <= Value <= 75 **# of Billable Sessions:** 1 <= Value <= 10

Primary Insurance: **Secondary Insurance:**

Primary Physician: **Specialist:**

Primary Diagnosis: **Secondary Diagnosis:**

Risk Factors: ☐ Lives with Smoker ☐ Smoking ☐ Drink Alcohol ☐ Exercise

☐ Depression ☐ Diabetes ☐ Family History ☐ Hyperlipidemia ☐ Sedentary Life Style ☐ Hypertension

☐ Obesity ☐ Stress ☐ AICD ☐ Pacemaker

Total Patients Found: 10 **Page: 1 of 1**

Patient Name	Patient MRN
Alderton, Robert M	293384
Andrews, Harriett K	3985
Bennett, Allan T	43098
Bowden, Charles Q	2938
Edgerton, Larry C	4945
Gladstone, Terrance H	289823
Gundersen, Clyde J	84723
Hamburg, Dierdra K	39486
Howard, Lynn J	8923
Jacobsen, Harrold H	692847

Q-PROGRESS

This chapter provides instructions for using the Q-Tel RMS Q-Progress program.

WARNING! Possible misdiagnosis.

Q-Progress provides a reporting capability for the Q-Tel RMS systems. Q-Progress, however, is not a medical device. Diagnosis should be performed only with Q-Tel RMS data.

WARNING! Unintended impact to patient data.

The template has built in functions and macros to ensure proper operation. Functions can be found from the Microsoft Excel formula bar. Individual cells which are populated through Q-Tel RMS will show a formula in the entry field. Overwriting a cell's formula will cause it to no longer import its value from Q-Tel RMS. If you make any changes to the template, please verify spreadsheet operation and accuracy.

WARNING! Unintended impact to patient data.

Entering data in the wrong cells, changing or deleting any pre-programmed formulas could result in delayed or mistreatment.

The Q-Progress program is installed on your Q-Tel RMS system. Q-Progress can also be installed and run from a desktop computer that meets the minimum system requirements and is connected to the same network as your Q-Tel RMS system. A Q-Progress program installed on a computer without the Q-Tel RMS system is referred to in this manual as a Q-Progress workstation system.

Use the Q-Progress program to track and report outcome data over time for individual patients. Q-Progress provides reporting capabilities for Q-Tel RMS systems, using Microsoft Excel-based reports, charts, and graphs.

Q-Progress automatically generates pre-formatted reports and summaries for your Q-Tel RMS patient data.

NOTE: *The AACVPR Registry worksheets require an AACVPR Registry ID and Password, and an Authentication Code in order to send data to the AACVPR Cardiac and Pulmonary Outcomes Registry. Please contact AACVPR to obtain your AACVPR Registry credentials. Once you have your AACVPR Registry credentials, you may obtain an Authentication code by contacting Welch Allyn technical support and providing the last 6 digits of your AACVPR Registry. You may reach technical support by phone at 1.888.667.8272 or email at mor_tech.support@hillrom.com.*

Caution: Possible missing data.

The Q-Progress reporting application provides the user with comprehensive reports for up to a total of 36 sessions. A new program must be started when the number of sessions will exceed 36 to ensure accurate report results.

Using Q-Progress

Q-Progress provides several functions for outcomes-based reporting. Weekly Reports, Summary Reports, CMS 700 and 701 Reimbursement forms, Duke and Dartmouth Quality of Life Surveys, Individual Treatment Plans (ITPs), and Discharge Reports are all created using an Excel workbook. Q-Progress also provides capabilities to transmit data to the AACVPR Registry. Menus and toolbar buttons provide easy access to the functionality of the application.

Using the Application

To begin using Q-Progress, double-click on the Q-Progress desktop icon.

Q-Progress Patient Selection

All patients in the Q-Tel RMS database can be displayed for selection. Checkboxes allow the user to choose patient records for an action. The search functions can also be used to limit the patient list.

To select all patients:

1. Enable the **Show All Patients** checkbox in the Q-Progress main menu
2. Select the **Yes** button to dismiss the warning message
3. Select the **Search Patients** button and the list of patients will be displayed

To utilize the search functions:

- Enter the patient's **last name** and/or the patient's medical records number (**MRN**) and then select the **Search Patients** button, or
- Disable the **Ignore** checkbox next to *Completion Date* to Enter a date range for program **Completion Date** to and then select the **Search Patients** button to display all patients that completed their program within the range, or
- Disable the Ignore checkbox next to *Last Session Date* to enter a date range for **Last Session Date** and then select the **Search Patients** button to display all patients that had their last session within the range.

To Search by	Do this…
Patient name	1. Enter the patient's last name (**Lname**). 2. Click **Search Patients**. The system displays all patients with the associated string. For example, if you enter the letter "S" and click **Search Patients**, the system displays a list of all patients in the database whose last name begins with an S.
Patient MRN	• Enter the patient's medical record number (MRN) and then click **Search Patients**. The search returns all patients with the associated MRN. • To search for a specific patient, combine the last name and MRN fields.
Completed program and time range	1. Specify a date range. 2. Click **Search Patients**. For example, to display patient information on a quarterly basis, specify a date range, such as 1 Jan. 2007 to 31 March 2007. The system displays all patients that completed their program in this period.
Inactive patients (Not returning to the program)	1. Specify a date range several months previous. 2. Select all patients who had their last session within this range.
Date range: Inclusive or Exclusive	1. To exclude the date range criteria as part of the search, click the **Ignore** check box until it displays with a check mark. 2. To include the date range criteria, click the **Ignore** check box until it displays without the check mark. Unchecking the **Ignore** check boxes or doing a search with the **Show All** button checked increases the patient search time significantly.

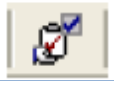
Q-Progress Toolbar Menu Options

Q-Progress features a series of top-level menu items containing related menus.

Menu	Sub Menu	Description
File	Close	Closes the Q-Progress application.
Patients	Generate Report	Generates a summary report for the currently selected patient.
	Weekly Summaries	Generates printed weekly summary report for checked patients.
	Update Excel Files	Automatically updates with the most recent data available for all checked patients. ***NOTE**: Before updating the Excel files, close all Q-Progress files on each Q- Tel RMS computer on the network.* ***NOTE**: Selecting a large number of patients, can cause the update to take several hours. To reduce system conflicts, perform the update during off-hours, such as at night or over the weekend.*
	Find	Locates a specific patient in the displayed patient list.
	Check All	Enables checkboxes for all displayed patients.
	Uncheck All	Disables checkboxes for all displayed patients.
View	Options	Displays the Options dialog for Q-Progress to specify the Storage Directory location for storing the Excel files generated by Q-Progress and the layout of the patient names in the patient index.
		Displays the Options dialog for Q-Progress to specify the layout of the patient names in the patient index.
Help	Technical Support	Displays contact information for Technical Support
	About	Display information about the application
Q-Tel Machine Name		Utilized for Q-Progress workstations only. Sets the Q-Tel RMS Main Tower that a remote workstation is networked to.

Q-Progress provides toolbar icons for quick access to commonly used functionality.

The toolbar icons offer many of the same features as the application's menus.

Icon	**Description**
	Generate Patient Report
	Generate Weekly Summaries
	Update Patient Excel Files
	Find Patient
	Quick Find Input Box (within the listed patients)
	Display Options (Storage directory and Name format)
	Display Help Contents (opens Adobe Reader)
	Set Q-Tel Machine Name (Remote Q-Progress only)
	Current Q-Tel Database Machine Name

Changing the Current Q-Tel RMS Database

Q-Progress must know the location of the Q-Tel RMS system that is being accessed to retrieve patient data. If Q-Progress is running on the Q-Tel RMS system, the database is on the same machine, and it is designated as (local). However, if the Q-Tel RMS system is on the network, remote from the user's workstation, then you must specify the machine name of the Q-Tel RMS Main Tower.

> ***NOTE:*** *For installations with multiple Q-Tel RMS Main Towers, you can access patient data on any Q-Tel RMS from your Q-Progress workstation by changing the machine name that is used by Q-Progress.*

To change the connection to the Q-Tel RMS database:

1. Select **Q-Tel Machine Name** from the menu bar or click on the **Set Q-Tel Machine Name** icon on the toolbar. The **Q-Tel machine name** dialog box displays.
2. Enter the machine name of the Q-Tel RMS Main Tower and click **OK**.

Running Q-Progress on a Remote Workstation

After changing the machine name, you can run Q-Progress on your PC workstation over the network, even though the data resides on the Q-Tel RMS. Please observe the following caution.

Caution: Possible improper system performance.

No more than two (2) concurrent users should use Q-Progress while patients are being actively monitored on the Q-Tel RMS system. A heavier user load can impact the ECG trace display

performance of the Q-Tel RMS system. DO NOT use Q-Progress if the Q-Tel RMS system is being backed-up or if the database is being restored.

Configuring the Storage Directory

Q-Progress creates patient reports using Microsoft Excel. The Excel workbooks are approximately 4 MB in size. The default storage location is the C: drive. To change the location of the storage directory:

1. Double-click on the **Q-Progress** desktop icon, or choose **Programs | Quinton | Q-Progress** from the **Start** menu.
2. Select **View | Options** from the Q-Progress menu bar. The Options dialog box displays.
3. Click the **…** (ellipses) button  at the right of the directory window to browse to the new location. When you have made the change click **OK**. Store Q-Progress reports to a folder, not the top level drive.

Caution: Possible missing data.

Q-Progress reports are included in the Q-Tel RMS backup only if they are stored to the default location on the Q-Tel RMS Main Tower. The user must manually change the location via *View → Options* to **C:\QtelDataCenter\QProgressCSVData** in order to be backed up.

Q-Progress on Multiple Workstations

When running Q-Progress from multiple workstations, set the storage directory on all Q-Progress workstations to a shared network drive. This ensures that all Q-Progress users access the same Q-Progress report. To set a shared network drive:

1. Map a network drive to a drive or folder one level above the folder where you want to store the Q-Progress Excel files.
2. In Q-Progress select the network folder where you want to store your Q-Progress Excel files (see *Configuring the Storage Directory*).

Q-Progress – Worksheet Protection

Each patient report is an individual tab within a Microsoft Excel workbook. The cells on each tab contain formulas that refer to the data stored in a hidden tab of the workbook.

For this reason, cells with formulas and calculations are protected and data cannot be manually entered. However, the user has the option to remove worksheet protection by selecting "Unprotect Sheet" in the Excel program Review Menu.

Caution: Possible improper system performance.

When worksheet protection has been removed, do not type data into a cell or manually change the contents of a cell unless you want to permanently override the displayed data on that patient's report.

Changing the contents of cells that contain formulas removes the built-in formulas. For example, if you display data for a user-selected session (e.g. Discharge Summary Report or Patient Summary Report) and you overwrite the cell formula in a cell that pertains to the session information, that change is permanent, and the cell contents no longer update based on changing the user-selected session cells. To restore the file, delete the patient Excel file and regenerate it using Q-Progress. By running the report from Q-Progress, you will rebuild the report from the Excel template, and it will regenerate the report formulas, as well as the patient data.

Q-Progress Reports

Q-Progress automatically generates pre-formatted reports and summaries of your Q-Tel RMS patient data providing a variety of patient-specific reports using a Microsoft Excel template.

- Q-Progress calculates some parameters, such as percent target heart rate, rather than using the Q-Tel RMS value. In these cases, due to rounding, the parameter value displayed in Q-Progress may differ from that in Q-Tel RMS. This difference will be no more than one unit.
- Do not mark the program as **Complete** until you have generated the necessary Q-Progress reports. Q-Progress does not update a patient's reports if the patient's program is marked **Complete** in Q-Tel RMS.
- Q-Progress updates session information for the first 36 sessions of the patient's program.

Displaying Patient Reports

To display a patient report:

1. From the main Q-Progress screen, click on the patient name. The system displays the list of programs for that patient.
2. Double-click on the program to open the Q-Progress report.

Caution: Possible improper system performance.

You must allow the report to fully generate before you click a cell on a report page, switch report pages, or select a different patient. If the report generation is interrupted, the report will not generate correctly.

Caution: Possible improper system performance.

Close any open Q-Progress report before generating another Q-Progress report. Only one Q-Progress report should be open at a time.

The Q-Progress Report includes:

- Cover Page
- CMS 700 and CMS 701 Reimbursement Forms
- Cardiac ITP
- Pulmonary ITP
- 36 Visit Report
- Blood Pressure Report
- Med Rec Report
- Discharge Summary with Graphical Trend Charts
- Patient Summary Report
- Critical Comments Report
- Session Data
- Duke Activity Status Index
- Dartmouth Quality of Life Index
- AACVPR Registry Data (Intake, Discharge and Follow-Up)

Q-Progress "Cover" Worksheet

The Cover worksheet allows the user to select which Q-Progress worksheets to display. Changes made will be used as the default setting for each new patient report created. You may revisit this cover page and amend your choices for individual patient records at any time. For example, if your site typically runs Cardiac patients, you can uncheck the "Pulmonary ITP" checkbox to disable and hide the tabs. Any of the tabs can be enabled or disabled by checkbox at any time.

CMS 700 and 701 Reports (CMS-700 and CMS-701 tabs)

The Q-Progress program assists you with the completion of the Centers for Medicare and Medicaid Services forms for reimbursement. These forms come pre-loaded with typical field entries. CMS-700 is the initial CMS form and CMS-701 is for re-certification.

Q-Progress ITP Forms

The Q-Progress reporting application provides the user with Cardiac and Pulmonary Individualized Treatment Plan (ITP) reports, required by The Centers for Medicare and Medicaid Services (CMS) and AAVCPR for program reporting. The purpose of this document is to support physician involvement in the patient's plan of care to be reviewed every 30 days until discharge from the rehabilitation program.

The Q-Progress ITP reports provide 6 tabs each to be completed by the rehab staff for both cardiac and pulmonary patients. ITP Reassessment worksheet pages 1, 2 and 3 include a **Copy to Next Sheet** button allowing you to copy data from the prior worksheet to pages 2, 3 and 4 to reduce the need for redundant data entry.

Each ITP tab covers patient assessment to include the following:

CARDIAC ITP Components

- **Exercise Assessment, Plan, Reassessment, Discharge and Follow-up**
  - Goals, Interventions, and Education
- **Nutrition Assessment, Plan, Reassessment, Discharge and Follow-up**
  - Goals, Interventions, and Education
- **Weight Management Assessment, Plan, Reassessment, Discharge and Follow-up**
  - Goals, Interventions, and Education
- **Lipid Management Assessment, Plan, Reassessment, Discharge and Follow-up**
  - Goals, Interventions, and Education
- **Psychosocial Assessment, Plan, Reassessment, Discharge and Follow-up**
  - Goals, Interventions, and Education
- **Diabetes Assessment, Plan, Reassessment, Discharge and Follow-up**
  - Goals, Interventions, and Education
- **Other Core Component Assessments, Plans, Reassessments, Discharge and Follow-up as appropriate** (Hypertension and Tobacco)
  - Goals, Interventions, and Education
- **Adverse Events**

PULMONARY ITP COMPONENTS

- **Exercise Assessment, Plan, Reassessment, Discharge and Follow-up**
  - Goals, Interventions, and Education
- **Oxygen (O2) Assessment, Use and Titration Plan, Reassessment, Discharge and Follow-up**
  - Goals, Interventions, and Education
- **Psychosocial Assessment, Plan, Reassessment, Discharge and Follow-up**
  - Goals, Interventions, and Education
- **Nutrition Assessment, Plan, Reassessment, Discharge and Follow-up**
  - Goals, Interventions, and Education
- **Other Core Component Assessments, Plans, Reassessments, Discharge and Follow-up as appropriate** (Medication, Management of Chronic Lung Disease, and Tobacco)
  - Goals, Interventions, and Education
- **Adverse Events**

Individualized Treatment Plans (ITPs) consist of the following pages:

- Initial Assessment: Completed when a patient starts the program and intended to report the initial assessment values. This page includes a signature line for staff approval.
- Reassessment 1: A 30-day follow up to the initial assessment that includes a signature line for staff approval.
- Reassessment 2: A 60-day follow up to the 30-day reassessment 1 that includes a signature line for staff approval.
- Reassessment 3: A 90-day follow up to the 60-day reassessment 2 that includes a signature line for staff approval.
- Reassessment 4: A 120-day follow up to the 90-day assessment that includes a signature line for staff approval.
- Discharge: A final follow-up to the 120-day assessment that includes a signature line for staff approval.
- Follow-up: A final follow up to the previous discharge assessment, with a duration determined by the facility, that includes a signature line for staff approval.

The worksheets include:

- Cardiac – Initial
- Cardiac – Reassessment 1
- Cardiac- Reassessment 2
- Cardiac- Reassessment 3
- Cardiac- Reassessment 4
- Cardiac – Discharge
- Cardiac- Follow-up
- Pulmonary- Initial
- Pulmonary Reassessment 1
- Pulmonary Reassessment 2
- Pulmonary Reassessment 3
- Pulmonary Reassessment 4
- Pulmonary – Discharge
- Pulmonary – Follow-up

NOTE: The Risk Factor checkboxes on the ITP Discharge tabs always reflect the values from Q-Tel RMS. Changes to these values must be entered at Q-Tel RMS. Manual changes to those checkboxes in the worksheets will be overridden the next time Q-Progress is run.

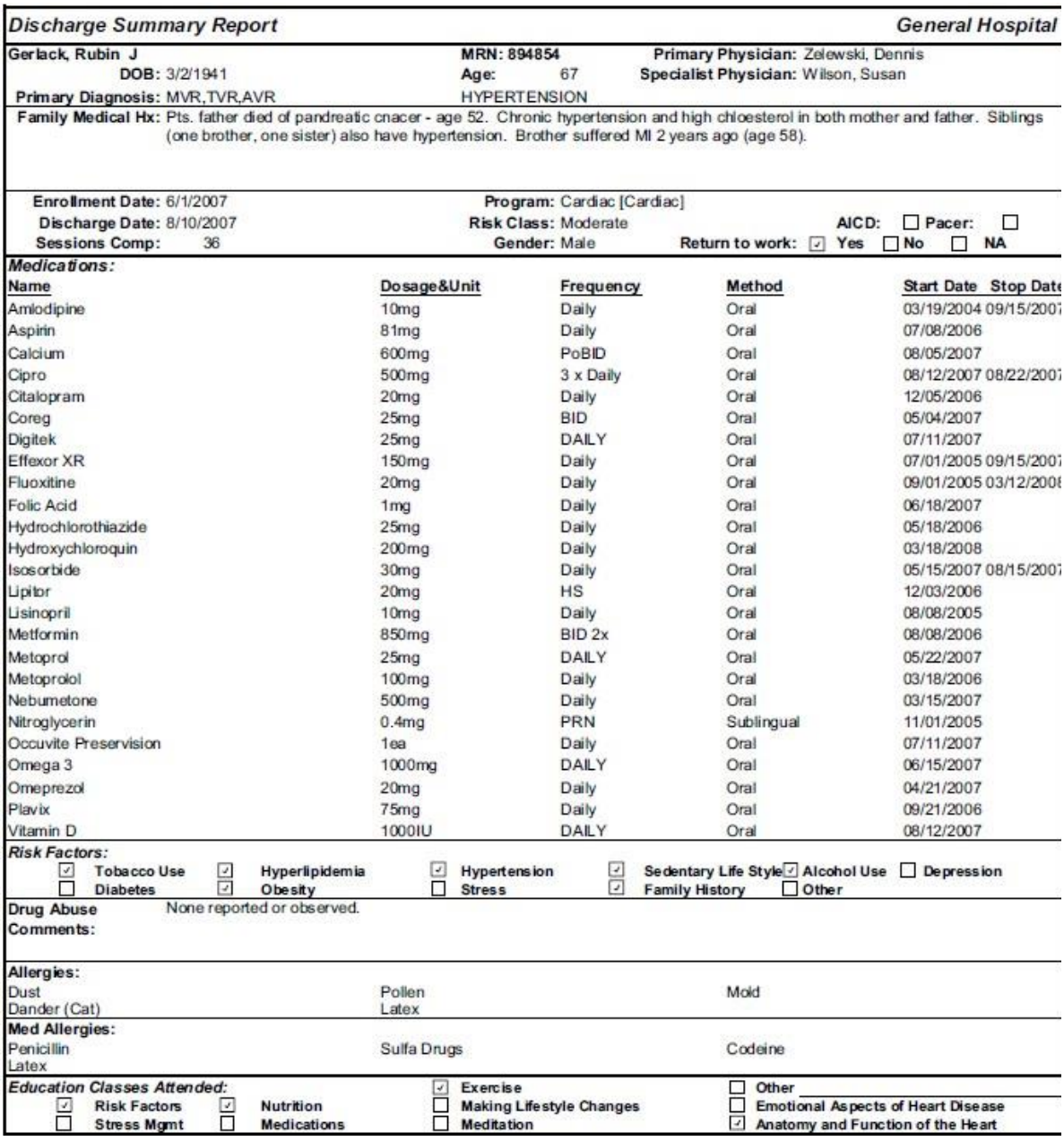
Q-Progress Discharge Summary Report (Discharge Tab)

The Q-Progress Discharge Summary Report features key patient session data including:

- Patient demographic data
- Up to 30 Medications
- Risk factors
- Drug abuse
- Allergies
- Education classes attended
- Session summary information
- Patient Goals
    - Met, not met, in progress
- Summary notes
- Discharge plan
- Case Manager signature line and date
- Customizable trend graphs with parameter selections for comparison*
    - Rest
    - Exercise
    - Rest and Exercise

*The Discharge summary must be opened in Q-Progress and not Microsoft Excel to automatically enable macros for the trend graphs.

Figure 21 Sample Discharge Summary Report (page 1)



Discharge Summary Report — ***General Hospital***

Gerlack, Rubin J — **MRN:** 894854 — **Primary Physician:** Zelewski, Dennis
DOB: 3/2/1941 — **Age:** 67 — **Specialist Physician:** Wilson, Susan
Primary Diagnosis: MVR,TVR,AVR — HYPERTENSION

Family Medical Hx: Pts. father died of pandreatic cnacer - age 52. Chronic hypertension and high chloesterol in both mother and father. Siblings (one brother, one sister) also have hypertension. Brother suffered MI 2 years ago (age 58).

Enrollment Date: 6/1/2007 — **Program:** Cardiac [Cardiac]
Discharge Date: 8/10/2007 — **Risk Class:** Moderate — **AICD:** ☐ **Pacer:** ☐
Sessions Comp: 36 — **Gender:** Male — **Return to work:** ☑ Yes ☐ No ☐ NA

Medications:

Name	Dosage&Unit	Frequency	Method	Start Date	Stop Date
Amlodipine	10mg	Daily	Oral	03/19/2004	09/15/2007
Aspirin	81mg	Daily	Oral	07/08/2006	
Calcium	600mg	PoBID	Oral	08/05/2007	
Cipro	500mg	3 x Daily	Oral	08/12/2007	08/22/2007
Citalopram	20mg	Daily	Oral	12/05/2006	
Coreg	25mg	BID	Oral	05/04/2007	
Digitek	25mg	DAILY	Oral	07/11/2007	
Effexor XR	150mg	Daily	Oral	07/01/2005	09/15/2007
Fluoxitine	20mg	Daily	Oral	09/01/2005	03/12/2008
Folic Acid	1mg	Daily	Oral	06/18/2007	
Hydrochlorothiazide	25mg	Daily	Oral	05/18/2006	
Hydroxychloroquin	200mg	Daily	Oral	03/18/2008	
Isosorbide	30mg	Daily	Oral	05/15/2007	08/15/2007
Lipitor	20mg	HS	Oral	12/03/2006	
Lisinopril	10mg	Daily	Oral	08/08/2005	
Metformin	850mg	BID 2x	Oral	08/08/2006	
Metoprol	25mg	DAILY	Oral	05/22/2007	
Metoprolol	100mg	Daily	Oral	03/18/2006	
Nebumetone	500mg	Daily	Oral	03/15/2007	
Nitroglycerin	0.4mg	PRN	Sublingual	11/01/2005	
Occuvite Preservision	1ea	Daily	Oral	07/11/2007	
Omega 3	1000mg	DAILY	Oral	06/15/2007	
Omeprezol	20mg	Daily	Oral	04/21/2007	
Plavix	75mg	Daily	Oral	09/21/2006	
Vitamin D	1000IU	DAILY	Oral	08/12/2007	

Risk Factors:
☑ Tobacco Use ☑ Hyperlipidemia ☑ Hypertension ☑ Sedentary Life Style ☑ Alcohol Use ☐ Depression
☐ Diabetes ☑ Obesity ☐ Stress ☑ Family History ☐ Other

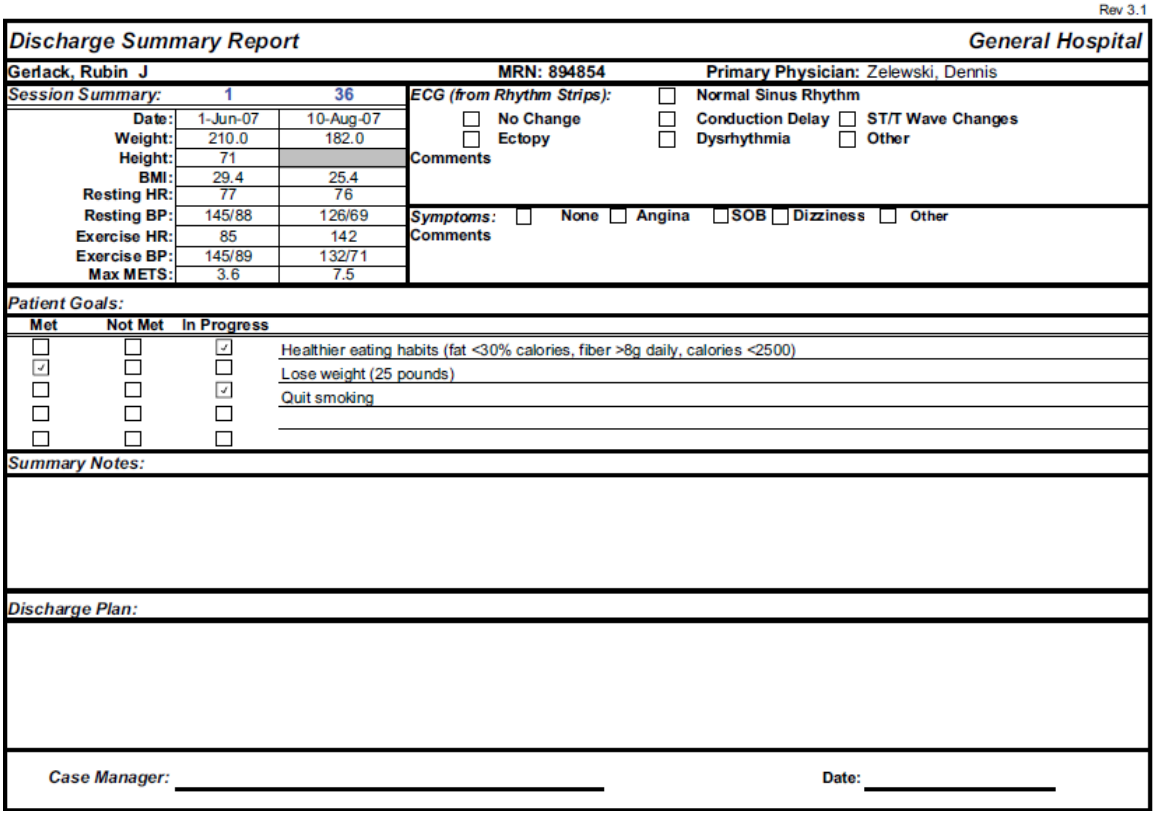
Drug Abuse None reported or observed.
Comments:

Allergies:
Dust, Dander (Cat), Pollen, Latex, Mold

Med Allergies:
Penicillin, Latex, Sulfa Drugs, Codeine

Education Classes Attended:
☑ Risk Factors ☑ Nutrition ☑ Exercise ☐ Other
☐ Stress Mgmt ☐ Medications ☐ Making Lifestyle Changes ☐ Emotional Aspects of Heart Disease
☐ Meditation ☑ Anatomy and Function of the Heart

Figure 22 Sample Discharge Summary Report (page 2)



Rev 3.1

Discharge Summary Report — **General Hospital**

Gerlack, Rubin J — MRN: 894854 — Primary Physician: Zelewski, Dennis

Session Summary:	1	36
Date:	1-Jun-07	10-Aug-07
Weight:	210.0	182.0
Height:	71	
BMI:	29.4	25.4
Resting HR:	77	76
Resting BP:	145/88	126/69
Exercise HR:	85	142
Exercise BP:	145/89	132/71
Max METS:	3.6	7.5

ECG (from Rhythm Strips): ☐ Normal Sinus Rhythm ☐ No Change ☐ Conduction Delay ☐ ST/T Wave Changes ☐ Ectopy ☐ Dysrhythmia ☐ Other

Comments

Symptoms: ☐ None ☐ Angina ☐ SOB ☐ Dizziness ☐ Other

Comments

Patient Goals:

Met	Not Met	In Progress	
☐	☐	☑	Healthier eating habits (fat <30% calories, fiber >8g daily, calories <2500)
☑	☐	☐	Lose weight (25 pounds)
☐	☐	☑	Quit smoking
☐	☐	☐	
☐	☐	☐	

Summary Notes:

Discharge Plan:

Case Manager: _____ Date: _____

Discharge Summary Report - Trending

The Discharge Summary Report features trends for key patient parameters.

Customizing the Discharge Graphs

You can customize the graphs in the discharge summary report by selecting parameters to compare with each other or across modalities. Access and print the Discharge Summary report as for all other reports.

> ***NOTE:*** *In order to see the Discharge Summary trending graphs; you must open the Discharge Summary report through Q-Progress. The trending graphs use macros. If you open the report using Excel, you must enable macros.*

These reports compare two parameters across each modality:

- **Rest** graph—compares parameters across the Rest modality
- **Exercise** graph—compares parameters across the Exercise modality. These reports compare one parameter across multiple modalities.
- **Rest and Exercise** graph—compares one parameter across the Rest and the Exercise modalities
- Configurable graph—compares one parameter across the Rest, Exercise, and Recovery modalities

To customize the reports from Q-Progress:

- Select a patient and then select the **Discharge** tab. To the right of the graph are the selection boxes for the parameters.
  - For the **Rest** graph and the **Exercise** graph, select each parameter to compare. The name of the graph changes to include the selected parameters. If the scales are different, the scale for the first parameter displays on the left of the graph and the scale for the second parameter displays to the right of the graph. The key for the parameters displays with the settings at the bottom of the graph.
  - For the **Rest and Exercise** graph and the Configurable graph, select the parameter to compare.

The name of the graph changes to include the selected parameter. The key for the modalities displays with the settings for the parameter at the bottom of the graph.

> ***NOTE:*** *If there is no data for the selected parameter, the graph does not display a marker or data for that parameter.*

Figure 23 Sample Discharge Summary Report – Trending (page 1)

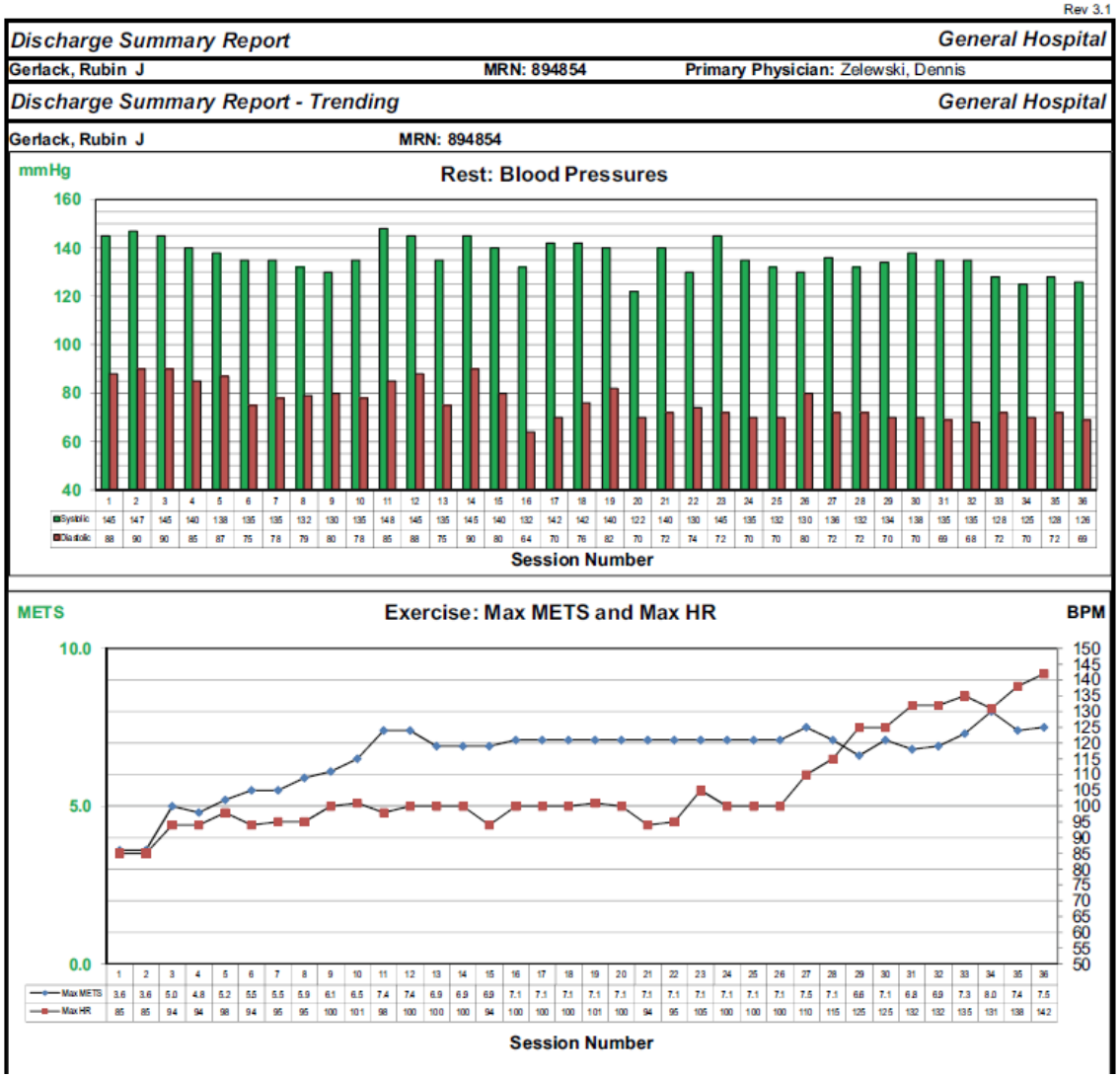


Figure 24 Sample Discharge Summary Report – Trending (page 2)

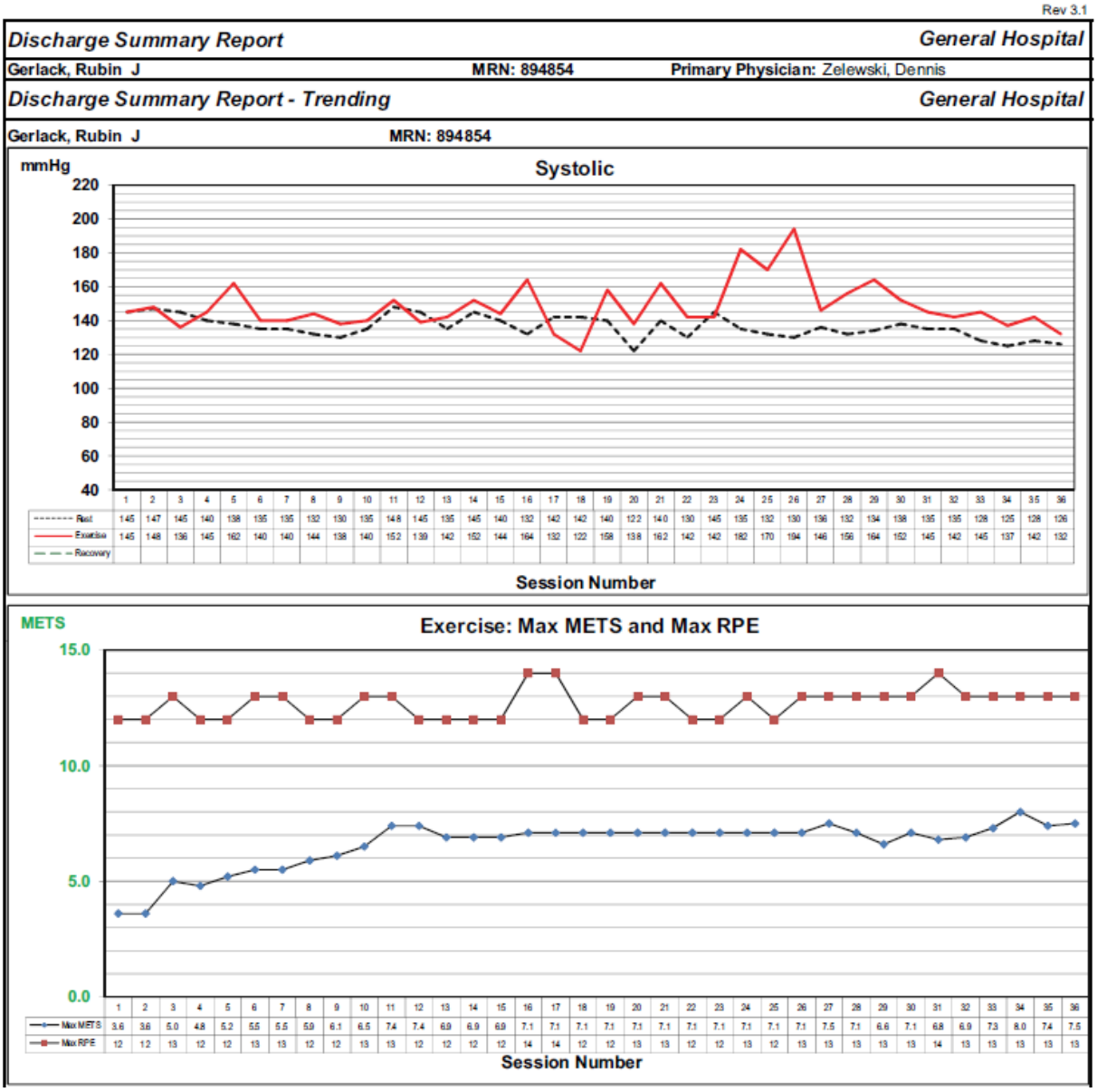
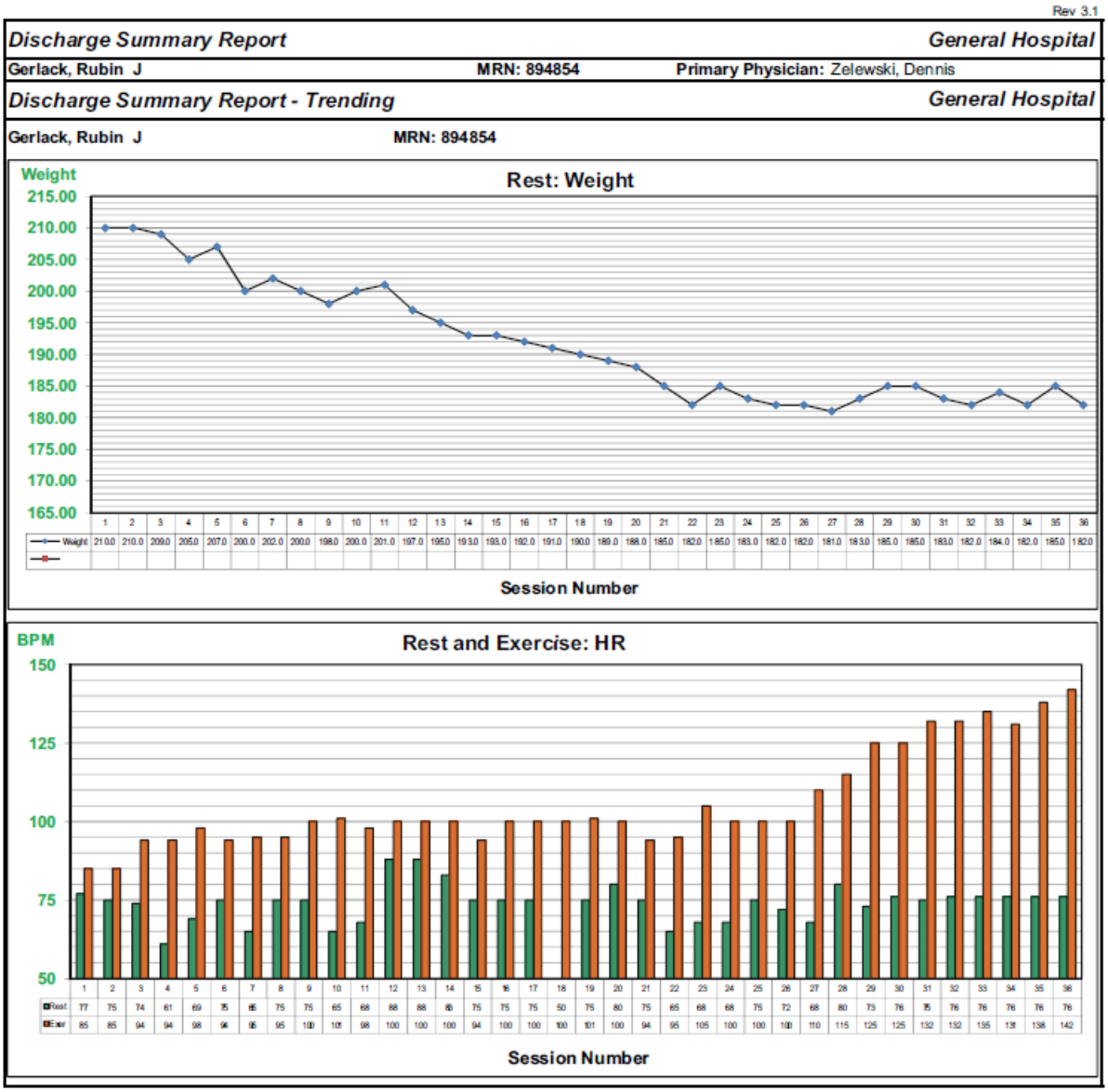


Figure 25 Sample Discharge Summary Report – Trending (page 3)



Q-Progress 36 Visit Report (36 Visit Report tab)

The Q-Progress reporting application provides the user with a comprehensive report listing completed sessions with the date and session number up to a total of 36. This report is auto populated with clinical data from the Q-Tel RMS. The clinical data that auto populates is as follows:

- The patient's Weight
- Resting Heart Rate
- Resting Blood Pressure
- Maximum Exercise Heart Rate
- Maximum Exercise Blood Pressure
- Average Exercise SpO2
- Recovery Heart Rate
- Recovery Blood Pressure

The bottom portion of the report provides Minimum, Average, and Maximum values for completed sessions, an area for comments, and a Rehab Staff signature line and date.

Q-Progress Medication Reconciliation Report (Med Rec tab)

The Q-Progress reporting application provides the user with a comprehensive report of all medications, up to a total of 30. The medication data that auto populates is as follows:

- Medication Name
- Medication Dosage and Unit
- Medication Frequency
- Method of Administration
- Medication Start Date (Reconciled Date)
- Medication Stop Date

The bottom part of the report provides an area for additional comments, a Rehab Staff signature line and date.

> ***NOTE:*** *If the Medication Reconciled (or Start) date is missing, the "Stopped" date will appear as the initial (Reconciled) date.*

Q-Progress Blood Pressure Report (BP Report)

The Q-Progress reporting application provides the user with a graphic trending report of blood pressures recorded for each session, up to a total of 36. The clinical data that auto populates is as follows:

- Resting Blood Pressure
- Maximum Exercise Blood Pressure
- Recovery Blood Pressure

The bottom portion of the report provides a Rehab Staff signature line and date.

Q-Progress Summary Outcomes Report (Summary Report tab)

The Q-Progress program automatically generates the Patient Summary Report with session data for sessions 1, 18, and 36 by default and is dependent on Q-Tel RMS headings. The first section includes the following:

- Patient demographics and program information
- Up to a total of 30 Medications with dosage, frequency, method, start date and stop date

The Report Ranges determine information in the following section of the report for Resting, Exercise and Recovery data and Quality of Life Surveys listed comparing each of 3 sessions with a percent of change.

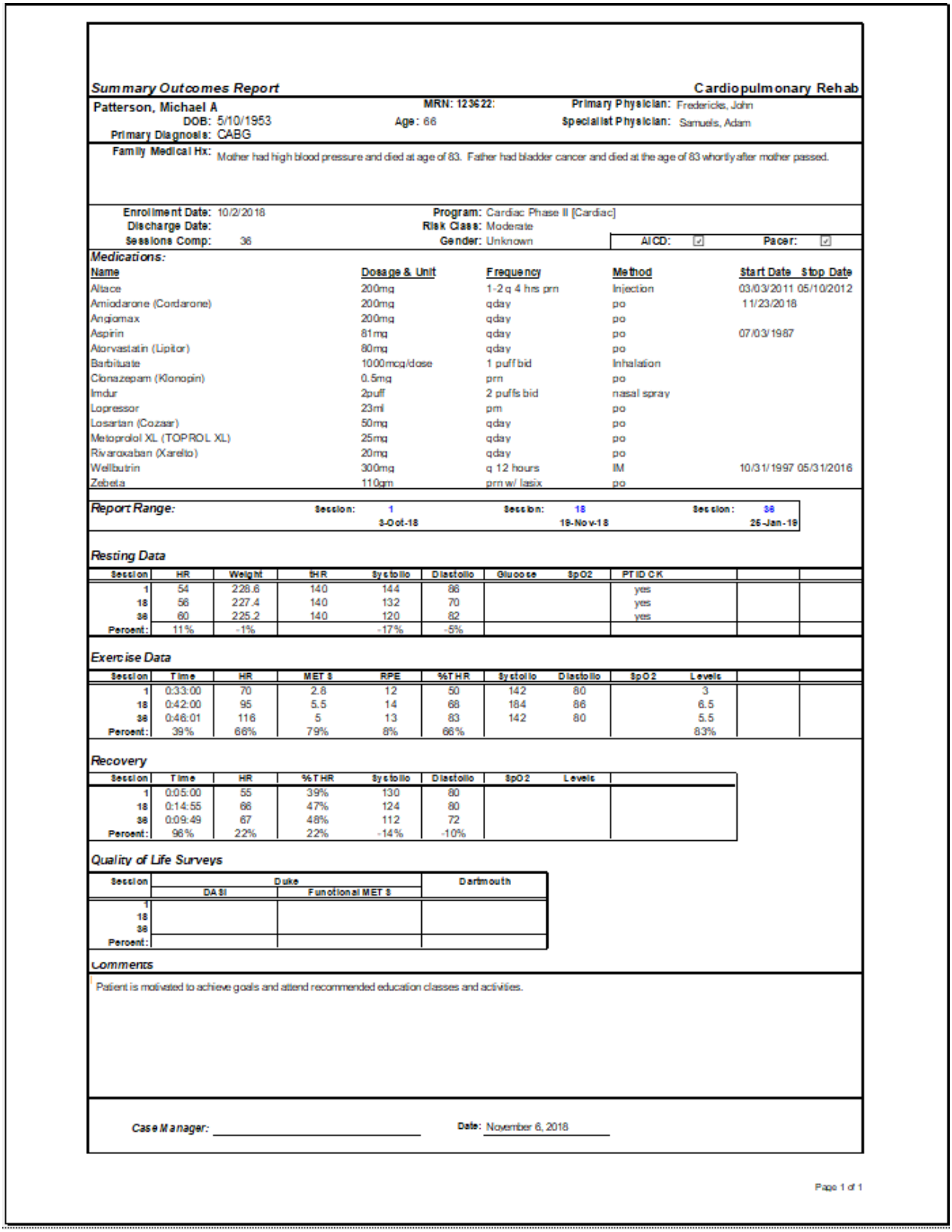
The user can change the session numbers in the cells to display different sessions for comparison.

The bottom portion of the report provides an area for comments, a Case Manager signature line and date.

> ***NOTE*:** The Quality of Life Surveys section does not automatically update to the specified sessions. However, you can manually change the session number identifiers.

The patient session data displays under the headers: Resting Data, Exercise Data, and Recovery Data. In addition, 'Open' fields correspond to the parameters defined in Q-Tel RMS and reflect the Q-Tel RMS data you entered. The report format provides for four additional parameters in Rest and three additional parameters in Exercise.

Figure 26 Example of the Summary Outcomes Report



Summary Outcomes Report

Cardiopulmonary Rehab

Patterson, Michael A MRN: 123622: Primary Physician: Fredericks, John
DOB: 5/10/1953 Age: 66 Specialist Physician: Samuels, Adam
Primary Diagnosis: CABG

Family Medical Hx: Mother had high blood pressure and died at age of 83. Father had bladder cancer and died at the age of 83 whortly after mother passed.

Enrollment Date: 10/2/2018 Program: Cardiac Phase II [Cardiac]
Discharge Date: Risk Class: Moderate
Sessions Comp: 36 Gender: Unknown AICD: ☑ Pacer: ☑

Medications:

Name	Dosage & Unit	Frequency	Method	Start Date	Stop Date
Altace	200mg	1-2 q 4 hrs prn	Injection	03/03/2011	05/10/2012
Amiodarone (Cordarone)	200mg	qday	po	11/23/2018	
Angiomax	200mg	qday	po		
Aspirin	81mg	qday	po	07/03/1987	
Atorvastatin (Lipitor)	80mg	qday	po		
Barbituate	1000mcg/dose	1 puff bid	Inhalation		
Clonazepam (Klonopin)	0.5mg	prn	po		
Imdur	2puff	2 puffs bid	nasal spray		
Lopressor	23ml	prn	po		
Losartan (Cozaar)	50mg	qday	po		
Metoprolol XL (TOPROL XL)	25mg	qday	po		
Rivaroxaban (Xarelto)	20mg	qday	po		
Wellbutrin	300mg	q 12 hours	IM	10/31/1997	05/31/2016
Zebeta	110gm	prn w/ lasix	po		

Report Range: Session: 1 (8-Oct-18) Session: 18 (18-Nov-18) Session: 36 (25-Jan-19)

Resting Data

Session	HR	Weight	SHR	Systolic	Diastolic	Glucose	SpO2	PTID CK		
1	54	228.6	140	144	86			yes		
18	56	227.4	140	132	70			yes		
36	60	225.2	140	120	82			yes		
Percent:	11%	-1%		-17%	-5%					

Exercise Data

Session	Time	HR	MET S	RPE	%THR	Systolic	Diastolic	SpO2	Levels		
1	0:33:00	70	2.8	12	50	142	80		3		
18	0:42:00	95	5.5	14	68	184	86		6.5		
36	0:46:01	116	5	13	83	142	80		5.5		
Percent:	39%	66%	79%	8%	66%				83%		

Recovery

Session	Time	HR	%THR	Systolic	Diastolic	SpO2	Levels	
1	0:05:00	55	39%	130	80			
18	0:14:55	66	47%	124	80			
36	0:09:49	67	48%	112	72			
Percent:	96%	22%	22%	-14%	-10%			

Quality of Life Surveys

Session	Duke		Dartmouth
	DASI	Functional MET S	
1			
18			
36			
Percent:			

Comments

Patient is motivated to achieve goals and attend recommended education classes and activities.

Case Manager: _____ Date: November 6, 2018

Page 1 of 1

Q-Progress Critical Comments Summary (Critical Comments tab)

The Critical Comments report reflects all the critical comments recorded in the Q-Tel RMS during the program.

The first section of the Critical Comments report displays a header containing:

- Patient demographics
- Up to 30 Medications with dosage, frequency, method, start date and stop date

Up to 10 Patient Goals

Figure 27 Example of the Critical Comments Summary

Rev 3.1

Critical Comments Summary — **General Hospital**

Gerlack, Rubin J — **Risk Class: Moderate** — **MRN: 894854**

Gender: Male	**Entry Weight:** 210.0		**Primary Physician:** Zelewski, Dennis		
DOB: 3/2/41	**Age:** 67		**Specialist Physician:** Wilson, Susan		
Enrollment Date: 6/1/07	**Height:** 71		**AICD:** ☐	**Pacer:** ☐	
Discharge Date: 8/10/07	**Program:** Cardiac [Cardiac]	**Sessions Approved:** 36	**Sessions Finished:** 36		

Medications:

Name	Dosage&Unit	Frequency	Method	Start Date	Stop Date
Amlodipine	10mg	Daily	Oral	03/19/2004	09/15/2007
Aspirin	81mg	Daily	Oral	07/08/2006	
Calcium	600mg	PoBID	Oral	08/05/2007	
Cipro	500mg	3 x Daily	Oral	08/12/2007	08/22/2007
Citalopram	20mg	Daily	Oral	12/05/2006	
Coreg	25mg	BID	Oral	05/04/2007	
Digitek	25mg	DAILY	Oral	07/11/2007	
Effexor XR	150mg	Daily	Oral	07/01/2005	09/15/2007
Fluoxitine	20mg	Daily	Oral	09/01/2005	03/12/2008
Folic Acid	1mg	Daily	Oral	06/18/2007	
Hydrochlorothiazide	25mg	Daily	Oral	05/18/2006	
Hydroxychloroquin	200mg	Daily	Oral	03/18/2008	
Isosorbide	30mg	Daily	Oral	05/15/2007	08/15/2007
Lipitor	20mg	HS	Oral	12/03/2006	
Lisinopril	10mg	Daily	Oral	08/08/2005	
Metformin	850mg	BID 2x	Oral	08/08/2006	
Metoprol	25mg	DAILY	Oral	05/22/2007	
Metoprolol	100mg	Daily	Oral	03/18/2006	
Nebumetone	500mg	Daily	Oral	03/15/2007	
Nitroglycerin	0.4mg	PRN	Sublingual	11/01/2005	
Occuvite Preservision	1ea	Daily	Oral	07/11/2007	
Omega 3	1000mg	DAILY	Oral	06/15/2007	
Omeprezol	20mg	Daily	Oral	04/21/2007	
Plavix	75mg	Daily	Oral	09/21/2006	
Vitamin D	1000IU	DAILY	Oral	08/12/2007	

Primary Diagnosis: MVR,TVR,AVR — HYPERTENSION

Family Medical Hx: Pts. father died of pandreatic cnacer - age 52. Chronic hypertension and high chloesterol in both mother and father. Siblings (one brother, one sister) also have hypertension. Brother suffered MI 2 years ago (age 58).

Patient Goals: Healthier eating habits (fat <30% calories, fiber >8g daily, calories <2500)
Lose weight (25 pounds)
Quit smoking

Comment #		
1	**Session: 1**	**Date: 6/1/07**
	SR NO NOTED ECTOPY. NO C/O ANGINA DURING SESSION.	
2	**Session: 2**	**Date: 6/3/07**
	SR NO NOTED ECTOPY. NO C/O ANGINA DURING SESSION.	
3	**Session: 3**	**Date: 6/5/07**
	SR W INFERIOR T WAVE INVERSION. NO NOTED ECTOPY. NO C/O ANGINA DURING SESSION.	
4	**Session: 4**	**Date: 6/7/07**
	SR W INFERIOR T WAVE INVERSION. NO NOTED ECTOPY. NO C/O ANGINA DURING SESSION.	
5	**Session: 5**	**Date: 6/9/07**
	SR W INFERIOR T WAVE INVERSION. NO NOTED ECTOPY. NO C/O ANGINA DURING SESSION.	
6	**Session: 6**	**Date: 6/11/07**
	SR W INFERIOR T WAVE INVERSION. NO NOTED ECTOPY. NO C/O ANGINA DURING SESSION.	

Q-Progress Patient Session Summary (Session Data tab)

The Patient Session Summary features data for all available sessions, up to 36. The top section of the report includes:

- Patient demographics
- Up to 30 medications (as listed in the user interface)
- Up to 10 patient goals (as listed in the user interface)

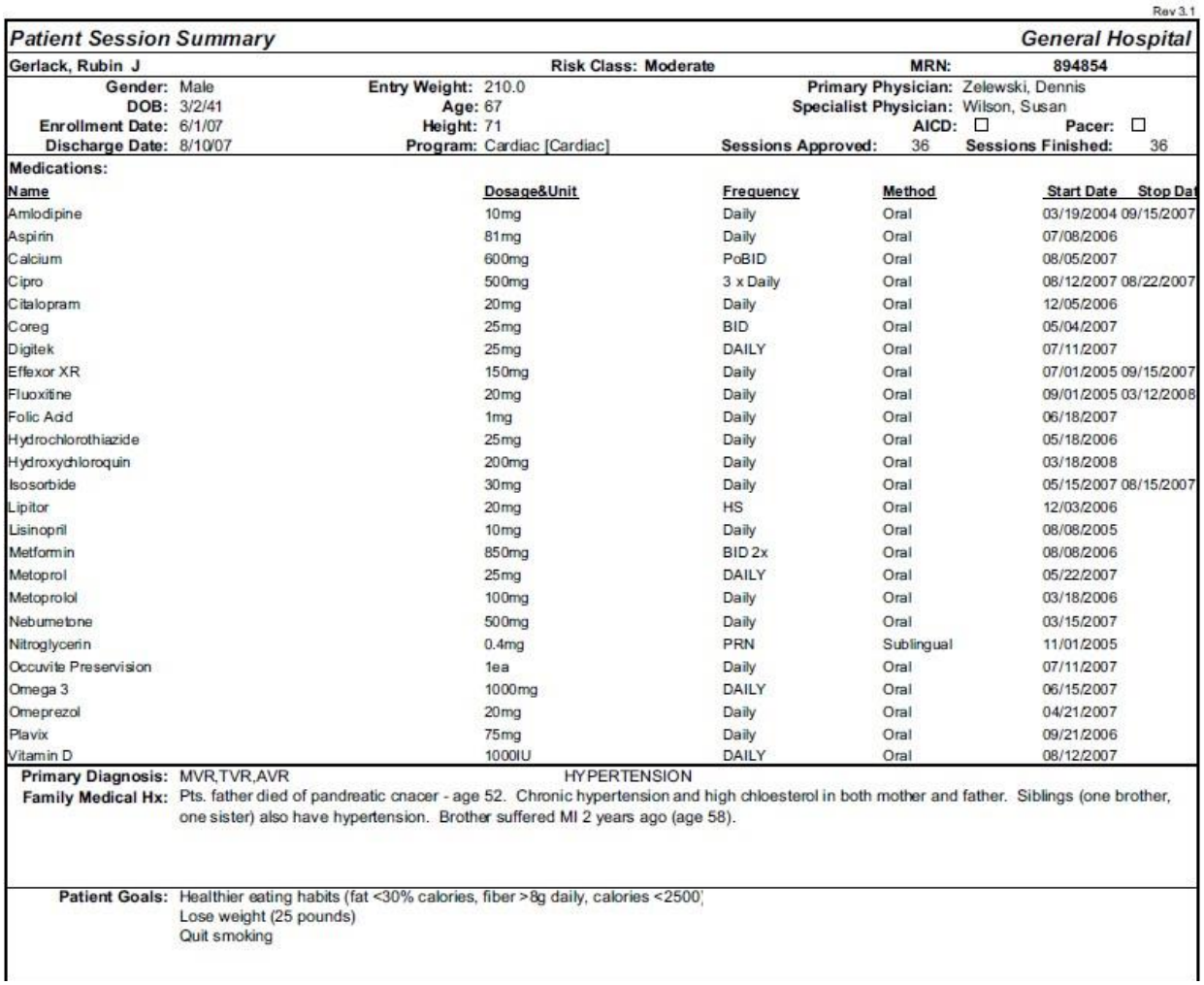
The subsequent sections include an abbreviated header with session number and date to include resting information, exercise information, recovery information, patient comments and clinical comments. A maximum of the first ten exercise modalities are included in this report.

The Patient Session Summary report does not include the following:

- Text data entered in the Rest workload field in Q-Tel RMS
- An RPE value entered for Recovery in Q-Tel RMS

Note: The user can edit data from Q-Tel RMS in this page. Changes will not be reflected in the Q-Tel RMS database and it is strongly recommended to use Q-Tel RMS Charting and Editing for any needed change to ensure data integrity.

Figure 28 Example of the Patient Session Summary (page 1)



Rev 3.1

Patient Session Summary ***General Hospital***

Gerlack, Rubin J **Risk Class: Moderate** **MRN: 894854**

Gender:	Male	**Entry Weight:**	210.0	**Primary Physician:**	Zelewski, Dennis
DOB:	3/2/41	**Age:**	67	**Specialist Physician:**	Wilson, Susan
Enrollment Date:	6/1/07	**Height:**	71	**AICD:** ☐	**Pacer:** ☐
Discharge Date:	8/10/07	**Program:**	Cardiac [Cardiac]	**Sessions Approved:** 36	**Sessions Finished:** 36

Medications:

Name	Dosage&Unit	Frequency	Method	Start Date	Stop Dat
Amlodipine	10mg	Daily	Oral	03/19/2004	09/15/2007
Aspirin	81mg	Daily	Oral	07/08/2006	
Calcium	600mg	PoBID	Oral	08/05/2007	
Cipro	500mg	3 x Daily	Oral	08/12/2007	08/22/2007
Citalopram	20mg	Daily	Oral	12/05/2006	
Coreg	25mg	BID	Oral	05/04/2007	
Digitek	25mg	DAILY	Oral	07/11/2007	
Effexor XR	150mg	Daily	Oral	07/01/2005	09/15/2007
Fluoxitine	20mg	Daily	Oral	09/01/2005	03/12/2008
Folic Acid	1mg	Daily	Oral	06/18/2007	
Hydrochlorothiazide	25mg	Daily	Oral	05/18/2006	
Hydroxychloroquin	200mg	Daily	Oral	03/18/2008	
Isosorbide	30mg	Daily	Oral	05/15/2007	08/15/2007
Lipitor	20mg	HS	Oral	12/03/2006	
Lisinopril	10mg	Daily	Oral	08/08/2005	
Metformin	850mg	BID 2x	Oral	08/08/2006	
Metoprol	25mg	DAILY	Oral	05/22/2007	
Metoprolol	100mg	Daily	Oral	03/18/2006	
Nebumetone	500mg	Daily	Oral	03/15/2007	
Nitroglycerin	0.4mg	PRN	Sublingual	11/01/2005	
Occuvite Preservision	1ea	Daily	Oral	07/11/2007	
Omega 3	1000mg	DAILY	Oral	06/15/2007	
Omeprezol	20mg	Daily	Oral	04/21/2007	
Plavix	75mg	Daily	Oral	09/21/2006	
Vitamin D	1000IU	DAILY	Oral	08/12/2007	

Primary Diagnosis: MVR,TVR,AVR HYPERTENSION

Family Medical Hx: Pts. father died of pandreatic cnacer - age 52. Chronic hypertension and high chloesterol in both mother and father. Siblings (one brother, one sister) also have hypertension. Brother suffered MI 2 years ago (age 58).

Patient Goals: Healthier eating habits (fat <30% calories, fiber >8g daily, calories <2500)
Lose weight (25 pounds)
Quit smoking

Figure 29 Example of the Patient Session Summary (page 2)

Rev 3.1

Patient Session Summary — General Hospital

Gerlack, Rubin J		Risk Class: Moderate		MRN:	894854
Gender:	Male	Entry Weight:	210.0	Primary Physician:	Zelewski, Dennis
DOB:	3/2/41	Age:	67	Specialist Physician:	Wilson, Susan
Enrollment Date:	6/1/07	Height:	71	AICD: ☐	Pacer: ☐
Discharge Date:	8/10/07	Program:	Cardiac [Cardiac]	Sessions Approved: 36	Sessions Finished: 36

Session: 1 — Date: 6/1/2007

Resting Data: Monitored

HR	Weight	tHR	Systolic	Diastolic	Glucose	SpO2				
77	210		145	88		95				

Patient Comment: PATIENT VERBALIZES AN UNDERSTANDING OF HOME EXERCISE AND THE EXPECTATION OF REGULAR EXERCISE OUTSIDE OF CLASS.

Exercise Data:

Activity	Time	Workload	HR	METS	RPE	% THR	Systolic	Diastolic	SpO2			
Warmup	5:00		75									
Treadmill	18:00	peed 3.0,Grade 0.0,	85	3.3	12		145	89				
REC BIKE 7	15:00	LEVEL 4	85	3.6	12				92			
Recovery	20:00		80				150	92				

Comment: CONSENTS SIGNED, CLASS SEQUENCE AND SCHEDULE EXPLAINED. PATIENT VERBALIZES AN UNDERSTANDING OF THE RISKS AND BENEFITS OF OUT PATIENT CARDIAC REHAB.

Session: 2 — Date: 6/3/2007

Resting Data: Monitored

HR	Weight	tHR	Systolic	Diastolic	Glucose	SpO2				
75	210		147	90		98				

Patient Comment: 20 MIN WALK AT HOME

Exercise Data:

Activity	Time	Workload	HR	METS	RPE	% THR	Systolic	Diastolic	SpO2			
Warmup	5:00		75									
Treadmill	20:00	peed 3.0,Grade 0.0,	85	3.3	12		148	91				
REC BIKE 7	20:52	LEVEL 4	85	3.6	12				96			
Recovery	20:27		100				150	93				

Comment: WILL BRING IN DHS AND MEDS NEXT CLASS--CHEST AND LEFT LEG INCISIONS HEALING WELL WITH GOOD O2 SATS–LUNG FIELDS CLEAR

Duke Activity Status Index (Duke Index tab)

Use the Duke Activity Status Index (DASI) to track activity. Q-Progress automatically scores the test and displays the results on the Summary Report. This report includes the patient name and Medical Record Number (MRN) with results for session numbers 1, 18, and 36.

The Duke score and Functional Capacity in METS are calculated at the bottom of the page.

Figure 30 Example of the Duke Activity Status Index

Gerlack, Rubin J **MRN: 894854**

Duke Activity Status Index

	Can you ... (Check ☑ each box to indicate YES)	Session Number 1	18	36
1	Take care of yourself, that is, eating, dressing or using the toilet?	☑	☑	☑
2	Walk indoors, such as around your house?	☐	☑	☑
3	Walk a block or 2 on level ground?	☑	☑	☑
4	Climb a flight of stairs or walk up a hill?	☐	☐	☐
5	Run a short distance?	☑	☑	☑
6	Do light work around the house like dusting or washing the dishes?	☐	☑	☑
7	Do moderate work around the house like vacuuming, sweeping floors, or carrying in groceries?	☑	☑	☑
8	Do heavy work around the house like scrubbing floors, or lifting or moving heavy furniture?	☐	☑	☑
9	Do yardwork like raking leaves, weeding, or pushing the lawn mower?	☑	☑	☑
10	Have sexual relations?	☑	☑	☑
11	Participate in moderate recreational activities like golf, bowling, dancing, doubles tennis, or throwing a baseball or football?	☐	☐	☑
12	Participate in strenuous sports like swimming, singles tennis, football, basketball or skiing?	☐	☐	☐
	Score:	26.8	39.2	45.2
	Functional Capacity in METS:	6.03	7.56	8.3

Dartmouth Quality of Life Index (Dartmouth Index tab)

The Dartmouth Quality of Life Index provides functionality similar to the Duke Index sheet.

Feelings

During the past 4 weeks how much have you been bothered by emotional problems such as feeling anxious, depressed, irritable or downhearted and blue?

Feelings	Session Number		
	1	18	36
Not at all	○	○	○
Slightly	○	○	○
Moderately	○	○	○
Quite a bit	○	○	○
Extremely	◉	○	○

Physical Fitness

During the past 4 weeks what was the hardest physical activity you could do for at least 2 minutes?

Physical Fitness	Session Number		
	1	18	36
Very Heavy Run Fast; Carry Heavy Loads Uphill	○	○	○
Heavy Jog; Climb Stairs or Hill	○	○	○
Moderate Walk Medium; Carry Light Loads	○	○	○
Light Walk Medium; Carry Light Loads	◉	○	○
Very Light Walk Slow; Wash Dishes	○	○	○

Social Support

During the past 4 weeks was someone available to help you if you needed and wanted help? For example, if you:

- Felt very nervous, lonely, or blue
- Got sick and had to stay in bed
- Needed someone to talk to
- Needed help with daily chores
- Needed help just taking care of yourself

Social Support	Session Number		
	1	18	36
Yes, as much as I wanted	○	○	○
Yes quite a bit	○	○	○
Yes, some	●	○	○
Yes, a little	○	○	○
No, not at all	○	○	○

Daily Activities

During the past 4 weeks how much difficulty have you had doing your usual activities or tasks, both inside and outside the house because of your physical and emotional health?

Daily Activities	Session Number		
	1	18	36
No difficulty at all	○	○	○
A little bit of difficulty	○	○	○
Some difficulty	●	○	○
Much difficulty	○	○	○
Could not do	○	○	○

Social Activities

During the past 4 weeks has your physical and emotional health limited your social activities with family, friends, neighbors or groups?

Social Activities	Session Number		
	1	18	36
Not at all	○	○	○
Slightly	○	○	○
Moderately	●	○	○
Quite a bit	○	○	○
Extremely	○	○	○

Pain

During the past 4 weeks how much bodily pain have you generally had?

Pain	Session Number		
	1	18	36
No pain	○	○	○
Very mild pain	●	○	○
Mild pain	○	○	○
Moderate pain	○	○	○
Severe pain	○	○	○

Overall Health

During the past 4 weeks how would you rate your health in general?

Overall Health	Session Number		
	1	18	36
Excellent	○	○	○
Very good	○	○	○
Good	○	○	○
Fair	●	○	○
Poor	○	○	○

Quality of Life

How have things been going for you during the past 4 weeks?

Overall Health	Session Number		
	1	18	36
Very well - Could hardly be better	○	○	○
Pretty good	●	○	○
Good & bad parts about equal	○	○	○
Pretty bad	○	○	○
Very bad - Could hardly be worse	○	○	○

Change in Health

How would you rate your overall health now compared to 4 weeks ago?

Change in Health	Session Number		
	1	18	36
Much better	○	○	○
A little better	○	○	○
About the same	●	○	○
A little worse	○	○	○
Much worse	○	○	○

Summary

The summary for the index.

Summary	Session Number		
	1	18	36
Score:	29	0	0

Q-Progress Weekly Summary Report

The Weekly Summary Report is formatted the same as the Summary Report described in the previous section. It provides a mechanism for specifying a range of sessions to report on and automatically prints those reports for the selected patients on a single page. The reports for patients who have no data within the specified session ranges will have blank spaces in the report for those sessions.

The Weekly Summary Report is valid only for patients with 36 sessions or less. To generate the weekly summary report:

1. Check the boxes corresponding to patients you want to include in the report.
2. Select the **Weekly Summary Report** menu or toolbar option.

The system displays a dialog box that allows you to select the sessions and the patients you want to include in the report.

Field	Description
Specify Sessions	• **Default** - Prints the three most recent sessions for selected patients. For example, if a patient has completed 7 sessions, this option generates the Patient Summary Report with sessions 5, 6, and 7 as the displayed defaults. Use this option to print Weekly Summary Reports for selected patients. • **Custom** - Specify the three sessions you would like to report on. You must provide a Beginning, Middle, and Ending session. For example, you may choose to view a range of sessions such as Sessions 10, 15, and 20. Patients who have not completed the selected sessions are not printed.
Select Patients	To select Patients for a Weekly Summary Report, choose a method: • Click on the box next to the patient to display a checkmark. • Press the **TAB** key to navigate to the Patient list, use the **UP** and **DOWN** arrow keys to select a patient and then press the **SPACEBAR** to display or remove the checkmark.

AACVPR Registry Worksheets

The Q-Progress AACVPR Registry worksheets gather some information from the Q-Tel RMS application and allow manual entry of all fields tracked via the AACVPR Cardiac and Pulmonary Outcomes Registry. The data collected on this worksheet can be sent directly to the AACVPR Registry from both the AACVPR Discharge and the AACVPR Follow-up worksheets.

To enable (display) the worksheets you will need:

1. Your AACVPR Registry ID & password. These credentials are provided by AACVPR.
2. Your authentication code. This can be obtained by contacting Welch Allyn Technical Support and providing them with the last 6 digits of your registry ID.

Population of data via Q-Tel RMS:

Some of the data in the AACVPR Registry worksheets is populated from Q-Tel RMS via Q-Progress and some fields can be populated using data from Q-Exchange (optional). Please see the list at the end of this section for fields that are automatically populated. For data to be populated from Q-Exchange, the appropriate fields must be completed in Q-Tel RMS and the Q-Exchange data that includes patient demographics and session data needs to be exported. Please consult the Q-Tel RMS Q-Exchange section in this manual for details.

Using the AACVPR Registry Worksheets

The AACVPR Registry worksheets consist of the following:

AACVPR Program Intake: Use this sheet to fill in the fields that describe the patient when they started their rehabilitation. Some of the data will be populated from data in the Q-Tel RMS program. If this data is incorrect, it is best to update the appropriate fields in Q-Tel RMS so the worksheets will be consistent with Q-Tel RMS.

Some data, such as patient name and MRN can only be entered/edited on the Intake sheet. The same applies to units of measurement for anthropometric data, lipids/glucose and functional assessments. Please make sure the data you are entering corresponds with the units shown.

AACVPR Program Discharge: Use this sheet to fill in the fields that describe the patient upon discharge from the program. Similar to the intake worksheet, some of the data will be populated from data in Q-Tel RMS.

AACVPR Program Follow-up: Use this sheet to fill in the fields that indicate the patient's condition during a follow-up visit. The data on this page is not populated with data because Q-Tel RMS does not track follow-up visits.

The AACVPR Discharge and AACVPR Follow-up worksheets include a button to send the data directly to the registry. For this action to be successful, the computer needs to be connected to the Internet, and the AACVPR credentials must be correct. Update your AACVPR credentials on the "Cover" worksheet.

Information should only be transmitted to the Registry at Discharge, and then again at Follow-Up. Any transmission to the registry includes all information contained in the AACVPR tabs. (So if you don't send it at Discharge, you can complete all three tabs at Follow-Up, and then send the data once.) After you press the "Send" button, progress and the success of the transmission are displayed.

> ***NOTE**: Demographic data on the AACVPR Discharge and AACVPR Follow-up worksheets for the patient will reflect the data on the AACVPR Intake worksheet and can only be updated on the AACVPR Intake worksheet.*

List of Auto-Populated AACVPR Fields

The following tables list fields that automatically populate from Q-Progress or Q-Exchange.

AACVPR Programs Intake

Demographics	
Patient Last Name	Q-Progress
DOB	Q-Progress
Gender	Q-Progress
Zip Code	Q-Exchange
Primary Physician	Q-Progress
MRN	Q-Progress
Race	Q-Exchange
Specialist Physician	Q-Progress
Primary Insurance	Q-Exchange
Secondary Insurance	Q-Exchange
Medical History	
Hyperlipidemia	Q-Progress
Hypertension	Q-Progress
Diabetes	Q-Progress
Program Intake	
Enrollment Date	Q-Progress
Prescribed Sessions	Q-Progress
AACVPR Risk Category	Q-Progress
Clinical Outcomes	
Lipids Date	Q-Exchange
Total	Q-Exchange
TG	Q-Exchange
HDL	Q-Exchange
LDL	Q-Exchange
FBG	Q-Exchange
A1C	Q-Exchange
Systolic	Q-Progress
Diastolic	Q-Progress
Weight	Q-Progress
Height	Q-Progress
Tobacco Use Status	
Use	Q-Exchange
Quit Date	Q-Exchange
Average Packs Per Day	Q-Exchange
Years	Q-Exchange
Physical Activity	
Exercise Minutes/Day	Q-Exchange
Exercise Days/Week	Q-Exchange

Demographic data on the AACVPR Discharge and AACVPR Follow-up worksheets for the patient will reflect the data on the AACVPR Intake worksheet and can only be updated on the AACVPR Intake worksheet.

AACVPR Programs Discharge

Demographics	
Specialist Physician	Intake
Program Discharge	
Sessions Completed	Q-Progress
ECG Monitored Sessions	Q-Progress
Clinical Outcomes	
Lipids Date	Q-Exchange
Total	Q-Exchange
TG	Q-Exchange
HDL	Q-Exchange
LDL	Q-Exchange
Systolic	Q-Progress
Diastolic	Q-Progress
Weight	Q-Progress
Height	Intake

Hospital Readmission data is carried from the AACVPR Discharge worksheet to the AACVPR Follow-up worksheet.

AACVPR Programs Follow-up

Demographics	
Specialist Physician	Intake
Hospital Readmission	
Type, Date, and Days	Discharge

Printing Q-Progress Worksheets

Each individual worksheet can be printed using standard Microsoft Excel print functions. Excel includes a "print preview" feature to help you gage how the printed worksheets appear when printed. Please be sure to install the appropriate print drivers and print a few initial reports to ensure that the reports print as intended.

Prior to printing, we recommend saving the worksheet. Only one worksheet should be printed at a time.

Troubleshooting

This section describes resolutions to common issues.

Problems	Possible Solution/Explanation
A "Compatibility Checker" popup is seen when opening the Q-Progress worksheets.	Depending on the version of Excel used, some compatibility notices may appear when saving the template or patient report. Provided you continue using the same (or a newer) version of Excel, you can disable Compatibility Checker.
User is prompted with, "Do you want to replace the contents of the destination cells?" message.	While updating a report from the Q-Progress utility, this message may appear. Answer **Yes** to ensure the latest patient information is included in the Excel report.
Error message received when attempting to send data to the registry.	Check that internet connection is available and AACVPR Registry credentials are correct.
Data in worksheet is not being updated with current Q-Tel RMS information.	Check that the cell where the data is expected to be updated contains a formula and that the formula was not overwritten.
Risk Factors checkboxes overwrite user selections when re-opened in the Q-Progress worksheet.	The Risk Factors checkboxes will always update to reflect the data in the Q-Tel RMS application. Make changes to these values in Q-Tel RMS.

Q-Progress and Microsoft Excel

Q-Progress uses Microsoft Excel for report generation. All report formats and computations are controlled using a single Excel template file that consolidates all of the reports into one workbook. This section provides tips and suggestions on how to get the most out of the capabilities of Q-Progress and Excel.

Q-Progress integration with Excel

When Q-Progress generates the reports for a patient, it first looks to see if it has previously created the Excel file for the patient. If so, it opens the existing Excel file and updates the Patient.csv tab of the workbook with the current Q-Tel RMS data for all sessions.

Any session data edits you make in Q-Tel RMS Charting and Editing are reflected in the updated data exported into the Excel workbook for the patient. It is strongly recommended that edits to session data occur in Q-Tel RMS and not in the Excel Session Report.

If Q-Progress doesn't find the Excel file for the patient in the Storage Directory (see *Configuring the Storage Directory*) it uses the template file to create an Excel file for this patient and loads the Q-Tel RMS data into the Patient.csv tab of the workbook. This ensures that the data not otherwise managed by Q-Tel RMS (for example, information you enter onto the CMS forms, educational classes attended, any customized data fields added by your organization, etc.) is saved and available on subsequent access to the reports.

Patient reports are saved as Excel files that are named using the patient's MRN followed by a random number.

Saving Your Work

If you are using the Excel report workbooks only for viewing and printing reports then you can simply exit Excel, or close the workbook, when finished with the patient's data.

Caution: Possible data loss.

If you are making entries and changes in the workbook, click **Save** before you close the report or the changes are lost.

Excel Display Notes

This section describes features of Excel that affect Q-Progress.

If the network connection fails, an export failure occurs and a network error message appears.

Display Area

A display cell within an Excel spreadsheet has a dedicated and finite amount of space for displaying the contents of the cell. Although this ensures that a report remains properly formatted, data elements that are longer than expected will be truncated. For numbers that are larger than the allocated display space a display error is indicated by ####. Text fields (for example, a patient last name longer than 13 characters) are truncated to the characters that fit within the allocated space. Depending upon the formatting of the text cell (left, center or right justified), either or both ends of the long text field may be truncated. The field sizes set in the template have been used with numerous patients and provide a good balance between format and length needs.

Patient Goals

The Session Data, Discharge, and Critical Comments reports allocate a limited number of text lines for patient goals. Q-Tel RMS allows for an unlimited number of goals and organizes the goals according to the order they were entered in Q-Tel RMS.

Session Activities

The Session Data Report displays up to ten exercise modalities and the Recovery activity for each session. If there are more than ten exercise modalities for a session, only the first ten modalities are presented in the report.

Workbook Tabs

Each report is located on a dedicated tab displayed at the bottom of the Excel screen.

The tabs may be scrolled off the screen. If so, use the arrow keys at the left to scroll the tabs left and right. The left and right most icons scroll the tabs to the extreme left and right respectively. The center icons scroll the tabs one tab at a time.

BACKUP/RESTORE UTILITY

The Q-Tel RMS system includes a Backup/Restore utility. Use the Backup/Restore utility to back up your system and restore the patient rehab data in the event of a catastrophic hardware failure (for example, a hard disk crash). Q-Tel RMS data included in the backup is stored in three areas:

Data	Source
Patient demographic and session data	Microsoft SQL database
Full Disclosure ECG data and ECG strips	Direct access binary files
Q-Progress patient reports	Individual Microsoft Excel workbooks

The backup does not include PDF reports generated by Q-Tel RMS.

The Backup/Restore utility copies data from all three sources to your selected backup media; network drive or external hard drive for backup storage. **Note:** The Backup/Restore utility saves the rehab data located on the Q-Tel RMS computer ONLY. If you have set up the Q-Progress directory for storage of the Excel workbooks (see *Configuring the Storage Directory*) to a folder other than the default (C:\Program Files\Quinton\QTel RMS\QProgressCSVData) on the Q-Tel RMS system, then these files are not saved with the backup. You should ensure that your system administrator is properly backing up these files, along with any other data critical to your operation on a regular basis.

Backup media should be stored in a secure location physically separate from the Q-Tel RMS system to mitigate loss due to fire or flood. Ensure environmental conditions specified for the backup media are maintained. If backing up to a network drive, ensure appropriate safeguards are in place.

Backup

This section describes how to back up data on the Q-Tel RMS system.

Backup Frequency

The frequency of your system backups should be based on the effort required to do the backups versus the effort to recover from the loss of data. Whether you back up to external hard drive or to a network drive, it is recommended that you perform a backup of your Q-Tel RMS system daily. The backup process can run unattended.

1. Perform the backup process described in the next section.
2. Leave for the day.
3. The next morning close the Backup/Restore utility.

Backing up Q-Tel RMS

You cannot use the Q-Tel RMS system while a backup is in process.

The backup can take several hours depending on how much rehab data is on your system. It is best to begin the backup before leaving for the day.

> ***NOTE:*** *You must be logged into the system using an account with administrator privileges in order to run the Backup/Restore Utility.*

To back up the Q-Tel RMS system:

1. Close all applications.
2. Double-click on the **Q-Tel Backup Restore** icon on the Q-Tel RMS system desktop. The system displays the **Backup/Restore Utility** screen.
3. Select the backup location in the **Data Destination** section. If you are backing up to tape, insert a tape.
4. Click on Start Backup.
   - If you selected **Hard Drive** as your data destination, the system displays the **Select Backup Folder** screen.
   - To back up to a networked drive, your Q-Tel RMS computer must be mapped to that drive:
     a. Click the down arrow on the **Select Backup** Folder.
     b. Select the drive for the backup files.
     c. Select a folder and the path for the backup files.
     d. Click **OK**.
5. The Backup/Restore utility checks to make sure there is enough space for the backup.

Caution: Possible improper system performance.

Backup does not overwrite the previous backup. Periodically you must delete old backups in order to ensure there is room on the drive for new backups.

The directories are listed in the **Backup** tab as they are backed up. When the backup is complete, the system displays a message indicating that the backup was successful.

6. Click **OK**.
7. Close the Backup/Restore utility.

Restore

The Restore function writes all the data from the backup media to the Q-Tel RMS system, completely restoring the Q-Tel RMS SQL database, the associated ECG files, and any Q-Progress files stored in the C:\ProgramFiles\Quinton\QTel RMS\QProgressCSVDatafolder.

You cannot use the Q-Tel RMS system while Restore is active.

The Restore process can take several hours depending on how much rehab data was backed up.

Caution: Possible data loss.

Restoring an old backup file will overwrite any existing data, including the Q-Tel RMS database, ECG files, and Q-Progress files. Do not perform a restore if you require any of the data on the system hard drive.

To restore data from a backup:

1. Close all applications.
2. Double-click on the **Backup Restore** icon on the Q-Tel RMS system desktop. You must have administrative privileges to run the Restore function.
3. Click the **Restore** tab.
4. Verify the correct backup media is selected.
5. Click **Start Restore**. The system displays a message warning that all rehab data on the Q-Tel RMS system will be overwritten with the contents of the backup.
6. Select **Yes** to proceed with the Restore or select **No** to cancel the Restore.
7. For a restore from the hard drive, select the location of the backup you want to use for the restore process; click on the backup name, then click **OK**. The system restores the selected backup. When the restore is complete, the system displays a message indicating that the Restore was successful.
8. Click **OK**.
9. Close the Backup/Restore utility.

Messages

The Backup/Restore utility detects the following conditions and displays a dialog box:

Error Condition	Description
Incompatible data	The backup media and the Q-Tel RMS system contain different software versions.
Missing data	The backup files are not in the specified folder.

ALARM SUBSYSTEM

Q-Tel RMS includes several tools to help the clinical user rapidly identify medical or technical problems that can impact the health or safety of the rehab patients. Medical alarms include both common and life-threatening conditions, such as premature ventricular contractions (PVCs) or ventricular fibrillation. The technical alarms include common issues, such as lead-off conditions and low battery, as well as other important warnings such as when a patient is nearing the four-hour limit for full disclosure storage.

The clinical user can control which alarms are presented through visual and audio signals, and if the alarms remain presented even if the underlying alarm condition has terminated. This chapter highlights each of these areas and concludes with some example cases that illustrate the behaviors.

For more information on alarms and their causes, refer to *Physician's Guide to Signal Analysis*.

Alarm Types

The Q-Tel RMS alarm configurations are:

- Basic medical alarms (Standard)—asystole, ventricular fibrillation, ventricular tachycardia, high heart rate and low heart rate - and technical alarms.
- The Advanced Arrhythmia option—the five basic medical alarms, the technical alarms, and the medical alarms: bigeminy, couplet, high PVC, missing QRS, trigeminy, ventricular multifocal PVCs, ventricular rhythm, and ventricular run.

WARNING! Audible alarm.

Q-Tel RMS detects and displays only those alarms enabled for your system configuration.

WARNING! The *Lead Off* condition disrupts the alarm function.

The arrhythmia alarm detection system must have all leads properly connected to the patient in order to function correctly. If a lead-off condition occurs and the Lead Off alarm displays, reattach the lead as soon as possible.

WARNING! Selectable Alarm Presets.

Using different alarm presets for the same or similar equipment on a patient could result in a potential hazard. Ensure that the alarm presets are appropriate for the patient before monitoring.

Following tables describe the medical and technical alarms and factory default settings.

Medical Alarms

Basic/Advanced Alarm Type	Medical Alarms	Description	Default Priority	Default Persistence
Basic and Advanced	Asystole	Absence of a QRS complex for four or more seconds.	High	Visual
Basic and Advanced	Ventricular Fibrillation	Irregular ECG signal with no recognizable QRS complex.	High	Visual
Basic and Advanced	Ventricular Tachycardia	6 or more PVCs at a rate greater than 130 bpm.	High	Visual
Basic and	High Heart Rate	Heart rate exceeds the value set as the	Off	Off

Basic/Advanced Alarm Type	Medical Alarms	Description	Default Priority	Default Persistence
Advanced		High HR limit.		
Basic and Advanced	Low Heart Rate	Heart rate is below the value set as the Low HR.	Off	Off
Advanced	Bigeminy	Sequence of alternating PVC and normal cardiac cycles.	Off	Off
Advanced	Couplet	Two consecutive PVCs.	Off	Off
Advanced	High PVC	Rate of PVC exceeds the value set for High PVC.	Off	Off
Advanced	Missing QRS	Missing/skipped beat.	Off	Off
Advanced	Trigeminy	Sequence of PVC after every two normal cardiac cycles.	Off	Off
Advanced	Ventricular Multifocal PVCs	PVCs originating from multiple focal points within the ventricles.	Off	Off
Advanced	Ventricular Rhythm	Occurrence of 4 or more PVCs at a rate of less than 100 bpm.	Off	Off
Advanced	Ventricular Run	Occurrence of 6 or more PVCs at a rate less than 130 bpm.	Off	Off

Technical Alarms

Technical Alarms	Description	Default Priority	Default Persistence
Comm. Failure	Data transmission error	Low	Off
Lead Off -- RA, LL,	One or more electrodes are disconnected—one alarm per lead.	High	Off
Lead Off -- LA, V1	One or more electrodes are disconnected—one alarm per lead.	Low	Off
Low Battery	The transmitter battery voltage is low (for example, less than two hours available).	Low	Visual
Almost End of Full Disclosure	The system has logged data to the point that 10 min. or less recording time is available.	High	Audio and Visual
End of Full Disclosure	The system has been logging ECG data to the point that the FD storage file will no longer be able to retain additional trace data. The system will automatically discharge the patient.	High	Audio and Visual

Medical Alarm Abbreviations

Medical Alarms	Abbreviation
Asystole	Asystole
Bigeminy	Bigeminy
Couplet	Couplet
High Heart Rate	High HR
High PVC	High PVC
Low Heart Rate	Low HR
Missing QRS (Pause)	No QRS
Trigeminy	Trigeminy
Ventricular Fibrillation	V Fib
Ventricular Multifocal PVCs	MF PVC
Ventricular Rhythm	V Rhythm
Ventricular Run	V Run
Ventricular Tachycardia	V Tach

Technical Alarm Abbreviations

Technical Alarms	Abbreviation
Almost End of Full Disclosure	Almost EOFD
End of Full Disclosure	End of FD
Attention (Patient Call)	Attention
Battery Low	Low Bat
Lead Off - LL	LL Fail
Lead Off - LA	LA Fail
Lead Off - RA	RA Fail
Lead Off - V1	V1 Fail
Communication Failure	Comm. Failure

Priority

Each alarm has a priority that determines its precedence relative to other alarms. The highest priority alarm for a given monitored patient is indicated on the corresponding patient tile; the highest priority alarm of all monitored patients sounds audibly through the speakers.

In most cases an alarm's priority can be set to **Medium**, **Low**, or **Off**, though there are several exceptions. A priority of **Off** means that the system does not indicate the alarm condition, either visually or audibly, and does not store or print a strip when the condition occurs (except for Patient Call, see *Record and Store*). The condition is detected when not in Standby or Learn modes and can be seen in the Full Disclosure viewer.

A few special cases limit user control over alarm priority. These medical alarms are considered life-threatening and have a fixed priority of **High**.

- Asystole
- Ventricular Fibrillation
- Ventricular Tachycardia

These alarms also have special ordering rules: Asystole always has visual precedence over Ventricular Fibrillation, which always has visual precedence over Ventricular Tachycardia, which always has visual precedence over other high priority alarms. The audio indications for these conditions and other high priority alarms are identical, with no special ordering among them.

The other special cases that limit priority are these technical alarms:

- Lead Off - LL and RA
- Almost End of Full Disclosure
- End of Full Disclosure
- Battery Low

Lead Off for LL (left leg) and RA (right arm) are fixed **High** priority because this condition can mask the life-threatening medical alarms. Almost End of Full Disclosure, which signals that only a few minutes of full disclosure storage remain for the patient, can be set to either **Medium** or **High** priority. End of Full Disclosure is fixed at **High** priority. Battery Low can only be set to **Low** or **Medium** priority (it cannot be **Off**).

The life-threatening alarms; Asystole, Ventricular Fibrillation, and Ventricular Tachycardia, are high priority alarms that cannot be changed. To change the priority setting for the remaining medical and technical alarms, see *Alarms tab*. The ordering from highest to lowest priority is:

- Asystole
- Ventricular Fibrillation
- Ventricular Tachycardia
- High Priority
- Medium Priority
- Low Priority

When a session has more than one alarm of the same priority, secondary sorting rules are applied.

- An alarm with an active triggering condition displays before a persisted alarm of equal priority with a triggering condition that has cleared.
- If all conditions are equal, alarms are presented in the order in which they occurred.

Limits

You can adjust the alarm conditions based upon heart rate for each patient. The limits establish the trigger threshold for the alarms High Heart Rate, High PVC, and Low Heart Rate. These limits are not applicable to other alarms.

The High PVC alarm is triggered when the average number of premature ventricular contractions per minute exceeds the defined limit. The accepted range limit for High PVC is 2-70.

A median heart rate exceeding the limit for High Heart Rate triggers the High Heart Rate alarm; a heart rate below the Low Heart Rate limit causes a Low Heart Rate alarm. The accepted limit range for High Heart Rate is 100-250. For Low Heart Rate the range is 30- 100.

The heart rate must exceed the High Heart Rate limit continuously for at least six seconds to trigger the High Heart Rate alarm.

Record and Store

You can configure any medical alarm to automatically record a strip on the strip recorder and/or store a strip in Full Disclosure when the alarm becomes active. Alarm-generated strips are recorded or stored only when the alarm priority is other than **Off**.

If an alarm is configured to record and/or store a strip, the system generates the strip when the alarm condition is triggered, regardless of its priority relative to other alarms. An alarm does not have to be indicated before its strip is stored in Full Disclosure or queued for printing on the strip recorder.

Alarm Notification

The technical and medical alarm conditions use both visual and audio signals to attract the clinical user's attention.

Notification of alarm will occur within five seconds of the triggering event with the exception of the following alarms:

- Ventricular Fibrillation can take from 5 to 10 seconds to detect.
- Low Heart Rate will be detected after four beats for heart rates less than or equal to 48BPS and after 16 beats for heart rates greater than 48BPS. This results in an alarm notification time of less than 10 seconds for Low Heart Rate.
- High Heart Rate will be detected after 16 beats. This results in an alarm notification time of less than 10 seconds for High Heart Rate.

Visual

Each monitored patient has an associated "tile" that includes a multifunction alarm indicator and user control. The alarm indicator visually communicates the state of the alarm system specific to a patient's session.

When there is no alarm for a patient, the alarm indicator displays the current mode of the session. Standby and Learn modes are represented by the words *Standby* and *Learn*. Normal mode displays with no text and with the background fill the same as the tile.

A bell icon is located next to the visual alarm indicator. This bell icon indicates if audio alarming is currently active but not sounding, sounding due to an alarm or silenced for a given alarm. The bell icon indicates the specific audio state of alarms for the given session and can be used to identify which session is causing the current audio alarm.

Bell Icon	Indication
	Not Sounding - Audio alarming is active but not sounding for this session.
	Sounding - Audio alarming is sounding due to a current alarm.
	Silenced - Audio is temporarily silenced for the current active alarms.

Alarm Priority	Visual Alarm Indicators
High	Rapidly blinking red background
Medium Priority	Slowly blinking yellow background
Low Priority	Non-blinking (static) yellow background

The alarm that has the highest priority (see *Priority*) displays on the visual alarm indicator on the patient tile.

A persisted alarm that has cleared is represented by a green border around the visual alarm indicator. When the green border is present the alarm can be manually dismissed by clicking on the indicator.

Audio

The purpose of the audio alarms is to draw the attention of the user back to the system. When multiple patients are concurrently monitored, it isn't possible to provide useful and distinct sounds for each combination of patient and alarm priority. The visual alarm indicators are designed to communicate the critical information detailing the patient and the alarm condition. The audio indicator communicates an alarm's priority (High, Medium, or Low). When multiple alarms are active, only the sound for the highest priority alarm is sounded. Although each monitored patient has his own visual alarm indicator, the audio alarm indicator is shared by all.

When more than one alarm of the same priority is active, the alarm that triggered first is the one that is sounded. All the High priority alarms, including life threatening alarms Asystole, Ventricular Fibrillation, and Ventricular Tachycardia, share the same sound and thus the same priority within the audio subsystem.

WARNING! Audible alarms.
Do not rely on audio cues alone to gauge the number of patients that require attention. Alarms of equal or lower priority associated with other patients will not be heard while a current audio alarm is active.

Each alarm priority has a distinct sound associated with it.

Alarm Priority	Audible Alarm Indicators
High	Five rapid high-pitched pulses, sounded twice
Medium Priority	Three low pulses, repeated every 25 seconds
Low Priority	Two consecutive tones, repeated every 60 seconds

The **Alarms** tab in the Configuration Utility and the Patient Information screen contain a **Test Alarm** button. Use the **Test Alarm** button to listen to the alarm sounds and to set the speaker volume. The **Test Alarm** button is not available if an audio alarm is active for a patient that is currently monitored.

WARNING! Audible alarms.
Adjust audio volume so that it can be heard over normal background noise and at the distance typical in use.

We recommend maintaining a minimum 30% separation between alarm priorities.

Arrhythmia Detection Modes

The system detects and reports alarms appropriate to the monitoring mode.

Standby

When a patient is first admitted to a monitored session, the patient is in Standby. The session remains in Standby until commanded to enter Learn mode. In Standby, the system does not detect or indicate alarm conditions except for:

WARNING! Alarms. In Standby, the system does not detect or indicate alarm conditions except for:
- Low Battery
- Almost End of Full Disclosure
- End of Full Disclosure

When the patient enters Standby from Learn or Normal modes, all alarms except these three are automatically cleared.

For example, if the Lead Off - LA alarm is active while in Normal mode and the user places the session in Standby, the alarm indication immediately ceases (regardless of its persistence setting). If while in Standby, the system detects a low battery condition in the transmitter, the Battery Low alarm is indicated until the batteries are replaced or the patient is discharged.

Use the **Toggle Standby** button to enter and leave Standby mode. The **Toggle Standby** button is adjacent to the mode indicator. The patient is in Standby mode when the button is selected.

Figure 31 Example of Toggle Standby Button

Active **Standby**

WARNING! Audible alarms.

All medical alarms are disabled when the system is in Standby. Do not toggle to Standby to silence a medical alarm. Use the **Silence Alarm** function (see *Silencing Alarms*).

Learn

When the patient is in Standby, click the **Toggle Standby** button to initiate an approximately 20-second period of learning the patient's ECG characteristics. For example, the system takes about 20 seconds to learn normal rhythm at a rate of 60 bpm or 10 seconds to learn normal rhythm at a rate of 120 bpm.

WARNING! Possible improper system performance.

Do not select Learn mode if the transmitter has a low battery warning or the patient’s waveform is noisy or suspect.

The system identifies the dominant characteristic beat during the Learn mode and uses those characteristics for identifying anomalous beats. The Learn mode is most effective when the patient's ECG is showing mostly normal sinus rhythm.

WARNING! Possible improper system performance.

If the dominant beat during the Learn period is not the dominant characteristic beat, then the system will not be as effective in identification of some arrhythmias.

For instance, if the Learn period is dominated by PVCs, the system is not as effective in identification of alarm conditions involving PVCs. Should you start Learn mode and the patient is presenting a significant run of ectopic beats, toggle back to Standby mode and re-enter Learn mode once the run has subsided.

Normal

After the system has learned the ECG characteristics the system removes the Learn indicator and is in active analysis of the ECG. The blank window signifies that the system is actively looking for arrhythmias.

This is the usual mode of a monitored session in which all alarm conditions are detected and indicated according to their priority. The session automatically transitions to Normal mode following Learn mode and remains in this state until you click the **Toggle Standby** button.

WARNING! RF Interference.
Lead off conditions, ECG noise associated with exercise activities, radio frequency interference or loss of signal and other unusual mechanical or physiological conditions can degrade the detection of some arrhythmias. Clinical staff should always be present and actively monitoring the health and performance of patients currently monitored with Q-Tel RMS. The arrhythmia detection algorithms and associated alarms should not be the sole mechanism for determining the patient's cardiac condition.

Alarm Persistence

Some alarm conditions do not last for a very long time. For instance, a short run of SVT would trigger the High Heart Rate alarm. Because the condition is of such short duration, if you are away from the monitor and the condition clears before you return, the ECG may have scrolled off the screen. There would be no indication that an alarm has occurred. The system allows you to designate that alarms of interest persist. They remain active until you acknowledge and dismiss the alarm. See *Alarms Tab* and *Silencing Alarms* for details and directions on how to turn on/off alarm persistence.

An alarm's persistence setting determines its behavior after its triggering condition has passed.

- **Off**—the alarm indication immediately ceases once the alarm condition passes (that is, the alarm does not persist after the condition clears).
- **Visual persistence**—the visual alarm indication on the patient tile continues after the alarm condition passes, until dismissed.
- **Audio and Visual persistence**—both visual and audio alarm indications continue until the alarm is manually dismissed.

A persisted visual alarm whose triggering condition has cleared is shown with a green border around the visual indicator. To dismiss the alarm, click within the area surrounded by the border. When the green border is not present (the alarm is still active), clicking within the visual indicator has no effect, since only alarms whose triggering condition has cleared can be dismissed.

During the course of detecting a medical condition, sometimes a chain of two or more related medical alarms are triggered. For example, Ventricular Tachycardia is often preceded by the High Heart Rate alarm. When the highest medical alarm clears, other cleared, persisted alarms of lower priority that are masked by it can also clear. To reduce the effort of dismissing a chain of related alarms, when a medical alarm is manually dismissed, other cleared, persisted medical alarms of lower priority are also automatically dismissed. Technical alarms are not automatically dismissed.

For example, when a Bigeminy condition is active, the high priority of this alarm could mask lower priority alarms such as High PVC and Patient Call (Attention). The following table illustrates the alarm queue.

Bigeminy
High PVC
Attention

When the Bigeminy condition clears, a green border is displays around the visual indicator. When the user clicks on the indicator both the Bigeminy and High PVC alarms are dismissed and removed from the queue; Because High PVC is a medical alarm and in this example its triggering condition has cleared, it is dismissed. Patient Call remains persisted even though its condition has cleared because it is a technical alarm. Clicking on the indicator again will dismiss it.

In the special case when an active alarm that has been manually silenced (using the **Silence Alarm** button) becomes clear, the alarm indication automatically becomes blank, as though the alarm's persistence were set to **Off**. By silencing the alarm the technician has acknowledged it, and therefore is not required to manually dismiss it when the alarm condition clears. This behavior only applies to alarms that are currently silenced; if an active alarm is silenced and becomes clear after the silence interval has passed, the alarm indication continues according to its persistence setting as described above.

Here are some additional examples of persistence behavior. The assumptions are: only one alarm is active at a time, and all have a priority set to Medium or Low, the technical alarm Lead Off - LA has persistence **Off**, and medical alarm Bigeminy has **Visual persistence** only.

- If the Left Arm electrode becomes detached, the patient tile indicates a Lead Off - LA alarm and the speakers play the alarm tone. After the lead is reattached, all alarm indications immediately clear without user action since the alarm has no persistence.
- When the arrhythmia analysis algorithms detect a Bigeminy condition, the patient tile indicates the Bigeminy alarm and the speakers play the alarm tone. When the condition clears, the audio indication stops but the alarm is still visible with a green border on the patient tile. To clear the visual indication, click on the tile alarm indicator.

WARNING! Low battery.

When a technical alarm for Low Battery condition occurs and the Low Battery alarm indicator is active, any medical alarm of the same priority as the Low Battery alarm will not take visual precedence over the Low Battery alarm. It is strongly recommended that you replace the battery as soon as possible.

Silencing Alarms

When the audio alarm indicator is active, the Silence Alarm button is enabled, and the speaker icon on the associated patient tile is illuminated.

Clicking the Silence Alarm button temporarily silences the current audio alarm until the interval set within the Q-Tel RMS Configuration Utility (from 30 seconds to three minutes) expires. If other monitored sessions are indicating alarms, then one of these becomes audible according to the priorities. Therefore, if several patients are triggering active alarms then Silence Alarm will have to be pressed multiple times, once for each patient. Once the silence period has expired the alarm will again sound.

For patients with active alarms, selecting the bell icon indicating the current audio state will toggle between Silence Alarm and the alarm audio active state for that patient.

This section describes different alarm scenarios.

Example: Single Session

In this example, the medical alarms Bigeminy and High PVC have settings of Medium priority and Visual persistence and the Bigeminy condition becomes active the Bigeminy alarm is seen in the alarm indicator and a Medium priority audio alarm is heard through the speakers. (See Figure 39.)

Figure 32 Example of Active Bigeminy Alarm

If the High PVC condition becomes active, the Bigeminy alarm remains on the indicator, because Bigeminy is still active and both alarms have the same priority (Medium).

If the Bigeminy condition clears while the High PVC condition remains active, the High PVC alarm is indicated, because active alarms take precedence over equal priority persisted alarms whose conditions have cleared. (See Figure 40.)

Figure 33 Example of High PVC Alarm (Bigeminy Condition Has Cleared)

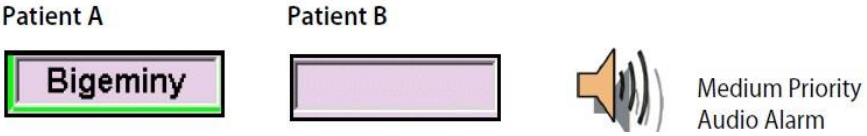
When the High PVC condition clears, both alarms are cleared and have the same priority. Since Bigeminy came first, it is once again shown in the visual indicator, now with a green border surrounding it to show that the alarm is clear and can be dismissed by clicking on the alarm. Because the persistence is Visual rather than Audio and Visual, no audio alarm is heard. (See Figure 41.)

Figure 34 Example of Cleared Condition with Visual Persistence

Click the visual indicator to dismiss both Bigeminy and High PVC alarms as described in section *Alarm Persistence*.

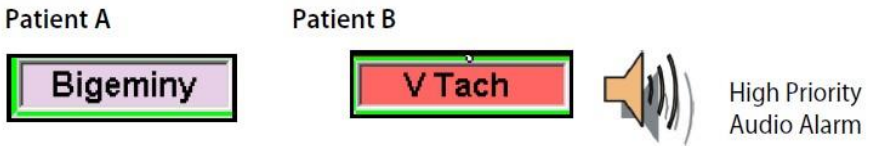
Example: Dual Session

In this example, Bigeminy and High Heart Rate are set to Medium priority for both patients A and B. If Patient A triggers a Bigeminy alarm, the alarm is displayed and heard on the visual and audio indicators.

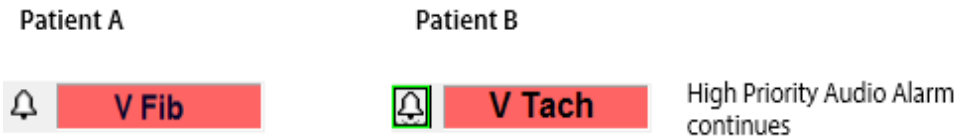


If Patient B's heart rate exceeds the configured limit, it triggers a High Heart Rate alarm. Because both alarms have the same priority and Patient A's alarm came first, no change is heard through the speakers. The previous medium priority audio alarm continues uninterrupted, repeating every 25 seconds.

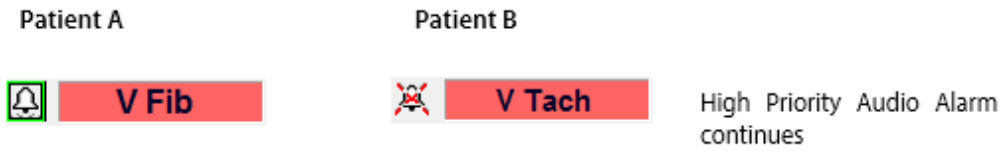
If Patient B progresses into Ventricular Tachycardia, which is a high priority alarm, the medium priority audio alarm associated with Patient A is preempted, and the system alarms with the high priority audio and visual alarm condition.



If Patient A now triggers a Ventricular Fibrillation, the system continues the audio alarm because Ventricular Fibrillation and Ventricular Tachycardia have the same priority, however Ventricular Fibrillation has a higher visual priority than Bigeminy.



Clicking the **Silence Alarm** button, temporarily silences the high priority alarm associated with Patient B, and the high priority alarm associated with Patient A is audible (both have the same sound; what will be heard is an interruption in the normal ten second repetition cycle as the audio alarm associated with Patient A is started from the beginning). After the temporary silence interval expires, the audio alarm is associated with Patient A.



SESSION RECOVERY

The Q-Tel RMS system includes a Session Recovery feature which recovers usable system data following a PC failure.

The Session Recovery feature restores the data up to the point of the system failure. The system may be able to recover:

- An entire session
- A partial session

Some sessions cannot be recovered, for example, if ECG integrity is not intact, the system was down for a long period of time, or the session did not have enough data to recover.

Session Recovery Screen

Use the Session Recovery screen to continue, discharge, or discard sessions affected by the system failure.

When the system recovers from a system failure, it detects partial systems that are available for recovery. A session is available for recovery if:

- There is enough session data.
- The recovery is started within the necessary time frame for a monitored patient. (Data that is out of date cannot be recovered for a monitored patient.)
- The ECG data integrity for monitored patients, is intact. The Session Recovery screen contains:
- The list of recovered sessions
- Session data for the selected patient

Field	Description
Patient	The list of patients that have recovered sessions.
MRN	The MRN (Medical Record Number) uniquely identifies the patient.
Session No.	Number of recovered sessions.
Date	Date and time the session began.
Monitored	Indicates whether or not the session was monitored. • **Yes**—Monitored • **No**—Non-Monitored
Recovery Option	Indicates how to handle the session. The system defaults to **Continue** if the session can be continued and to **Discard** if the session had been suspended for too long. • **Continue**—Continue the session from where it left off. • **Discharge**—End the session and discharge the patient. • **Discard**—Delete the partial session.
Channel	The channel assigned to the patient when the system failed.
Session Management Fields	See *Patient Session Data Tabs*. All fields are system-generated and cannot be edited.
Critical Comment Tab **Clinical Comment Tab** **Patient Comment Tab**	See *Comments Tab*.
Reason for Discharge **Discharge Action**	See *Discharge Tab*.

Field	Description
Print Reports **Q-Exchange**	
Full Disclosure Strips	See *Full Disclosure Tab*.
Start Session Recovery	Starts the session recovery by continuing, discharging, discarding the sessions as designated by the selection in **Recovery Option**.
Exit Application	Exits the recovery screen.

Recovering a Session

If the PC running the Q-Tel RMS system experiences a system failure due to a power outage, hardware failure, or other problem, the Q-Tel RMS system may be able to continue some of the incomplete sessions.

When the PC is functional, you must determine the status of the existing sessions before starting another session.

To recover a session from the same tower:

1. Restart the system. The system prompts for restoring an incomplete sessions. You cannot start a new session until the incomplete sessions have been recovered or discharged.
2. Click **OK**. The system displays the **Session Recovery** screen.
3. For each patient:
   a. Select a patient in the Patient List. The system displays the session in the **Session Management** and **Full Disclosure** fields.
   b. Use the **Session Management** fields and **Full Disclosure** fields to determine if the session should be recovered. If the patient displays in the color red, the patient is locked on another system. You must discard the patient or discharge them from the session on the other system.
   c. Add comments to the session.
   d. Select **Continue**, **Discharge**, or **Discard** from the **Recovery Option** field.
   e. If the patient is to be discharged, make selections for:
      - **Reason for Discharge**
      - **Discharge Action**
      - **Print Reports**
      - **Q-Exchange**
4. Click Start Session Recovery. The session executes the recovery of all patients as a group.
   - If any patients are marked for **Discard**—the system displays a confirmation dialog box.
   - If any patients are marked for **Discharge**—the modality shows as complete and the interruption does not display on the full disclosure strips.
   - If any patients are marked for **Continue**—the time gap displays as a yellow line on the full disclosure strips.

   The sessions will re-number according to whether a new session is started on a different tower.

To recover a session from another tower:

1. From the **Session Management** screen, select the patient for a session. The system displays a dialog box indicating the patient has an incomplete session on another tower. Starting a new session without recovering the existing session prevents the recovery of the incomplete session.
2. Click **OK** to begin a new session or **Cancel** to recover the session on the other tower.

CONFIGURATION UTILITY

The Q-Tel RMS Configuration Utility defines and configures system settings to control the overall behavior and capability of the Q-Tel RMS monitoring application. This includes defining exercise devices and patient parameters for monitoring, configuring clinical and technical alarm conditions and selecting default ECG lead configurations.

- You cannot run the Configuration Utility while the Q-Tel RMS application is open.
- In a networked Q-Tel RMS configuration, the Configuration Utility can run on only one tower at a time.

You must be logged into the system using an account with administrator privileges in order to run the Configuration Utility. If your login account does not have administrator privileges, you cannot open the utility.

Accessing the Configuration Utility

To access the Configuration Utility screen:

1. Double-click the **Q-Tel RMS Configuration** icon on the desktop. The configuration utility displays.
2. Click on the tab you want to access.

The Configuration Utility tabs contain buttons that are common on many of the tabs. These buttons are described in the following table.

Button	Description
Save	Saves the changes. Click **Save** before exiting the tab to save changes.
Cancel Changes	Discards the changes to the tab. If you inadvertently make a change or delete an item, select **Cancel Changes** before switching tabs or clicking on **Save**. This restores the changed or deleted field(s).
Add New	Opens a new line for adding a new selection.
Delete	Removes the selected custom selection.

Parameters Tab

Parameters represent the data that is measured or quantified during a patient session. Examples of parameters are patient heart rate, blood pressure, target heart rate, RPE and METS. Use parameters to:

- Capture patient data, such as heart rate, blood pressure and RPE, during rest, exercise and recovery.
- Record data about the exercise device (or modality), such as speed and grade for a treadmill.
- Capture data that will be used to calculate METS.

You can define the minimum and maximum values that will be allowed for each Parameter.

The Q-Tel RMS program is pre-loaded with a list of commonly used parameters. You can add other parameters as needed.

Parameter Definitions

The **Parameters** tab contains the parameter definitions.

Field	Max Length	Description
***Name**	50	Required field. A unique name for the parameter. Use this name to describe the parameter.
***Label**	8	Required field. A short unique name for the parameter. This label displays in grids and selection controls across the system.
***Units Category**	--	Required field. A drop-down menu to select the label of the units for a particular parameter. The category you choose has no effect on calculations or display in the system. Choose **No Units** when the parameter does not have units. For example, an RPE rating is simply a number and has no units.
Type	--	Drop-down menu for the type of field. Options are: **Number** **Text**
MIN	--	The meaning of MIN depends on the selected type. If **Type** is set to **Text**—**MIN** is the minimum number of characters allowed for the parameter. If **Type** is set to **Number**—**MIN** is the smallest allowable value for the parameter.
MAX		The meaning of MAX depends on the selected type. If **Type** is set to **Text**—**MAX** is the maximum number of characters allowed for the parameter. If **Type** is set to **Number**—**MAX** is the largest allowable value for the parameter.
Precision	--	The meaning of Precision depends on the selected type. If **Type** is set to **Text**—**Precision** is not used (the field is blank). If **Type** is set to **Number**—**Precision** is the number of decimal places (up to two) to display and record.
Description	80	Record notations about the parameter or its use within the system.

System-defined Parameters

System-defined parameters are supplied by the system. They cannot be deleted. You can edit the label and the description.

Name	Label	Type	Min Val	Max Val	Prec	Units	Description
Average Heart Rate	AvgHR	Number	0	300	0	Bpm	
BMI Rating	BMI	Number	0	60	0	No Units	Body Mass Index - measure of obesity (expects Weight in pounds and Height in inches).
Diastolic BP	diaBP	Number	1	399	0	mm-Hg	XXX/YY - the YY in blood pressure.

Name	Label	Type	Min Val	Max Val	Prec	Units	Description
Distance	Dist	Number	0	1000	0	Ft	Distance walked in 6 or 12 minutes.
Ectopic rate	ER	Number	0	300	0	Bpm	Number of ectopic beats per minute.
Glucose	Glucose	Number	0	500	0.0	mg/dL	Blood Sugar
Grade	Grade	Number	-30	30	0.0	%	Treadmill grade (slope).
Heart Rate	HR	Number	0	300	0	Bpm	Number of beats per minute.
Level	Level	Number	0	5	0.0	No Units	Airdyne Level
Max Heart Rate	MaxHR	Number	0	300	0	Bpm	The maximum heart rate detected during a time interval.
Max predicted HR	MaxPHR	Number	0	300	0	Bpm	HR predicted from age.
METS	METS	Number	1	30	0.0	No Units	Metabolic output - related to Workload.
Min Heart Rate	MinHR	Number	0	300	0	Bpm	Minimum Heart Rate.
Oxygen Sat.	SpO2	Number	50	100	0.0	%	Oxygen saturation in blood.
O2 Flow	02Flow	Number	0	20	0	l/min	Measurement of oxygen flow given to pulmonary patients.
Percent Target HR	% THR	Number	0	500	0	%	Percent of Target Heart Rate (actual HR/tHR).
Rate	Rate	Number	0	250	0	Per Min	Steps per minute.
Rate of Perceived Dyspnea	RPD	Number	0	20	0	No Units	Scale for rate of perceived dyspnea.
RPE	RPE	Number	0	20	0	No Units	Rate of perceived exertion.
Speed	Speed	Number	0	15	0.0	MPH	Treadmill speed.
Step Height	Step Ht	Number	0	30	0	Inches	Exercise device step height in inches.
Systolic BP	sysBP	Number	1	400	0	mm-Hg	XXX/YY - the XXX in blood pressure
Target Heart Rate Range	tHR	Number	0	300	0	BPM	Number or range (for example: 110-120).
Target Heart Rate	tHR Calc	Number	0	300	0	BPM	Heart rate goal.
Watts	Watts	Number	0	1000	0	Watts	Power measure for some exercise device.
Weight	Wt	Number	0	500	0.00	Lbs	Patient weight

Name	Label	Type	Min Val	Max Val	Prec	Units	Description
Workload	Workload	Text	0	0		No Units	Device specific metrics for patient workload.

Defining Custom Parameters

Use the **Parameters** tab to define custom parameters.

Adding a New Parameter

To add a new parameter:

1. Click **Add New**. An additional line displays at the bottom of the table.
2. Double-click in the **Name** field and enter the parameter name. When you move from the Name field to a different field, the system automatically moves the parameter into its alphabetical position in the list.
3. Click in the **Label** field and enter the label for the parameter.
4. Select a units category from the drop-down menu. The **Units Category** field is required. If the parameter does not have units, double-click on the field and select **No Units** from the drop-down menu.
5. To change type, double-click in the **Type** field and select an option from the drop- down menu.
6. To set parameter values, double-click and use the scroll arrows in the **MIN**, **MAX**, and **Precision** fields.
7. To enter a description of the parameter, click in the **Description** field and enter the information.

Changing a Parameter

To change a parameter:

1. Click on the cell in the grid you want to change.
2. Enter your change. You cannot change the Type field once the parameter is saved.

Deleting a Parameter

You can delete a custom parameter. System-defined parameters cannot be deleted. To delete a custom parameter:

1. Click on the name of the parameter you want to delete.
2. Click **Delete**.
3. Deleting a parameter does not affect modalities or prescriptions that already use this parameter. The parameter continues to be available in those cases.

Modalities Tab

The **Modalities** tab describes each modality.

The standard rehab facility uses a set of exercise devices in the programs they administer. The Q-Tel RMS application refers to these as Modalities. Definitions of the most common modalities in rehabilitation are pre-loaded on your Q-Tel RMS system. Included in the definition of each device is the standard equation(s) that convert exercise data into METS.

All preconfigured device information can be updated as needed. The preconfigured system Modalities list includes these devices:

- AirDyne
- Arm Ergometer
- Bands
- Step Machine
- Leg Ergometer
- Nu-Step and Nu-Step Q
- Treadmill
- Weights

You can define additional exercise devices to meet the needs of your facility. You can define as many devices as you need.

Field	Max Length	Description
***Modality**	16	Required field. A unique name for the Modality. Use this name to describe the modality.
Wkld Parm 1	--	Required field. A drop-down menu for the workload name to describe the modality.
Units Category	--	System generated field. (From the **Parameters** window.)
Wkld Parm 2	--	An optional workload parameter to use for the METS equation.
METS label	9	Identifies the METS equation.
Abbr	5	A short identification for the METS equation.
***METS Equation (use P1 and P2 to enter parameters**	50	The mathematical expression of the METS equation. Enter P1 and P2 for Wkld Parm 1 and Wkld Parm 2 when you enter the equation. The system automatically replaces the placeholders with the label in the field.
Remove Modality	--	Removes a custom modality.
Add METS	--	Adds a METS equation
Delete METS	--	Deletes a METS equation
Default METS	--	Return to Default METS equation.

Workload Parameters

One or two parameters can be selected for inclusion in the METS equation for each modality. These are referred to as *Workload* parameters. For example, Speed and Grade are commonly used as workload parameters in the METS equation for a treadmill. When a patient prescription is defined, the values for the workload parameters can be entered to show the METS value you want the patient to achieve.

Only parameters defined as a number type can be used in a METS equation.

METS Equations

The METS equation(s) for a modality can be any mathematical expression using addition, subtraction, multiplication or division.

> ***NOTE**: For non-parameter workload, such as Bands, the workload does not display properly if you enter a backslash character (\) in the input text.*

You can define more than one METS equation for an exercise device. In some cases there are different equations depending upon the mode of use. For example, the METS produced on a treadmill is higher when running than when walking, even if the speed and grade are the same. Q-Tel RMS supports up to three different METS equations per modality.

If no METS equation is defined, you can enter text in the workload field when the modality is included in a prescription.

Defining a Modality

The parameters used in the equation, must be listed in the Parameter list. For instance, if the exercise device reports *Calories* then be sure to first add a parameter into the system named *Calories*.

Adding a Modality

To add a new exercise modality into the system.

1. Click **Add New** on the **Modalities** tab.
2. Enter the name of the device in the **Modalities** field. The name of the Modality must be unique and can have up to 16 characters. When you tab from the Modality field the system moves the device listing into its alphabetical position in the list.
3. Double-click on the **Wkld Parm P1** field and select the first parameter to be used in the METS equation from the drop-down menu. The system automatically fills in the Units field.
4. If the equation requires a second parameter, use the second **Wkld Parm P2** field and select the parameter from the drop-down menu.
5. To identify the METS equation:
   a. Click on the **METS Label** field and enter the name for the METS equation.
   b. Click on the **Abbr** field and enter an abbreviation of the METS Label.

   If the exercise device has only one mode, the **METS Label** and **Abbr fields** are optional. If there are two METS equations, the METS Label and Abbr fields are optional. The METS Label is used in a drop-down menu for equation selection when entering patient workloads and the corresponding abbreviation is displayed in the Workload field for the modality when used in a prescription.

   METS Labels and abbreviations are linked. If you select a label that already exists, the Abbr field is automatically filled with the abbreviation for that METS Label. If you change an abbreviation for a label, all exercise modalities that use the label are automatically updated with the new abbreviation.

6. In the *** METS equation** field, double-click to enter the equation using *P1* and *P2* to represent the parameters in the equation. For example, if the METS equation is:
   `1 + 0.25*Watts + 0.023*Watts*Watts/Weight`

   Where the first parameter is Watts and the second parameter is patient Weight, enter the equation as:
   `1 + 0.25*P1 + .0023*P1*P1/P2`

Use standard math symbols for addition (+), subtraction (-), multiplication (*), and division (/). If necessary, use parenthesis to define the order of the operations. Q-Tel RMS uses standard math order of operations, multiplication and division operations are performed before addition and subtraction operations unless specified by parenthesis.

7. To enter a second equation for METS:
   a. Select the modality.
   b. Click Add METS.
   The system adds a second row below the modality. Enter the corresponding parameters and equation. Be sure to include the label and abbreviation information

Setting the Default METS Equation

The first equation in the list for the specific exercise device is the default selection for entry of patient workloads during a session.

Make the most common mode the default to minimize typing during an active session. For example, since most rehab patients walk on the treadmills, the Walk equation is the default.

To change the default METS equation:

1. Click on the equation you want to be the default.
2. Click **Default METS**.
   The selected equation will change position to become the first METS equation line for the exercise modality.

Editing or Deleting Modalities

To change a modality or METS equation:

1. Click on the cell in the grid you want to change.
2. Enter your change.
   If you edit a METS equation, the previous equation continues to be used for any patients or program with that METS equation selected in the prescription. The new equation can be selected from the METS equation pull-down list in the prescription for the patient or program. The METS label for the previous equation is distinguished with a "~".

To delete a modality from the system:

1. Click on the modality name.
2. Click **Remove Modality**.
3. To remove a METS equation for a modality with multiple METS equations, click on the METS equation and then click Delete METS.
   If you delete a METS equation or an exercise modality, that equation or modality continues to be used for any patient who had it selected in the prescription. Once removed from the prescription, it will not be selectable.

System-defined Modalities

The system-defined modalities and METS are preconfigured in the Q-Tel RMS.

Modality	Wkld Parm P1	Wkld Parm P2	METS Label	Abbr.	METS Equation
AirDyne	Level	Weight			1 + 377 * Level/Weight
Arm Ergometer	Watts	Weight			1 + 11.3 * Watts/Weight
Bands					
Leg Ergometer	Watts	Weight			1 + 7.54 * Watts/Weight
Nu-Step	Watts	Weight	<115 Watts	<115	(-108. + 1.89 * Weight + 4.23 * Watts)/Weight
			>=115 Watts	>115	(-5.45 + 2.22 * Weight + 0.024 * Watts * Watts)/Weight
Nu-Step Q	Watts	Weight			1.73 + 0.85 * Watts/Weight + 0.0223 * Watts * Watts/Weight
Step Machine	Rate (steps/min.)	Step Ht			0.1 * Rate + 0.0174 * Rate * Step Ht
Treadmill	Speed (miles/hr.)	Grade (5% grade entered as “5”)	Walking	W	1 + 0.766 * Speed + 0.138 * Speed * Grade
			Running	R	1 + 1.53 * Speed + 0.0676 * Speed * Grade
Weights					

NOTE: *Patient weight (**Weight**) and Step Height are entered in pounds and inches respectively.*

The METS equations the above table are from these sources:

- American College of Sports Medicine Guidelines for Exercise Testing and Prescription, Fifth Edition, Williams and Wilkins, 1995.
- Nu-Step - Evaluation of MET Values on Recumbent Nu-Step 4000, Chad Rateike, University of Wisconsin-LaCrosse, June 2000. This work has defined two equations, each valid for a range of workloads (less than 115 Watts and greater than or equal to 115 Watts).
- Nu-Step Q - Derived from Rateike's work to provide a simplified form for input. The standard deviation of this equation, relative to Rateike's, for the range of use in rehab, is about 0.25 METS. The derivation has been done to simplify input during a session, as the user does not have to notice if the Watts is greater or less than 115 and choose the correct corresponding equation.

Caution: Units for weight.

Those equations that require input of patient weight have been converted to use weight measured in pounds.

METS Unit of Measure

The units of measurement for weight and height in the system are optional. However, the units of measurement in the METS equations that ship with the system are in pounds and inches. When you configure the parameters in your system you can choose to change these. For your convenience, provided below are the equivalent METS equations for modalities involving weight, converted to use kilograms instead of pounds.

Name	Wkld Parm 1	Wkld Parm 2	METS Equation
AirDyne	Level	Weight	1 + 171 * Level/Weight
Arm Ergometer	Watts	Weight	1 + 5.14 * Watts/Weight
Leg Ergometer	Watts	Weight	1 + 3.43 * Watts/Weight
Nu-Step	Watts	Weight	< 115 Watts: (-49.1. + 1.89 * Weight + 1.92 * Watts)/Weight
			>= 115 Watts: (-2.48 + 2.22 * Weight + 0.011 * Watts * Watts)/Weight
Nu-Step Q	Watts	Weight	1.73 + 0.39 * Watts/Weight + 0.01 * Watts * Watts/Weight

Refer to *Defining a Modality* for specific instructions.

Programs Tab

The Program is a plan for a course of rehabilitative treatment. Programs vary depending upon the type of patient or rehab strategy. The two programs included with Q-Tel RMS are Cardiac and Pulmonary.

Within a particular patient population there can be subgroups for which your facility would like to tailor a rehabilitation program. For example, you can design a program specifically for diabetic patients within the Cardiac group. In this Cardiac/Diabetic program, you can include glucose measurements that otherwise would not be necessary.

Q-Tel RMS allows you to define and customize up to 32 Programs.

Define the new program using an existing program. The system creates the new program with the attributes of the existing program. Edit the new program. Programs can be edited or deleted at any time.

Patients are enrolled in a program either when they are registered or when they are admitted to a session for the first time. Changes to a program affect new patients, not patients already partially through an existing program.

The procedures in this section describe how to customize a program.

Defining a Program

To define a program:

1. Click on **Add New**. The system displays the **Add new program** dialog box.
2. To use an existing program as a template, click the radio button for **Use existing program as a template** and then select the program from the drop-down menu. The system automatically fills the **Type** and **Sub Type** fields with the entries from the selected Program template.
3. To create a new program without reference to an existing program, click the radio button for **Create new program**.

4. Enter the name in the **Program Name** box. Select from the drop-down menus or enter in the **Program Type** and a **Sub Type** (if there is one). If you enter a new name, it is automatically added to the drop-down menu in its category.
5. Click **Save** to save your new type or click on **Cancel Changes** to return to the Programs menu without saving changes.

Parameters

For a particular program you can customize the parameters that you want to track during the rest, exercise and recovery phases of a session. These will serve as a basis for the patient's program, but can be modified for a particular patient. Some of the parameters are always enabled and cannot be deleted.

To select parameters to track:

1. Click on the **Parameters** Tab (under the **Program** tab).
2. Check any parameters you want to record during rest, exercise or recovery for this program. Use the scroll bar on the right to access the complete list of parameters.

The following table displays default program parameters that are automatically selected for a program. Those marked as "P" cannot be deleted from a program.

%tHR and **Weight** are automatically selected as noted below. However, they can be removed from a program by unchecking the corresponding box.

	Cardiac				Pulmonary			
Parameter	**Rest**		**Exercise**	**Recovery**	**Rest**		**Exercise**	**Recovery**
%tHR			✓				✓	
Dia BP & Sys BP	P		P	P	P		P	P
HR	P		P	P	P		P	P
METS	P		P	P	N/A		P	N/A
RPE	P		P	P	P		P	P
SPO2	P		P	P	P		P	P
tHR	✓						✓	
Weight	✓						✓	
Workload	P		P	P	P		P	P
O2 Flow					✓		✓	✓
RPD					✓		✓	✓

Phases of a Prescription

The first phase of the prescription is Rest. During this time, the patient's resting parameters are taken. The Rest phase must always be first and can never be omitted.

The Rest phase is followed by zero or more exercise activities. Select an exercise device from your pre-defined list of exercise modalities (for example: Bike), add the desired values into the workload parameters, if any (for example 10 Watts) and a duration (such as 5 minutes).

The last phase of the prescription is Recovery, where the patient is monitored while the heart rate and blood pressure return to near resting levels. Unless discharged or cancelled early, Recovery is always the last phase.

For each Program, define a starting prescription. Use the Patient Information screen Prescription tab to make changes for each patient. The default prescription contains a list of exercise devices (the Modalities), the prescribed exercise duration, and expected Workload (for example, the expected speed and grade for the treadmill). The prescription can also control when ECG strips are stored and recorded.

To add a new exercise device into the prescription:

1. Click the **Add New** icon. The system displays a blank line.
2. Double-click in the **Modality** field and select an exercise device. Any exercise device can be represented in a prescription more than once. The exercise prescription will support up to 12 exercise activities.
3. Tab to **Duration** and double-click on that field to activate the up and down arrow keys. (You can also enter the duration time.)
4. Tab to **Timed** and click in the check box to change the default. Depending on the type of modality, you may or may not want to use timers. You can designate your preference in the prescription for each modality and also choose the exercise duration allotted.
5. Tab to **Workload** and enter the values. You can identify the workload for a selected device by entering values for the associated workload parameters (see *Workload Parameters*). The system computes the METS for the entered workload values as long as a METS equation has been defined for the selected device. You can leave this field blank.
6. Tab to **Store Strip** and double-click in the field to select the **Store Strip** option.
7. Tab to **Record Strip** and double-click in the field to select when you want to print a strip.

Storing or Recording Strips

For any exercise activity in the prescription, specify whether a strip is to be stored, recorded or both stored and recorded during any exercise modality. The options are as follows:

- Midpoint between the starting and completion of the exercise on the device.
- At the time of maximum heart rate.
- At the time of the minimum heart rate.
- 30 seconds before the modality was terminated.
- 60 seconds before the modality was terminated.
- Start of the modality.
- In seconds after the beginning or n seconds before the termination of the modality (Custom).
- No (no strips desired).

Strips are centered on the criteria selected.

Programs Tab Fields

Field	Max Length	Description
Program	20	Enter the name of the program. You can base the new program on an existing program. The new program retains the attributes of the parent program. You can then modify the attributes of the new program. Programs can be edited or deleted at any time. Patients are enrolled in a program either when they are registered or when they are admitted to a session for the first time. Changes to a program affect new patients, not patients already partially through an existing program.
Program Name		Name of the program. Uniquely identifies a particular program. Once a program is named, you can edit the name. Patients already enrolled in the program retain the original name.
System default **Make system default**	--	• If the program is the system default, then System default displays. • If the program is not the system default, then Make system default displays. To make the program the system default, click in the check box. You cannot delete the default program.
Program Type	--	Programs are divided into type categories. You can define your own types. The system defaults are: Cardiac Pulmonary
Sub Type		A smaller category within the program. For example, a cardiac patient could be diabetic, and you want to define a Diabetic Sub Type.
Parameters tab		
Rest		A checkmark indicates the parameter is included to track the parameter in the rest phase. To remove or add a checkmark, click the check box. Some parameters cannot be deleted.
Exercise		A checkmark indicates the parameter is included to track the parameter in the exercise phase. To remove or add a checkmark, click the check box. Some parameters cannot be deleted.
Recovery		A checkmark indicates the parameter is included to track the parameter in the recovery phase. To remove or add a checkmark, click the check box. Some parameters cannot be deleted.
Session Configuration tab		
Default Number of sessions		Define the expected number of sessions for a patient enrolled in this program. When you enroll a patient, you can specify the number of sessions that are authorized for reimbursement. To increase or decrease the number of sessions, use the scroll arrows or enter the number of sessions.
Prescription		A rehab prescription is your protocol for guiding a patient through a rehab session to achieve cardiovascular goals. The prescription fields can be changed according to the instructions for changing the prescription in the **Patient Information** screen. See *Prescription (Rx) Tab*.

Alarms Tab

Use the **Alarms** tab to change default settings for the alarms.

Q-Tel RMS notifies the user when certain patient medical or technical conditions arise. Use the Configuration Utility to set the standard baseline response to alarms. Alarms fall into these categories:

- Medical Alarms—Alarms corresponding to the patients' medical condition. Specific alarm availability is dependent on your system configuration.
- Technical Alarms—Alarms corresponding to the system or technical conditions.

For each type of alarm, the system allows you to configure several attributes. More information on alarms is available in *Alarm Subsystem*.

Alarm Sound

The system issues a different sound for each alarm priority. The sound is set by the system and cannot be changed. The sound will repeat at different intervals depending on the priority of the alarm.

Main Volume

Since different hardware and speakers can have varying volumes, the **Volume Adjust** control allows you to set the alarm volume based on your needs. The **Volume Adjust** setting is stored on the machine where it is set; therefore, in a multi-tower configuration, it must be set on each tower.

To change the volume:

1. Select the **Alarms** tab in the Q-Tel RMS Configuration Utility.
2. For each alarm priority in the Priority/Volume table.
   a. Select the alarm priority. The name of the alarm test button changes to indicate the selected alarm priority.
   b. Click the test alarms button. The system sounds the alarm.
   c. To make the volume louder, increase the **Volume Adjust** number (which is a percentage of maximum volume).

When using external stereo speakers, we recommend maintaining a minimum 30% separation between alarm priorities.

Medical Alarms

The following table shows the medical alarms supported by Q-Tel RMS and the values associated with their priority and persistence as set by the system. You cannot change the priority of those alarms predefined with a High priority, but you can change the priority of all other medical alarms.

You can select and configure only those medical alarms enabled for your system configuration. Reference *Alarm Subsystem*.

Alarm	Description	Default Priority	Default Persistence
Asystole	Absence of a QRS complex for four or more seconds.	High	Visual
Ventricular Fibrillation	Irregular ECG signal with no recognizable QRS complex.	High	Visual
Ventricular Tachycardia	6 or more PVCs at a rate greater than 130 bpm.	High	Visual

Alarm	Description	Default Priority	Default Persistence
Bigeminy	Sequence of alternating PVC and normal cardiac cycles.	Off	Off
Couplet	Two consecutive PVCs	Off	Off
High Heart Rate	Heart rate exceeds the value set as the High HR limit.	Off	Off
High PVC	Rate of PVC exceeds the value set for High PVC.	Off	Off
Low Heart Rate	Heart rate is below the value set as the Low HR.	Off	Off
Missing QRS	Missing/skipped beat.	Off	Off
Trigeminy	Sequence of PVC after every two normal cardiac cycles.	Off	Off
Ventricular Multifocal PVCs	PVCs originating from multiple focal points within the ventricles.	Off	Off
Ventricular Rhythm	Occurrence of 4 or more PVCs at a rate of less than 100 bpm.	Off	Off
Ventricular Run	Occurrence of 6 or more PVCs at a rate less than 130 bpm.	Off	Off

These life-threatening conditions have high priority alarms that cannot be changed.

- Asystole
- Ventricular Fibrillation
- Ventricular Tachycardia

The following table shows the lower and upper limits between which the alarm rate value can be set for types of alarms.

Alarm Type	Lower Limit	Upper Limit	Default Value
High HR	100	250	150
Low HR	30	100	50
High PVC	2	70	10

Only the Medical alarms that you specify for a patient in the Patient Information component are triggered for that patient. The alarm setting (priority, persistence, limits, store, and record) are initially set to the values configured in the Configuration Utility and can be customized for each patient.

Technical Alarms

The following table shows the technical alarms supported by the Q-Tel RMS and the values associated with their priority and persistence as set by the system. You can change the priority and persistence of these alarms as necessary, except those that have a High priority.

Alarm	Description	Default Priority	Default Persistence
Comm. Failure	Data transmission error.	Low	Off

Alarm	Description	Default Priority	Default Persistence
Lead Off – LL, RA	One or more electrodes are disconnected – one alarm per lead.	High	Off
Lead Off – LA, V1	One or more electrodes are disconnected – one alarm per lead.	Low	Off
Low Battery	The transmitter battery voltage is low (for example, less than two hours available).	Low	Visual
Almost End of Full Disclosure	The system has logged data to the point that 10 minutes or less recording time is available.	High	Audio and Visual
End of Full Disclosure	The system has been logging ECG data to the point that the FD storage file will no longer be able to retain additional trace data.	High	Visual (see Note below)

NOTE: *The ECG full disclosure capacity is approximately four hours. When the Full Disclosure file has reached capacity, the patient will be automatically discharged. The* ***Almost End of Full Disclosure*** *alarm will activate, even if the system is in Standby mode. The alarm will activate at each of these times before the end of ECG recording occurs:*

- *10 Minutes*
- *7 Minutes*
- *3 Minutes*

NOTE: *The default persistence for* ***Almost End of Full Disclosure*** *cannot be changed. At the End of Full Disclosure, the patient will be discharged, the alarms will be cleared, and the ECG display removed—Alarm persistence has no meaning when the ECG display is removed.*

The low battery alarm also activates even when the system is in standby.

Field	Description
Alarm Silence duration (Secs)	When an alarm occurs during a session you can silence it for a period from 30 seconds to 3 minutes. After it is silenced, the alarm continues to show visually. At the end of the silent period, the alarm sounds again, unless the alarm condition has ended. Any other alarm conditions that occur will sound. Silencing an alarm only silences the current alarm condition.
Test High Alarms **Test Medium Alarms** **Test Low Alarms**	To test the volume and make sure it is set at the correct level: • Click the **Test Alarm** button. • Increase or decrease the **Volume Adjust** until the volume level is appropriate.
Volume Adjust	Sets the default volume level. The system allows you to adjust the volume for each priority level. A test function is provided on the **Alarms** tab so that you hear the sound and volume of each alarm as you configure it.
Priority	The system changes the **Test Alarm** button to reflect the selected alarm priority. Use **Volume** to set the **Alarm** volume.
Volume	To change the volume on an alarm priority: 1. Double-click in the **volume** field. 2. Select the volume percent from the drop-down menu. The High priority must be louder than the Medium and Low priorities. The Medium priority must be louder than the low priority. 3. Click **Save** to save your changes.

Field	Description
Priority	Each alarm has a priority that determines its precedence relative to other alarms. Select: **Off**, **Low**, or **Medium**.
Persistence	An alarm's persistence setting determines its behavior after its triggering condition has passed. For patient call select: **Audio and Visual**—both visual and audio alarm indications continue until the alarm is manually dismissed.
Store	Saves an ECG strip. The event is centered as in the **Record** option below.
Record	The ECG is printed on the laser printer, depending on your system hardware and configuration settings. The length of the strip is defined by the default setting as configured in **Trace Setup** under the System Setup tab in the Configuration Utility. The event is centered. This means that if the default recorder setting is 20 seconds, 10 seconds of the recording is prior to the event, and 10 seconds after the event.
Medical alarms and Technical alarms	Type of alarm.
Limit (Medical alarms only)	Set the threshold for the alarm condition based upon heart rate for each patient. Establish limits for the alarms: **High Heart Rate**, **High PVC**, and **Low Heart Rate**. These limits are not applicable to other alarms
Persistence	Determines the alarm's behavior after its triggering condition has passed. • **Off**—the alarm indication immediately ceases once the alarm condition passes (the alarm does not persist after the condition clears). • **Visual**—the visual alarm indication on the patient tile continues after the alarm condition passes, until the alarm is manually dismissed. • **Audio and Visual**—both visual and audio alarm indications continue until the alarm is manually dismissed.
Priority	A drop-down menu to assign the importance of the medical or technical condition relative to other medical or technical conditions. Options are: • **Off** • **Low** • **Medium** • **High** (selected alarms only) The priority of alarms for life-threatening conditions is permanently set to High. The priority of most other alarms can be set to Medium, Low, or Off. Medical alarm settings can also be customized for each patient. See *Alarms Tab*.
Record (Medical alarms only)	Automatically record a strip on the printer
Store (Medical alarms only)	Store a strip in Full Disclosure when the alarm becomes active

List Maintenance Tab

Use the **List Maintenance** tab to enter, edit, or delete items for lists. You can maintain these lists:

- Country
- Exercise Activity Type
- Med Dosage Units
- Medication
- Medication Class
- Medication Delivery Method
- Medication Frequency
- Modality Equation Type
- Race Ethnicity
- Rehab Program Subtype
- Relationship
- SCP Diagnosis
- SCP Secondary Diagnosis
- State Province

Changing a list item affects only new patients or programs. Patients or programs with that item already selected continue to use the original entry.

To maintain a list:

1. Click on the down arrow by the list field. The system displays a menu with all the lists.
2. Highlight the list you want to change. The system displays the items currently on the list.
3. To add a new item:
   a. Click **Add New** to add a new item. The system displays a new line.
   b. Type in the name of the new item and the press **ENTER**. The system automatically alphabetizes the item.
4. To make changes to an existing item:
   a. Double-click on the item. The cursor changes to an I-bar.
   b. Use the backspace key or the arrow keys to navigate. You can also highlight the entire line and type in a new item.
5. To delete an item on a list, click anywhere on the line and then click **Delete**. The system removes the item from the list.
6. Click **Save** to save the list or **Cancel Changes** to return to the original list.

The following table describes each field.

***NOTE**: Some displayed fields may be truncated.*

Field	Description
List	Displays the available lists in a drop-down menu.
Items	Displays the items in the selected list.

System Setup Tab

System Setup has these tabs:

- Telemetry
- Trace Setup
- Facility Information
- Auditing Schedule
- Startup Settings tab

Telemetry Tab Configuration

Use the **Telemetry** subtab to set the network connection information for the S2 devices. The S2 will be configured to talk to the Q-Tel tower and needs to be uniquely identified to associated it with a monitoring channel. The combination of Unit ID, Base Port, and Bed ID must be unique for a given S2 configured on the system and must match the settings in the corresponding S2 device. The Unit ID must be within the range of 1 to 99. The base port must be in a range of 10000 to 50000. The bed ID must be within the range of 0 to 99. These three numbers are combined and used as the UDP port over the WIFI communication. A maximum of 12 licensed S2 transmitters can be configured

It is recommended that you apply a label to the transmitter with the assigned Unit ID.

WARNING! Invalid patient data.

Be careful to accurately read the numbers from the transmitter and enter them correctly into the Q-Tel RMS program. Incorrect entry of the transmitter channel number will result in a failure to detect and record valid patient data.

Trace Setup Tab

Use this section to set up lead sets and the default strip recording device.

Field	Description
Lead Sets	
Lead Set	Lists the available lead sets and the priorities of the displayed leads. The system supports these ECG lead sets: **4 wire**—Four limb leads **5 wire**—Four limb leads plus one V lead (limb + C)
Priority	The system displays up to two traces for the selected lead set. Options are: **1**—Always display the traces from this lead **2**—Display the traces from this lead if space is sufficient
Lead	The name of the lead.

Field	Description
Defaults	
Lead Set	Selects the default lead set to display on the strip. You can change the lead set on a patient by patient basis, you cannot change the lead set once a patient session has begun. The gain and grid display selections can be changed during the session. To change the displayed leads, see Configuring the ECG display. When the default lead set is changed, the lead set for all patients, including those already registered in the system, are changed to the new default.
Gain	Sets the default gain.
Display Grid	The system displays the grid when there is a checkmark in the check box.
Filter Type	Select the AC line filter type appropriate to your environment: • **60 Hz** • **50 Hz** • **Off**
Chart Recorder Setup	
Recording Length	The length (in seconds) of the strip printed on the strip recorder. This setting does not affect the length of the saved strip, which is always 8 seconds. • **7** • **8** • **16** • **20**
Number of Leads to Print	Select the number of leads to print: • **1** • **2**
Paper Type	Sets the type of paper in the printer. • **Computer Printed Grid** (system default) • **Preprinted Grid**—select this option to avoid printing a grid on top of a preprinted grid
Tower	Lists each Q-Tel RMS Tower in your Q-Tel RMS network. Use Print Strips to set the printing device for the strips. If you have a standalone Q-Tel RMS Tower you will see only one entry.
Print Strips To	Sets the device where the strips are printed: • **Chart Recorder**—No longer supported • **Default Printer**—prints to the default printer attached to the system. • **Auto Detect**—the strips are printed to the default printer
Session Management	
Automatically Save Prescription on Discharge	A checkmark enables the prescription to be saved with the patient on discharge.

Facility Information Tab

Q-Tel RMS provides a number of reports and integrates with Q-Progress (Progress Tracking Assistant) and Outcomes reporting. The information entered in the Facility tab is used to provide the facility data required in some of these forms. The facility name is also printed at the top of Q-Tel RMS reports.

Field	Max Length	Description
Facility Name *	50	The name of the facility.
Address *	50 each line	The address of the facility.
City	50	The city where the facility is located.
State	--	A drop-down menu for the state or province.
Postal Code	10	The zip code of the facility.
Country	--	A drop-down menu for the country.
HCFA/CMS No.	50	Health Care Financing Administration/Center for Medicare and Medicaid Services medical claims processing number.
Phone	25	The telephone number of the facility.
Fax	25	The fax number of the facility.

Auditing Schedule Tab

Use the **Auditing Schedule** tab to manage audit tracking files.

Field	Description
Tower List	Lists each Q-Tel RMS Tower in your Q-Tel RMS network. Select the tower to expand the list of audit files.
Days to keep the audit files	A drop-down menu for the number of days to keep audit files.
AppNam	Displays the name of the Q-Tel RMS application.
AppVersion	Displays the software version of the application.
AppStatus	Displays logged activity.
Audtingtime	Displays the time of the activity.
LogUser	Displays the user name.
MachineName	Displays the name of the tower or workstation.
MachineType	Displays the type of the tower.
Clean Audit Files	Deletes the audit files older than the setting for Days to keep the audit files.

Startup Settings Tab

Use the **Startup Settings** tab to configure start-up preference for the Main and Secondary Towers only.

Field	Description
Show Startup Screen	Selects whether or not to display the selection screen upon startup. Options are: • **Yes**—display the selection screen • **No**—display the default window
Default Window	Selects the default window, if the selection screen does not display at startup. Options are: • **Patient Information** • **Session Management** • **Charting and Editing** • **Admin Reports**

Exchange Tab

The **Exchange** tab defines the settings for the Q-Exchange Export and Import settings.

Use **Export Settings** to set the default settings when exporting data.

Use **Import Data Mapping Fields** to modify the Import schema for selected fields.

Use **Automatic Import Patient Settings** to enable auto import and set frequency to check for available patients.

The following table describes each field:

NOTE: *Some displayed fields may be truncated.*

Field	Max Length	Description
Export Settings		
Session Summary PDF	--	A checkmark indicates the system exports a Session Summary by default.
Session Report PDF	--	A checkmark indicates the system exports a Session Report by default.
Full Disclosure PDF	--	A checkmark indicates the system exports Full Disclosure information by default.
Auto Export Session Data at Discharge	--	A checkmark indicates the system exports session data by default.
Combine Session Data into One File		A checkmark indicates the system consolidates the session data into one file.
Full Version of Patient Demographic Data		A checkmark indicates the system exports the full version of patient demographic data.
Q-Exchange Export Folder		Select the folder where the system exports the changes.
Browse		Use the **Browse** button to open the Windows navigation window to locate the folder.

Field	Max Length	Description
*****		
Import Data Field Mapping		
***** Existing Fields		Lists the fields expected by the Q-Tel RMS system.
****** Import Fields ******	40 each field	Enter the name of the field in the import file that maps to the **Existing Field** selection.
Automatic Import Patient Settings		
Enable Auto Import		A checkmark indicates the Main Tower system will automatically import patient files.
Import Period (Mins)		The period in minutes for the system to check for patient files to import.

Comments Library Tab

Use the **Comments Library** tab to create custom comments that can be added to the comments in the Patient Information and Session Management screens. There are sub- tabs for:

- Session Comments
- Health Assessment Comments
- Exercise Goals
- Nutrition Goals
- Education Classes

Session Comments

Use session comments to create comments for use during Session Management.

Field	Max Length	Description
Session Comment Type	--	Displays the menu of comment types.
Session Comment Names	30	The title of the comment.
Comment Name	1000	The text of the comment.

Health Assessment Comments

Use the health assessment comments to create comments for the Assessment tab.

Field	Max Length	Description
Health Assessment Comment Type	--	Displays the drop-down menu of comment types.
Health Assessment Comment Names	50	The title of the comment.
Comment Name	1000	The text of the comment.

Exercise Goals

Use the exercise goals to create goals for the patient care plan.

Field	Max Length	Description
Exercise Goal Names	50	Displays the menu of comment types.
Goal Names	500	A text field to describe the goal.

Nutrition Goals

Use the exercise goals to create goals for the patient care plan.

Field	Max Length	Description
Nutrition Goal Names	50	Displays the drop-down menu of comment types.
Goal Names	500	A text field to describe the goal.

Education Classes

Use the exercise goals to create goals for the patient care plan.

Field	Max Length	Description
Education Class Names	50	Displays the drop-down menu of comment types.
Class Names	500	A text field to describe the class.

Resource Tab

Use the **Resource** tab to maintain the lists for:

- Providers
- Insurance Carriers

If a provider or insurance carrier is assigned to a patient, the system prompts you to re- assign the patient to another provider or insurance carrier.

Field	Max Length	Description
Provider	--	Select this radio button to display the physician fields.
Provider	--	The name of the physician.
Provider ID	--	The unique identification of the physician.
Delete	--	Marks the provider for deletion.
Insurance Carrier	--	Select this radio button to display the insurance carrier fields.
Insurance Carrier	--	The name of the insurance carrier.
Delete	--	Marks the provider for deletion.

To delete a resource:

1. Select the radio button for **Provider** or **Insurance Carrier** to display the appropriate resource.
2. Double-click in the **Delete** check box for the resource. If the resource is associated with a patient, the system prompts you to assign a new resource to the affected patients:
   a. Double-click in the **Provider** or the **Insurance Carrier** field and select an option from the drop-down menu.
   b. To apply the selections, press **Enter** and then **Apply All**.
   c. Click **Save**. The system re-assigns the patient and returns to the **Resource** tab.
3. Click **Save** to delete the resource.

CPT Billing Code Tab

Use the **CPT Billing Code** tab to maintain CPT Billing Codes.

Field	Description
CPT Billing Code	The CPT Billing code.
Phase	The phase where the billing code is used.
CPT Billing Code Description	The description of the CPT Billing code.

PURGE AND ARCHIVE

This chapter describes the Purge and Archive Utility, the Archive Viewer Utility, and user controls. It describes how to purge patient data and program data for patients. It also details the difference between purging and archiving patient data.

Purge and Archive Utility

Over time your Q-Tel RMS system database and associated disk space will fill with patient data. To maintain system performance and allow for the continued storage of new patients and their session data, you must periodically purge older data from the system. You can archive this data for clinical review at a later date. The Q-Tel RMS Purge and Archive utility retains just the data you need on the system and purges older data that is not in current use. It can also archive data.

WARNING! Possible data loss.

Purging data removes information permanently. Do not purge data unless you also perform an archive, have a backup of data, or are absolutely certain you will not want the data back.

Be aware that the archive and purge operations may take a considerable amount of time, depending on the number of patients and programs you select. You cannot use the Q-Tel RMS system (either towers or workstations) while the archive and purge operations are in process.

The Q-Tel RMS Purge and Archive utility provides support for these key functions:

- Removing all records for one or more patients from the system, including their demographic profiles, all of their session parameter data, and all ECG waveform data.
- Removing all session and waveform data for one or more patients, leaving their demographic profiles on the system for possible re-use on subsequent admission.
- Purging older program data for a patient who re-entered Rehab for an additional suite of sessions. The Q-Tel RMS system retains the current in-progress session data and demographic data.
- Archiving selected data that you want to purge from the system. You can archive the data to CD-RW, external drive or to a network location. The archive includes patient demographic data, all session parameters and all PDF session reports.
  - If only the patient program, and not the patient demographic information, is selected for archive, you will get a modified header with First Name, Last Name and MRN and then the Session information. The viewer will substitute the modified header information and the full session information.
- Query the database to find out when a patient was archived and the name of the archive.

NOTE: *The Purge and Archive utility resides only on the Main Tower.*

Starting the Purge and Archive Utility

To start the Q-Tel RMS Purge and Archive utility, choose a method:

NOTE: *You must be logged into the system using an account with administrator privileges in order to run the Purge and Archive Utility. If your login account does not have administrator privileges, a message dialog will be displayed and the utility will not open.*

- Double-click the **Q-Tel RMS Purge and Archive Utility** icon on the desktop.
- Click on **Start | Quinton | Q-Tel Purge Archive Utility.**

Select Patient Information for Purge and Archive

The Q-Tel RMS Purge and Archive functionality has these tabs:

- **Patient List**—Select patient information from the pool of all patient data on the system based on the Patient Search Criteria.
- **Final Purge/Archive Patient List**—Verify that you have selected the correct list of patients for action (Purge and Archive) and to carry out the selected actions.
- **Error Information List**—Manages any error conditions that might arise over the course of the actions (error recovery).

Use the Patient Search Criteria to select patients for purge and archive. The search is based on the patient's MRN and last name. To select all of the patients you want to archive, you may need to define two or more distinct search criteria. For example, first select all patients whose program was completed last quarter and then select all patients who have not formally completed their program but have not shown-up in the past six months. Each time you specify a new criteria and search, the **Patient List** field is populated with patients meeting the criteria.

NOTE: *Patients with un-recovered sessions will not be included in the results of your search and cannot be purged or archived until the incomplete session is recovered or cancelled. See Session Recovery for information.*

To Search for	Do this…
All patients (including patients that have completed their rehab program).	1. Click the check box to select **All**. 2. Click **Search Patients**.
Patients by last name	1. Enter at least the first letter of the patient's last name in **LName.** 2. Click **Search Patients**. The search returns all patients with the associated string. For example, if you enter the letter "S", the system displays a list of all patients in the directory whose last name begins with an S. The system recognizes the wildcard characters. Enter "*" to match any number of characters or "?" to match any single character. For example: *S??th* returns Smith, Smyth, South, and any name beginning with *S*, ending with *th* and having two characters in between. *S*th* returns all the examples above and any name that starts with *S* and ends with *th*, with any number of characters in between. To narrow the search, enter more of the last name.
Patients by MRN	1. Enter at least the first character of the MRN in **MRN**. To narrow the search, enter more characters. • The system recognizes the wildcard characters. Enter "*" to match any number of characters or "?" to match any single character. For example: *S??th* returns Smith, Smyth, South, and any name beginning with *S*, ending with *th* and having two characters in between. *S*th* returns all the examples above and any name that starts with *S* and ends with *th*, with any number of characters in between. 2. Click **Search Patients**.
Select all patients within a specified time range, for example all patients for last quarter.	1. To select all patients that have completed their programs enter the date range in the **Completion Date** field. 2. To select all sessions within the date range, enter the date range in the **Last Session Date** field.
Select inactive patients (patients that will not return)	1. Specify a date range and select all patients who had their last session several months ago. • Note: Use the Ignore checkboxes to include/exclude date range criteria as part of the search.

Patient List

Use the **Patient List** to select a list of prospective patients for your review and selection. To expand or collapse the display for each patient, click on the [+] or [-] box to the left of the patient's name.

Select Patients and Programs to Purge and Archive

You can move all of the patients in the list to the Final Purge and Archive list or selectively mark patients in the list for inclusion in the final list. Continue searching for patients and moving them into the Final List until you have identified all patients for purge and archive.

To help you efficiently mark patients for purge and archive activities, use the buttons on the **Patient List** tab.

You can also manually select or de-select individual patients and specific program session data by checking or unchecking the associated box on the tree-view of all selected patients.

For patients that have completed two or more programs, you can define selection criteria that select a subset of all of the complete programs for that patient. The system prevents you from deleting the patient and the associated demographic data, leaving behind an "orphaned" program - you can only delete a patient from the system once all of the associated patient's programs have also been purged. In this scenario, if you click on the box next to a patient's name, attempting to mark the patient for deletion, but not all of the programs for that patient are complete and selectable for deletion, the system displays a warning dialog box, and prevents you from deleting the patient. The patients with both completed and active programs display with a shaded background.

> ***NOTE:*** *This dialog box is not displayed when you select the* ***Select All Patient Program*** *button. It is not efficient to show this message for all patients.*

Select all of the program nodes for a patient, and then select the patient to purge.

If a patient is in the system, then the system expects a program to be associated with the patient. When you purge all program data for a patient but leave behind the patient demographic information for possible future use, the system enrolls the patient in the default Program as defined in the Q-Tel RMS Configuration Utility. If you select the patient's final program for deletion the application displays a warning dialog box indicating that the patient will be enrolled in the default program.

Final Purge/Archive Patient List

Use the Final Purge/Archive Patient List to verify all patients to remove. You can select whether the items are purged or archived and purged.

You can archive the database information and manage the associated PDF files. You can also remove any patient or patient program that, on review, should not have been added to the processing list.

After selecting a list of patients for Purge and Archive processing, select the processing option.

WARNING! Possible data loss.

Purge and Archive processing will ALWAYS remove the selected patients and program data from the Q-Tel RMS database and delete the associated ECG waveform files.

The Archive created by the system has a standard Windows directory structure. A folder is created for each patient and the archived session and demographic data and any available PDF files are copied into each patient's folder. The archived session and patient demographic data is stored in an industry standard XML format for use by other applications, including the Q-Tel RMS Archive Viewer.

The archive created during the processing may be written to any location on the network or on the Q-Tel RMS Tower, including to a CD if available. If archiving to a CD, the CD must be blank. When a non-CD-RW drive is selected (local or network drive), click the **Open Folder** button to navigate to the folder you want to use:

When you click the **Archive** button, the program makes these validations:

- Checks the archive destination media to ensure there is enough space to hold the patients and Program data.
  - If sufficient space is available, the system displays a confirmation dialog box.
  - If sufficient disk space is not available, the system displays a warning dialog box.
- If the destination is CD-RW, the system checks if the drive has a CD in it.
- If the destination is a network drive, the system checks that the user has “Write” permission on the drive.

If any of these validations are not successful, the system does not archive the data. The system does not purge data if the associated archive is not successful.

Before starting the Archive and Purge process, designate a label name for the archive. The name should be something meaningful to the facility (for example, “Jan-March.”) The system adds a prefix of either Purge or Archive followed by mmddyyyyhhmmss.

If archiving to CD, label the CD with the name.

To cancel the purge or archive process, click the **Cancel** button.

On completion of the Archive or Purge operation, the system prompts to tune the database. Tuning the database removes overhead associated with now empty storage locations. This optimizes the Q-Tel RMS database performance. The database tuning process is very quick and is recommended.

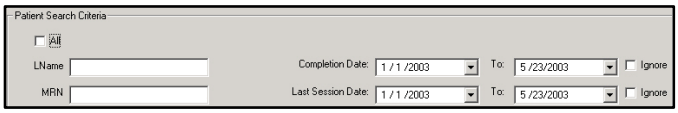
Purging Data

To permanently remove patients from the Q-Tel RMS system:

> ***NOTE:*** *The purge process can take up to 2 minutes per patient. Do not purge more than 10 patients at one time*

1. Double-click the **Purge/Archive Utility** icon on the desktop.
2. Select the **Purge** option.
3. Select the files you want to purge. Generate a list of patients by clicking the **All** check box and then **Search Patients** to list all patients on the system.

   You can also list specific patients by MRN, last name, completion date, or last session date. Enter the conditions and click **Search Patients**. A list of patients that meet your criteria displays.



4. Click the check box for each patient and/or program you want to purge or click the **Select All** box to select all patients in the list.

5. Click the Add to Final Purge/Archive List button.

   The system displays the selected patients. Review the list to ensure that only those patients to be removed from the system are listed.

6. Click **Purge**. A message confirmation dialog box displays.
7. Click **Yes** to continue or **No** to cancel. The system prompts for a batch name for this purge.
8. Click **OK** to use the default name. When the process is complete, the system prompts you to tune the database.
9. Click **Yes**. When the hourglass displays as the regular cursor tuning is complete.

Archiving Data

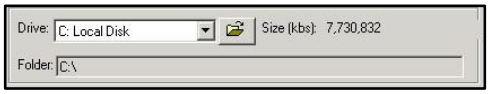
To archive patients (and permanently remove them from the Q-Tel RMS database):

> ***NOTE:*** *The archive process can take up to 2 minutes per patient. Do not archive more than 10 patients at one time.*

1. Click the **Purge/Archive Utility** icon on the desktop.
2. Click **Archive** under Data Processing Options.

> ***NOTE:*** *Selected patients are purged after archiving.*

3. Select the files you want to archive. Generate a list of patients by clicking the **All** check box and then **Search Patients** to list all patients on the system. Alternatively, specify patients by MRN, last name, completion date, or last session date. Enter the conditions and click **Search Patients**. A list of patients that meet your criteria display.
4. Click the check box in front of each patient and/or program you want to archive or click the **Select All** box to select the entire list.
5. **Click** Add to Final Purge/Archive List**.** The system displays the selected patients. Review the list to ensure that only those patients to be removed from the system are listed.
6. Click the down arrow by the drive selection. A list of available drives displays. Click on the drive where you want to archive the files.



7. Click **Archive**. A confirmation dialog box indicates these files will be deleted from the server.
8. Click **Yes** to proceed or **No** to cancel. A dialog box displays indicating the archive may result in a long wait time.
9. Click **Yes** to proceed or **No** to cancel. A dialog box displays indicating the estimated number of MB needed to write the archive.
10. Click **OK** to proceed with the archive.
11. The system prompts for the archive name, click **OK** to use the default name. When the archive completes, the system prompts you to tune the database.
12. Click **Yes**. When the tuning is complete, the hourglass displays as the regular cursor.

> ***NOTE:*** *Although you can view archived patient data with the Q-Tel RMS Archive Viewer, you cannot restore a patient from archive back to the Q-Tel RMS system.*

Error Information List Tab

Use the **Error Information List** tab to retry the processing of Archive and Purge data. If an error occurred during the archive or purge process, the application lists the patients and/or patient programs on the **Error Information List** tab.

Patient data is not purged from the system if an error occurs during processing.

If you highlight either the patient or patient program node, the error message text displays in the bottom left of the form.

To resolve an error:

- To re-try the failed records, click the **ReTry All Checked** button, or click the **Cancel** button to ignore the failure on the records and finish the batch purge and archive processing. Before clicking **ReTry All Checked**, you can ignore individual patients or programs by unchecking those items.
- If an error occurs during the purge or archive process, click the **Cancel** button to rollback the archived data file in the error list.

Field	Max Length	Description
Patient Search Criteria		
All	--	A checkmark indicates that all patients are listed for purge and archive.
LName	50	A portion of the patient's last name. The system uses this information to search for the patient. The system recognizes the wildcard characters. Enter "*" to match any number of characters or "?" to match any single character. For example: *S??th* returns Smith, Smyth, South, and any name beginning with *S*, ending with *th* and having two characters in between. *S*th* returns all the examples above and any name that starts with *S* and ends with *th*, with any number of characters in between.
MRN	40	A portion of the patient's MRN. The system searches for patients with an MRN that begins with the entered characters. The search returns all patients with the associated string.
Completion Date	--	A drop-down menu displays a calendar for selecting the date range.
Last Session Date	--	A drop-down menu displays a calendar for selecting the date range.
Data Processing		
Options Archive	--	Directs the system to write the patient's demographic and session data to the archive file. The archive file includes all previously created PDF files for the patient. On completion of the Archive operation, the system automatically performs the Purge operation on the selected patient data. Click on the radio button to select the **Archive** option.
Purge	--	Deletes all selected patient data *without* saving or archiving.

Field	Max Length	Description
Remove PDF Files	--	Deletes the associated patient report PDF files from the Q-Tel RMS system. When you choose the **Remove PDF Files** option during a Purge or Archive, all PDF files associated with the selected patients are deleted regardless of the programs selected for the operation. Do not select the **Remove PDF Files** option unless you are selecting the patient, not just the program(s), for Purge or Archive. The session PDF files support viewing of ECG strips, as well as the session data (see *Session Management* for more discussion on the session PDF capabilities). ECG strips for the selected patients being Purged are viewable ONLY via the PDF files. If future viewing of the ECG strips is important then it is recommended that PDF session reports routinely be generated for each patient and the Archive function always be selected during Purge/Archive operations.
Search Patients		Creates a patient list of all patients meeting the search criteria.
Drive	--	A drop-down menu displays the network locations for Archive storage.
Folder	--	Displays the folder location for Archive storage.
 **Open Folder**	--	Displays a dialog box to navigate to the Archive folder. Displays the size of the folder in kbs.
Patient List Tab		
Select All	--	Selects all demographic and session data for the patient.
Select All Patient Programs	--	Selects all patient programs (all session data) but does not select patient demographic data.
Select Completed Patient Programs		Selects only those patient programs that have been completed and leaves patient demographic and active patient program session data.
Clear All	--	Removes all patients and their associated patient program nodes from the patient list.
Patient Name	--	Name of the patient.
MRN	--	Patient's MRN>
Complete Date	--	The date the session was complete.
Session Date	--	The date of the last session.
Number of Sessions	--	The number of sessions completed for this patient.
>>	--	Adds the selected programs and patients to the **Final Purge/Archive Patient List**. You can switch back to the **Patient List** tab to select more patients or patient programs and add them to the **Final Purge/Archive Patient List** as many times as necessary.
Final Purge and Archive Patient List Tab		
Remove Unchecked Patients	--	Removes all patients that you have unchecked from the **Final Purge/Archive Patient List.**
Remove All	--	Removes all patients and patient programs from the **Final Purge/Archive Patient List.**

Field	Max Length	Description
Estimate Space Required	--	Perform an analysis of the space required to archive the selected items. The system displays a dialog box with the information.
Archive Purge	--	The system labels the button according to the Data Processing Option selected. Clicking the button begins the purge or archive process.
Error Information List Tab		
Select All	--	Check all items.
Select Patient Programs	--	Check all patient programs.
Retry All Checked	--	Resubmit the checked items for purge or archive.
Cancel	--	Cancels the purge or archive for these items.

Purge and Archive Utility Tools

Purge and Archive provides tools that can be run either from the Toolbar button or by selecting them from the **Tools** menu:

- Purge/Archive Batch List
- Tune Database

You can run both utilities functions at any time without purging or archiving data.

Purge/Archive Batch List

The Purge/Archive Batch List function queries the Q-Tel RMS database to determine how many archives have been performed and lists them to past Purge or Archive activities. The archive label name is displayed for each previous archive. Click on an archive to expand the list and display the list of all patients associated with the selected archive. If you are writing the archive to a CD, this utility can help you find the right CD to load for viewing the patient of interest.

Tune Database

After purging data from the database, the system may have needless overhead associated with now empty storage locations. The Tune Database function optimizes the database for performance. To run the performance tuning just select the option from the Tools menu or click on the icon at the top left of the screen.

Archive Viewer Utility

The Q-Tel RMS Archive Viewer supports retrieving, viewing, saving as PDF files, and printing of patient demographic and session information previously archived using the Q-Tel RMS Purge and Archive utility. The Archive Viewer supports archive data stored on the local hard drive, a CD-ROM, external USB hard drive, a USB portable flash memory disk, or a hard drive on a remote system.

> ***NOTE:*** *You can use the Archive Viewer from the Main Tower, Secondary Tower or Workstation, as long as the storage location is accessible. If the archive folder is on a remote machine, ensure the archive folder is shared and assigned access privileges to the user account for the other Q-Tel RMS machines; and create a map from the other Q-Tel RMS machines to the shared folder.*

Starting the Archive Viewer

To start the Q-Tel RMS Purge and Archive utility, choose a method:

- Double-click the **Q-Tel Archive Viewer** icon on the desktop.
- **Click on** Start | Quinton | Q-Tel Archive Viewer.

Search Archive Batch Info

To retrieve and view archived patient information identify the archive and select the patient.

To identify the archive and select the patient:

1. Start the Archive Viewer.
2. Click the **Search Archive Batch Info** tab on the Archive Viewer, to navigate to the correct archive and patient.
3. Click the **Select Archive Folder** button to find the archive. The Select Archive Folder window displays. The **OK** button is grayed-out (disabled) until you double-click on a folder that contains archive data files.
4. Select the drive (local, network or CD) and select folder that contain archive data. If the folder contains Q-Tel RMS archive data, the **OK** button becomes active. To locate a particular archive, view the Purge/Archive Batch List in the Q-Tel RMS Purge and Archive utility to see which patient was archived to which archive directory or CD.
5. Click **OK** to load the names of the patients, and their archived programs, into the **Search Archive Batch Info** screen.

Selecting Patient Data to Display

Expand the **Search Archive Batch Info** screen display to display the Program(s) associated with each patient. For example, one patient may have returned to Rehab for a second Phase II Program, or may have both Phase II and Phase III programs stored in the archive. You can expand or collapse the display for each patient by clicking on the [+] or [-] box to the left of the patient's name.

For large archives use the **Find Patients** button to find a patient in the archive list. To find a patient:

1. Enter either the patient's last name (or any portion) or an MRN in the text box to the right of the **Find Patients** button.
2. Select either **By Lname** or **By MRN** as appropriate for your search. The program moves the cursor to the first patient record that satisfies the search requirements.

Display Archive Data

Only one of the archived patient demographics and session information files can be viewed at a time. To view the data, select one of these options:

- Double-click the name of the selected patient—the patient and the first program for that patient displays.
- Click on the patient name (highlights), then click on the **Show Patient and Session Data** tab—the patient and the first program is displays.
- Click the patient node (expands list to see all programs associated with this patient), then select a program other than that patient's first one. Click the **Show Patient and Session Data** tab—the patient and the selected program displays.
- Click the patient node (expands list to see all programs associated with this patient), then double-click the program of interest—the patient and the selected program displays.

Show Patient and Session Data

The **Show Patient and Session Data** tab displays the patient demographic and session information associated with the selections made above

User Controls

Function	Definition
Scrolling	Use the scroll bar at the right to scroll the window up and down through the current page.
Paging	To see a specific page of the display, click the Left or the Right arrow button or type the page number in **Page** box and click the **Go** button.
Zoom	Use the **Zoom** menu to expand or contract the display.
Print	Click the **Print** button to print the entire archived report
Save	Click the **Save** button to save the display as a PDF file. You may save the file in any network location or local folder. Saving the patient information as a PDF file is an easy way to create an electronic document that you can attach to an e-mail.

NETWORK OPERATION AND WORKSTATION CAPABILITIES

This chapter describes configuring the workstation for the network option.

> ***NOTE:*** *Wireless devices, by nature, cannot guarantee uninterrupted connectivity due to unforeseen and unpredictable interference from other radio frequency sources. The Q-Tel RMS system uses a variety of methods to mitigate outside interference and accommodate co-existence with other wireless systems. Users are responsible to identify potential nearby sources of radio frequency interference and take appropriate measures to minimize interference.*

Network Operation

Q-Tel network capabilities leverage a common database of patient information across multiple networked Q-Tel RMS Towers and Workstations. This supports many functions important for efficient operation of a large rehabilitation center allowing you to:

- Access and update Patient Information, Session Data and Administrative Reports from multiple locations, including your office workstation.
- Admit patients to sessions from any tower.
- Selectively monitor patients, manage sessions and enter data from multiple workstations located throughout the facility.

A Q-Tel RMS Tower is a computer system that receives ECG signals from the transmitters worn by the patients. Patients must be admitted to sessions on towers. A Q-Tel RMS Workstation is a computer that does not receive the ECG signals. You can connect any combination of up to four towers and workstations on your network.

WARNING! Possible improper system behavior.

Exceeding the four node/machine limit on your Q-Tel RMS network can cause unpredictable and unstable behavior.

WARNING! Possible Improper Use.

Workstations are not intended for monitoring alarms.

Anti-Virus Software

The use of Norton anti-virus (AV) software or McAfee AV software that has been tested for compatibility is recommended for the computers hosting the Q-Tel RMS applications. The following guidelines apply in the use of AV software;

- Customer is responsible for installation and maintenance of AV software
- AV software updates (software and definition files) should not be applied during active use of the Q-Tel RMS application
- AV software must be configured to exclude files/folders as defined in the Q-Tel RMS Installation Manual
- Active scanning is allowed during operation of the Q-Tel RMS application

Please refer to the instructions included with your anti-virus software for complete configuration instructions.

WARNING! Computer virus protection.

- If you allow active scanning during the operation of the Q-Tel RMS application and exclusions are not configured per instructions in the Q-Tel RMS Installation Manual; you may notice performance degradation during operation of the product.
- If you have a technical support issue on your Q-Tel RMS system, you may be asked to remove any virus scanning software from the device to allow investigation of the issue.

Accessing Patient Data on the Network (Locking)

On a Q-Tel Network, multiple concurrent Q-Tel RMS Tower and Workstation users can access and update potentially the same patient information at the same time. This could lead to confusion and uncertainty as the system attempts to reconcile which changes should be kept and which overwritten.

Locking a Record

To prevent confusion, Q-Tel RMS controls or *Locks* a record when it is in use and notifies users of the status if they attempt to access and change the same information. A view-only capability ensures key information is always available to every user (for example: emergency contact information), even when the record is locked by another user.

To minimize the likelihood that a user will encounter a locked record, the patient data is divided into workflow areas:

Icon	Definition
	Patient Info
	Session Management
	Charting and Editing

For example, one user may be in an office updating the Patient Information for a patient, that patient can also be participating in an active session in the rehab area and currently monitored by a technician using the Session Management section, at the same time, another colleague using a different workstation might be updating past session information in Charting and Editing. The following sections discuss more of the details regarding network use of Q-Tel RMS and lock management.

Locking with the Rx Feature

The Q-Tel RMS Network prevents multiple users from changing the exercise prescription for the same patient. For example, if a workstation user accesses the **Rx** tab in Patient Information, then other users cannot edit or change the Rx for the same patient using the Rx tools in Session Management or Charting and Editing.

With either the Q-Tel RMS Tower or Workstation you can always make changes to the current prescription in Session Management for the current session. You cannot save that prescription for future sessions unless you have control (system focus). When the **Save Rx** button is enabled you have control. When the **Save Rx** button is not enabled (grayed out), you do not have control.

Additional Features in Patient Information

Refresh List

When any user enters a patient into the database, other users can access that patient.

To access a new patient:

- From the **Patient Search** tab, click the **Refresh List** button. If the **Refresh List** button is enabled (not grayed-out), then there are new patients entered that are not on your current list. The system updates your list adding the newly entered patients.
    - When you enter a new patient on your own computer, the **Refresh List** button is not enabled because the patient is available on your list immediately.
    - The **Refresh List** button is on the **Patient Search** tab in **Patient Information**, **Admit** tab in **Session Management**, and the **Add to Queue** Tab in **Charting and Editing**.
    - The **Refresh List** button can create a slight delay on the modality clock in Session Management. Click **Refresh List** only after all patients are dismissed from active sessions.

Patient Locking

In Patient Information, if you attempt to open a Patient Information record for a patient who is already opened in Patient Information on another station, a dialog box indicates the Patient Information is available as read only and indicates the workstation or tower where the record is open.

When you have completed making your additions and edits in Patient Information for a specific patient it is courteous to other users to release the record so that others can access and update the same record as necessary.

To release a record, choose a method:

- Select the next patient in your work list.
- Select **Close Patient** on the **Patient Search** tab.
- Double-click on another patient in the **Patient Search** screen.

For more information on patient locking see *Accessing Patient Data on the Network (Locking)*.

Workstations

This section describes the network considerations for a Workstation. Workstation software can be installed on customer supplied hardware or come pre-configured from Welch Allyn as a Turnkey Workstation.

WARNING! Alarms not real time.

Waveforms and alarms on the Workstation are near real-time but are NOT real-time.

WARNING! Alarm volumes.

Network system failures may disable the display of ECG waveforms and visual alarms on network connected Workstations. Alarm volumes should be set sufficiently loud on the Q-Tel RMS Tower to be heard adequately throughout the entire rehab facility. ECG waveforms displayed on the Workstation that are not being updated should not be relied upon for current patient status.

Caution: Network failure.
The Q-Tel RMS system monitors network connections and notifies the user via a message window if a network failure is detected. Workstations connected to Q-Tel RMS Towers via the failed network are not functional. The system network should be checked, and any dislodged network plugs, power-down conditions or other failures corrected. Reestablishment of the network connection within a few minutes of the failure will allow activities in Patient Info and Charting and Editing to continue without shutting down and restarting the Q-Tel RMS software on the Workstation.

Workstation Capabilities

Q-Tel RMS Workstations function the same as a Q-Tel RMS Tower except:

- Workstations do not show ECG trace data in true real-time. The display may be slightly delayed by network traffic. Workstation users can request that an ECG strip be recorded and printed. These requests are executed on the associated Q-Tel RMS Tower that was used to admit the patient. The strip is positioned in the same manner as an ECG strip requested from a Q-Tel RMS Tower. However, it can be slightly delayed from when the user clicked the **Save** or **Print** buttons on this workstation because of the delays associated with network traffic.
- You cannot access or change the ECG arrhythmia detection controls (for example, put a patient in Standby, or enter Learn). You must access these activities on the tower that admitted the patient.
- You cannot change the ECG waveform display parameters. These must be accessed and changed on the Q-Tel RMS Tower that admitted the patient.
- You cannot admit a patient to a new session on a Workstation. You can, however, take control of the session after the patient is admitted on a Tower.
- You cannot view Full Disclosure data for monitoring sessions that are in progress.

Review Workstations

Review Workstations are Workstations without the Session Management license. On Review Workstations, Session Management functionality is read-only. You can view ECG waveforms in non-real time as well as all session information, but you cannot edit any information in Session Management. This limitation is useful for Workstations installed outside the rehab center where clinicians can't physically see the patients they are editing.

You can display selected patient ECG waveforms on remote workstations (as well as on the admitting tower) and enter session data at the most convenient computer - either tower or Workstation. This leads to an environment where it is common for multiple users to be concurrently accessing and updating session data for the same patient at multiple locations in the facility. To prevent confusion is it important to maintain the concept of locking a patient record during edits. But, it is also important to quickly release the lock so that other users can also access and update the same patient session data. Provided no one else is currently accessing the same patient, you will automatically be given a lock on a patient session record when you double-click the patient's ECG tile.

You can also acquire a lock (take control of the patient data) on a tower by clicking the **Unlock** button  at the bottom left of the session data grid and on Workstations by clicking the **Take Control** button. When you quit entering information the lock automatically expires in 15 seconds and any other user can then access and edit the same patient session data. This 15-second delay allows you sufficient time to review your edits and continue making changes and updates without losing control to another user, but short enough so that other users will rarely encounter a locked record. You don't need to do anything to create the lock — it happens automatically for you when you double-click on the tile. Should you attempt to access session data for a patient that is being updated by another user the locked dialog box displays.

You can always print and save strips even if the session data is locked and being edited by someone else.

Connecting to the Q-Tel Network

Q-Tel RMS Workstation Software can connect directly on the Q-Tel RMS network, or via the hospital network allowing you access to all data and sessions.

It is recommended to disable screen savers prior to using the Q-Tel RMS Workstation application.

If you install the Workstation software on a domain member machine, you may need to configure the machine as described in the Q-Tel RMS System Installation Guide.

Patient Selection

Patient selection on the Workstation is similar to that on the Tower but has some very important distinctions. Patients can only be admitted on a Q-Tel RMS Tower that has the necessary telemetry electronics for receiving and processing the ECG data.

The Workstation patient session list shows all patients (monitored and non-monitored) admitted to a session on all Towers connected to the network. The Workstations are provided with information on all patients currently admitted on all Towers. You can select from this list the patients to be accessed and displayed on the Workstation. The displayed patient list provides you with current information about each patient, including the current exercise modality, heart rate and blood pressure.

If the **Refresh List** button is active, click on it to add patients to the list who have been admitted since you last refreshed the list.

Each workstation can display up to 18 ECG tiles.

The patient queue on the workstation is the same as that on a tower except for the last four columns.

All patients are initially displayed in gray. The following table shows how to activate the patient (the patient information turns black).

Definition	Workstation	Review Workstation
Double-click on the patient name and go to the session tab.	X	X
Double-click on the ECG column for that patient.	X	X
Double-click on the Take Control column for that patient.	X	

Take Control is not selectable with a Review Stations as all Session Management functionality is read-only.

Icon	Label	Definition
	**View ECG**	Check this column to view near real-time ECGs for the patient during an exercise session.
	**Take Control** (Turnkey Workstation only)	Check this column to take control (lock) of a patient currently admitted to a session on one of the other towers (clicking on **Take Control** also activates **View ECG**). Once an ECG tile displays, you can also take control of a patient by double-clicking on the patient ECG tile.
	**Monitored Non-Monitored**	Patients who are admitted to a session as non- monitored will not have a computer icon showing in this column.
	**Discharged Not Active**	If a patient has been discharged or is no longer in an active session, this column is checked.

All information added to a patient's active session is reflected on the other station(s) that are viewing the tab that is being updated. For example, if the Turnkey Workstation has control of the patient's active session and the technician adds blood pressure information, the data displays on the admitting Tower. If the patient alarms with VTACH, this alarm shows on all stations where this patient is currently listed.

Remove a Patient from the Patient Session List

When a patient is discharged from the controlling station, that patient is also discharged from any other station list.

To remove a patient from the Workstation, choose a method:

- Click the **Refresh List** button when a checkmark displays in the **Discharge/Not Active** column.
- Double-click the red checkmark in the **Discharged/Not Active** column.

Discharge from the Workstation

If you have taken control of a patient and discharge that patient from a Workstation, you have one more option on the **Discharge** tab.

Under the **Queue for charting and editing**, another selection displays: **Queue to this machine**. If you check only the **Queue for charting and editing**, the patient is queued to the admitting Tower. If you check both boxes, the patient is queued for charting and editing to this Workstation.

Additional Features in Charting and Editing

The locking in Charting and Editing is the same as for the **Patient Information** tab. See *Accessing Patient Data on the Network (Locking)* for further information.

If another user is updating a patient's session data in **Charting and Editing** you can still view, but not edit, the same patient's past session data. In the **Full Disclosure** tab, you can access these functions:

- Change the View
- Show the list of stored strips
- Show the list of alarms
- Print a full disclosure report

These functions in the full disclosure tab are disabled when the patient is read-only.

- Zoom/Center selected strip
- Record selected strip
- Add new strip
- Display setting
- Restore deleted strips
- Delete selected strips

To remove a patient from the Charting and Editing queue, click on the box in front of the patient name and click the **Remove from Queue** button on the Add Queue tab.

Network Errors

This section describes how network failures affect the networked Q-Tel RMS system.

WARNING! Monitor network status.

Users should monitor network status and take immediate corrective action when the Network Down notification window appears. Please review details in this section for troubleshooting network issues. If network connectivity is not restored within 5 minutes, data loss may occur. Please refer to the section on Session Recovery to attempt recovery of data lost during network issues.

Q-Tel RMS Workstation Network Issue

To troubleshoot Workstation network issues:

- When you click to initiate an action on the Q-Tel RMS Workstation application and the system has a network issue, the system displays a warning dialog box.

  If you click **Retry** and your Q-Tel RMS network connection is successfully re-established the system displays a restart message. After network connectivity has been restored, you will have full functionality in Patient Information and Charting and Editing, but in order to regain functionality in Session Management you must restart the Workstation.

  If you click **Cancel**, the Q-Tel RMS Workstation application closes.

- If you do not act when your Q-Tel RMS Workstation has a network issue, it will detect the issue within 10 seconds and display a restart message. After network connectivity has been restored, you will have full functionality in Patient Information and Charting and Editing, but in order to regain functionality in Session Management you must restart the workstation.

- If your Workstation experiences a network issue and you have not taken action or are unable to correct the Q-Tel RMS network issue within 5 minutes the system displays a warning dialog box.

Q-Tel RMS Secondary Tower Network **Issue**

To troubleshoot the Secondary Tower:

- If you have a network issue, the system displays a warning dialog box when you click to initiate an action on the Q-Tel RMS Secondary Tower.

  If you click **Retry** and your Q-Tel RMS network connection is successfully re-established, you can continue as normal and have full functionality in Patient Information, Charting and Editing and Session Management. You will lose Session Management functionality on your Q-Tel RMS Workstations until you shut down and restart your Q-Tel RMS Secondary Tower(s) and then restart your Q-Tel RMS Workstation(s).

- If your Q-Tel RMS Secondary Tower experiences a network issue and you have not taken action or are unable to correct the Q-Tel RMS network issue within 5 minutes the Q-Tel RMS Secondary Tower displays a warning dialog box.

  If you click **Cancel**, the Q-Tel RMS Tower application closes.

Q-Tel RMS Main Tower Network Issue

If you experience a network issue, your Q-Tel RMS Main Tower functions normally in all areas, including Patient information, Charting and Editing, and Session Management. However, Q-Tel RMS Secondary Towers and Q-Tel RMS Workstations will lose connectivity to the Q-Tel RMS database on the Main Tower and will not be able to execute any functions until the Q-Tel RMS network issue is corrected.

You must correct the Q-Tel RMS Network issue within 5 minutes in order to re-establish functionality for your Q-Tel RMS Secondary Towers or Q-Tel RMS Workstations.

If you do not correct the Q-Tel RMS network issue within 5 minutes, your Q-Tel RMS Secondary Towers and Q-Tel RMS Workstations need to be restarted.

After you correct your Q-Tel RMS network issue, restart your Q-Tel RMS Secondary Towers and Q-Tel RMS Workstations, full functionality will be restored.

TROUBLESHOOTING

This chapter describes how to troubleshoot or resolve software and hardware issues that may affect the Q-Tel RMS.

WARNING! Contact Technical Support.

If at any time you suspect your Q-Tel RMS system is not working properly, immediately contact Technical Support. See *Contact information*.

Software: Diagnostic/Service Programs and Procedures

View the log file using a text editor such as Microsoft Notepad. At the beginning of the log file is a line of information about the log itself.

```
<QuintonErrorLog Version="1.1" StartTime="12/27/01 08:23:41">
```

The following table describes the standard log entries. Not all contents indicate error. Some messages contain informational data.

Sample Log Entry	Explanation
<QuintonEvent>	Begin logged event.
<QuintonEvent version="1.0" Forwarded="n" Count="1" RawTime="1009470402" Type="11" Severity="105" ContextID="1200" hResult="800A0BCD">	Information about the version, number of times the event was detected, type, severity and context of the event.
<Date>Thu Dec 27 08:26:42 2001</Date>	Date and time in human format.
<Guid>{5CFF4640-ACC6-11D3-8F63-0000C0282FFD}</Guid>	ID of the object (if any).
<MachineName>Q-Tel</MachineName>	Machine where the log file is written.
<Message>Test started</Message>	Message text for the log entry.
<Location>CBOBase::GetVal(Long)</Location>	Code module and function where the error occurred.
<LineNumber>1394</LineNumber>	Line number in that module/function.
<UserName>Administrator</UserName>	Logged-in user.
<Data>0</Data>	Any data associated with the event.
</QuintonEvent>	End of event.

Laser Printer

Use this section to troubleshoot the laser printer.

Troubleshooting

In the event of a printer problem, consult the user guide that came with the printer.

Transmitter Troubleshooting

WARNING! Contact Technical Support.

If at any time you suspect your Q-Tel RMS system is not working properly, immediately contact Technical Support. See *Contact information*.

S2 WIFI Transmitter Troubleshooting:

Refer to the 95115-210-50-ENG S2 User manual for troubleshooting instructions.

Speakers

Use the following table to troubleshoot the Q-Tel RMS speakers.

Symptom	Possible Cause	Resolution
No Alarm Sound	Power cord is not plugged into the power strip.	Verify power cord is firmly plugged into power strip.
	The Speaker cord is not plugged into the PC.	Verify that the speaker cord is firmly plugged into the PC.
	Volume on the speaker is turned down.	Check that the speaker volume is at the correct level.
	Windows volume is turned down.	Check the sound volume in the Windows control panel.

Error Messages

The errors in the following table refer to messages generated by the Q-Tel RMS application rather than those that are generated by the Microsoft operating system. If the given remedies for these errors are ineffective, contact Technical Support. See *Contact information*.

#	Error Message	Resolution
411	Warning, an unexpected error has occurred while saving data. Continuing to run the application in this state can result in unexpected behavior and/or loss of data. Click OK to continue without saving or Cancel to attempt to resolve the problem.	Select **OK** to discard your input. Select **Cancel** to return to the data fields to change your input. If you continue to receive this message, restart the Q-Tel RMS application.
465	There is a problem with alarm manager.	Call Technical Support.
466	We are unable to create all our components.	Call Technical Support.
467	The transmitter setup has a problem.	Use the Configuration utility to view your transmitter setup. Check that the transmitters for your system are configured properly.
468	The default alarm setup has a problem.	Use the Configuration utility to view the default alarm setup. Verify all alarm settings.
469	Event Manager was unable to start.	Reboot the computer.
470	Report Manager could not start. You will not be able to run reports.	Call Technical Support.
471	Chart Manager could not start. You will not be able to print chart strips.	Call Technical Support.
727	You must discharge your patients before closing.	The Q-Tel RMS application cannot be closed if patients are being monitored. Discharge the patients and then close the application.
906	Audible Alarm Error. An error occurred that prevented an audible alarm from sounding.	Call Technical Support.
912	Alarm Error. An error occurred that can result in unreliable alarm indications.	Call Technical Support.
1016	Q-Tel RMS requires a minimum screen resolution of [1920 x 1080]. The current screen resolution is [#### x ####].	Go to the Windows **Control Panel** and under **Display Settings**, set the **Screen Resolution** to a resolution equal to or higher than **1920 x 1080**.
1460	You may need to adjust the alarm volume. Select OK to retest the alarm volume or Cancel to run Q-Tel RMS with Session Management disabled.	If you responded **No** to the alarm volume test dialog when you started the Q-Tel RMS application, this error message displays. Check the speaker connector and volume.
1551	The SQL DTC (Distributed Transaction Coordinator) service is not running.	Call Technical Support.
1552	There is not enough file space available.	Your system is running low on disk space. Delete temp files and defrag the hard disk as described in Q-Tel RMS Tower Hard Drive Space Maintenance.
1553	There is not enough file space available to admit any more patients.	Your system is running on disk space. Delete temp files and defrag the hard disk as described in Q-Tel RMS Tower Hard Drive Space Maintenance.
1554	The Q-Tel RMS database is ##% full and is almost out of space.	Perform the Purge/Archive function to free up space in your database.

#	Error Message	Resolution
1556	The Q-Tel RMS is in an unknown state and cannot run. Please call Technical Support for assistance.	Call Technical Support.
1557	There is only enough file space available to run fewer than one hundred one-hour sessions.	Your system is running low on disk space. Delete temp files and defrag the hard disk as described in Q-Tel RMS Tower Hard Drive Space Maintenance.
1558	The system has detected that you started the Q-Tel RMS application yesterday. Before you can admit another patient you must shut down and restart the application.	Exit the Q-Tel RMS application and then restart it.

Network Errors

#	Error Message	Resolution
1909 1910	Network connection to Q-Tel RMS Server is down.	Click **Cancel** to shut down the application. Click **Retry** to continue after you have corrected your Q-Tel RMS network issue. Make sure that all Q-Tel RMS System network cables are plugged in securely to the Q-Tel Machines and switches. Check your machine's System log and verify there are no entries related to your network card.
1910 1911 1912	Session Management function is not available due to network connection problem. You need to restart RMS application on Secondary Tower(s).	Ensure that Q-Tel RMS System network cables are plugged in securely to the Q-Tel machines and switches. Restart Q-Tel RMS towers and Workstations to regain full functionality.
1903 1908	Session Management function is not available due to network connection problem. You need to restart your Q-Tel RMS Workstation.	Ensure that Q-Tel RMS System network cables are plugged in securely to the Q-Tel machines and switches. Restart Q-Tel RMS Workstation to regain full functionality.
1905	This computer has lost the connection to the network for more than 5 minutes. You cannot run the Q-Tel RMS application on this computer until the network connection has been re-established and the application has been restarted. The Q-Tel RMS application will exit when you click the Close button	Make sure that all of your Q-Tel RMS Systems Network cables are securely plugged into the Q-Tel RMS machines and switch. Click the **Close** button to shut down the application. Correct the Q-Tel RMS Network issues then restart your Q-Tel RMS Secondary Tower(s) and Q-Tel RMS Workstation(s).

Configuration Errors

#	Error Message	Resolution
800	Warning - [Application you are trying to start] and [application already running] cannot be run at the same time. Please shut down [application already running] before running [Application you are trying to start].	Q-Tel RMS, Configuration, Backup Restore, and Q-Progress cannot be run concurrently. To switch to another Q-Tel application, close the current application before trying to open another.
	DICOM Service was disabled and is enabled on this computer now. The application will terminate. Please reboot the machine to take effect of the set.	The Q-Tel applications require DICOM to be enabled. If DICOM is disabled, the system detects the error and enables DICOM. You must reboot the system for the change to take effect.

MAINTENANCE

Keep system components clean. Perform preventive maintenance as needed and at least semi-annually.

Care and General Cleaning

This section describes the procedures for cleaning and care of the Q-Tel RMS system.

WARNING! Risk of electric shock.

Dangerous voltages are present in the power supplies and around the power connections when the Q-Tel RMS system is powered up. Verify that all power cords are disconnected from the wall outlet before performing maintenance procedures.

General Cleaning Safety Precautions

- Never use solvents or flammable solutions to clean the computer.
- Never immerse any parts in water or cleaning solutions; apply any liquids to a clean cloth and then use the cloth on the component.
- Always unplug the computer before cleaning the keyboard, mouse, or air vents.
- Disconnect the keyboard before cleaning it.

Caution: Possible equipment damage. Do not leave excess fluid on the unit. After cleaning, always wipe the unit dry with a clean, lint-free cloth.

Caution: Possible equipment damage. Static electricity can damage electrical components.

Component	Action	Schedule
Monitor glass	Wipe the monitor screen with a towelette designed for cleaning monitors or with a clean cloth moistened with water.	As needed
Keyboard	Use plain water with a clean, lint-free cloth or swab to clean the top of the keys.	As needed
Computer case and monitor case	Use plain water with a clean, lint-free cloth or swab. Clean the air vents to prevent lint and foreign material from blocking the airflow. Only use an ESD rated vacuum or compressed air near the PC.	As needed

Refer to the Q-Tel RMS Service Manual, part number 8025608, for detailed cleaning and maintenance instructions.

Transmitter Cleaning and Maintenance

Refer to the Welch Allyn S2 Transmitter User Manual, 9515-210-50-ENG for device maintenance instructions.

Disposal of Waste Materials

Refer to the Welch Allyn S2 Transmitter User Manual, 9515-210-50-ENG for instructions on battery and electrode disposal.

Inspection

After maintenance on a Q-Tel RMS system, inspect cables and wire harnesses for frayed insulation, excessive bends or crimps, burned terminals, and other signs of wear.

Q-Tel RMS Tower Hard Drive Space Maintenance

As you use your Q-Tel RMS system, temporary files are created on the hard drive in the system temp folder. These temporary files can use excessive amounts of hard drive space. Delete these files and improve system performance.

Delete Temp Files

To delete temporary files:

1. Make sure all applications are closed.
2. Log into the system with any account.
3. Click the Start button.
4. In the Search field type **%temp%.**
5. Double-click the folder named **QTel User** or the user account you normally are logged in with when using your Q-Tel RMS system. Click the **Temp** folder at the top of the results window.
6. Hold the **Ctrl** key and press **A** to select all files.
7. Hit the Delete key on your keyboard.
8. Select **Yes** at the Delete Multiple Items confirmation window.
9. Choose **Skip** for any items that you are alerted cannot be deleted at this time.
10. Close the Temp folder window.
11. If needed, repeat steps 2 – 10 using a different account.

Defragment Hard Disk

Over time performance on the hard drives degrades because of file fragmentation. This is a normal process on machines that run the Microsoft Windows operating system and can be avoided by periodically performing the disk defragmentation function. On Q-Tel RMS machines, it is recommended to perform disk defragmentation at least once a month for each installed hard drive.

To defragment a hard drive on your computer:

1. Double-click **Computer** from the desktop.
2. Right-click on the drive you want to defrag.
3. Select **Properties** from the drop-down menu.
4. Select the **Tools** tab from the **Properties** page.
5. Click **Defragment Now…** to open the Disk Defragmenter application.
6. Select the drive you want to defragment and then click **Defragment**. The application will notify you when the disk defragmentation is complete.

SPECIFICATIONS

This appendix lists specifications for the Q-Tel RMS and its components.

Q-Tel RMS

Overall System

	Specification
Performance	AAMI Standard EC:11:1991 for diagnostic ECG*
Display and Analysis Filters	Baseline wander, muscle artifact, 50/60 Hz line filters
Gain	2.5, 5, 10, 20, 40 mm/mV
Lead Groups	4 and 5 wire lead sets, supporting the standard Limb set, Limb plus one chest lead, and the Modified Chest Lead
Power	100-120 VAC 50/60 Hz 2.5A nominal 200-240 VAC 50/60 Hz 1.3A nominal

** Q-Tel RMS does not offer a calibration pulse, and prints exclusively at 25mm/s.*

Software

	Specification
Off the Shelf	Windows 10 Professional (64-bit), Microsoft Office Standard 2019, Microsoft SQL 2014, Adobe Acrobat Reader 9.0
Welch Allyn	Q-Tel RMS software, Q-Progress software

PC Hardware

	Tower and Turnkey Workstation Specifications*	Workstation Minimum Hardware Requirements
CPU	Intel® Xeon ® E-2144G CPU, 3.60 GHz	4th Generation Intel Core-i3
RAM	8 GB	4 GB
Hard drive	1 TB	20 GB (hard disk space)
DVD	8x DVD-RW	16X/40X DVD-ROM

**Tower and Turnkey workstation specifications are based on current hardware and are subject to change.*

Laser Printer

	Specification
Type	Multiple format ECG waveform and alphanumeric printing
Paper	Weight: 50 lb.-65 lb. Size: A, 8.5 x 11 in.
Resolution	600 DPI minimum

Back-up External Hard Drive

	Specification
Type	USB

Capacity	500 GB or greater

Monitor Display

	Specification
Content	4 and 8 channel ECG display and alphanumeric data I/O
Size	24” color LCD, 1920 x 1080
ECG Display (Tower)	3.5 – 8 seconds, depending upon number of channels
Displayed Data	ECG traces, heart rate, target heart rate, blood pressure, patient demographics and risk profiles, workload, METS, RPE, patient weight, and other user selectable parameters

Report Capabilities

	Specification
Session Reports	Succinct and complete session reports, full disclosure reports
Administrative Reports	Billable patient sessions, patient demographics, patient prescription, and lists for patients, insurance providers, physicians

ECG Analysis

	Specification
Heart Rate	Moving median estimate based upon R-R intervals
Arrhythmia Analysis	VERITAS™ ECG algorithms

Q-Tel RMS Telemetry Transmitter

Refer to the Welch Allyn S2 Transmitter User Manual, 9515-210-50-ENG for specifications.

Environmental Conditions

	Specification
Temperature	Operating: 59° to 90° F (15° to 32° C) Storage: 32° to 113° F (0° to 45° C)
Relative Humidity	Operating: 30 to 80% non-condensing Storage: 20-90% non-condensing

WLAN Infrastructure Requirements

Medical facility network requirements for secure deployment of the S2 telemetry transmitter with the Q-Tel RMS system are listed in the table below.

	Specification
WIRELESS PROTOCOL	802.11a/b/g/n 2.4 GHz and 5 GHz Disable 802.11b support on WLAN
802.11a Supported Rates	6, 9, 12, 18, 24, 36, 48, and 54 Mbps
802.11g Supported Rates	6, 9, 12, 18, 24, 36, 48, and 54 Mbps
802.11n Supported Rates	MCS0 through MCS7 6.5, 13, 19.5, 26, 39, 52, 58.5, and 65 Mbps
S2 TRANSMITTING POWER	17 dBm for 802.11b/g 2.4 GHz; 16 dBm for 802.11n 2.4 GHz 19 dBm for 802.11a/n 5 GHz
CHANNELS	Dependent on local WI-FI regulations per country ***NOTE:*** *Disabled dynamic channel selection on WLAN is recommended to reduce the possibility of data gaps.*
WI-FI SUPPORTED COUNTRY CODE	**United States** – FCC with the declared channels: 2.4 GHz: 1-11 *(channels 1, 6 and 11 are recommended)* 5 GHz U-NII-1: 36, 40, 44, 48 *(recommended for best 5 GHz performance)* 5 GHz U-NII-2: 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140 5 GHz U-NII-3: 149, 153, 157, 161, 165 ***NOTE:*** *Optimal channels must be identified during the site survey and at the time of system installation.*
WIRELESS SECURITY PROTOCOLS	WPA2-PSK-AES (WPA2-Personal), Passphrase
WMM / QoS	Data loss: < 5ppm; Disconnections: < 0.05 per device/day; Transient Latency: < 1900 ms
SSID Requirements	**Dedicated SSID** *(Hidden SSID is not supported.)* SSID and Pre-shared Passphrase up to 32 and 63 ASCII characters. SSID prioritization and minimum bandwidth configuration recommended. Disabled or exclusion of Period Session Timeout or similar policies in the SSID dedicated to the S2 is recommended to reduce the possibility of gaps when the AP terminates the session. Dedicated Monitoring VLAN is recommended.
IP ADDRESS ASSIGNMENT	Static or DHCP
MAXIMUM DEVICES PER ACCESS POINT	16
IP PROTOCOLS AND PORTS	UDP: one port per device according to the system configuration. Actual ports are communicated upon definition of system configuration; ICMP for management.
MINIMUM SIGNAL STRENGTH	-65 dBm in the coverage area
MINIMUM SIGNAL-TO-NOISE RATIO (SNR)	20 dB in the coverage area
BANDWIDTH USAGE	Outbound: < 80 Kbps Inbound: < 10 Kbps
TARGET TOTAL CHANNEL OCCUPANCY	< 50% is recommended

Workstation Software Specifications

This section contains the computer and accessory system requirements to operate the Q- Tel RMS Workstation on a computer other than one purchased from Welch Allyn.

Upon customer request, Welch Allyn will install the workstation software on customer-provided hardware that meets minimum requirements listed in the table below. Contact your local representative or Welch Allyn Sales Support for more information on availability and applicable fees.

Welch Allyn will not install or support Q-Tel RMS software if any component of the customer-provided hardware or accessories does not meet the requirements listed in this document. Customer-provided hardware must be completely assembled, and software installed per Welch Allyn installation instructions prior to commencement of applications training. The integrity of any 3rd party software other than the operating system cannot be guaranteed after installation of the Q-Tel RMS.

Workstation software requires some specific network settings in order to function properly. Contact your local representative for more details on the network requirements.

Computer Minimum Requirements

	Specification
Processor	Intel Pentium 4; clock speed 2.4 GHz or faster
System Memory	1 GB minimum
USB Ports	One (1) for optional USB peripherals
CD or DVD Drive	8X or faster
Hard Drive	20 GB minimum
Video	1280 x 1024 resolution

Other

	Specification
Operating System	Windows 10 Professional (64-bit)
Network	1 Gbit (minimum) NIC Card or 802.11G/N (minimum) wireless card

Ventilation Clearances

Allow at least 6 inches behind each Q-Tel RMS computer for ventilation. There are no side clearance requirements except for the laser printer, which requires about 3 inches minimum on each side.

Fuse Replacement

Blown fuses are to be replaced by a Welch Allyn field service representative or qualified technician only.

BTU Output

The estimated heat output from each system can be computed using this formula: Maximum amperage x 120 V x 3.41 = BTU/hr.

PHYSICIAN'S GUIDE TO SIGNAL ANALYSIS

This section is a guide to signal conditioning and ECG analysis in the Q-Tel RMS System. It explains how the ECG signal is acquired and filtered for display. This section also discusses the method and accuracy of the computed ECG heart rate and arrhythmia analysis, with notes on special points of interest. The overall goal of signal analysis is to produce useful ECG recordings from the frequently noisy signals associated with active patients exercising during rehab. Noise (artifact) comes from lead motion, electrode motion and muscle artifact, and AC power line. Proper electrode placement, skin preparation and patient instruction are important in collecting high quality ECG records.

Data Acquisition

The transmitter worn by the patient digitizes the ECG signal at a sampling rate of 10,000 samples per second per lead. The data is filtered and transmitted to Q-Tel RMS at a sampling rate of 500 samples per second per trace, with a resolution of 2.5 microvolts per LSB. The frequency bandwidth of the transmitted signal meets AAMI standard EC11:1991 for diagnostic quality ECG data.

Filters

The Q-Tel RMS system uses filters to improve the signal and reduce artifacts.

Baseline Wander Removal

To lower the ECG noise associated with body motion during exercise, the transmitted signal is first filtered with a baseline wander filter. This filter is characterized as a High Pass filter with the corner frequency at 0.5 Hz (i.e.: ECG frequencies higher than 0.5 Hz are passed without amplitude reduction). Frequencies lower than 0.5 Hz are attenuated, helping to hold the ECG baseline more constant. The baseline wander filter is always applied to the transmitted ECG signal.

50/60 Hz Line Filter

AC Power line noise is a typical artifact problem in ECG monitoring. It is caused by power line radiation that is picked up in the patient lead wires associated with the transmitter. This noise is minimized by the input amplifier design that has high common mode rejection (i.e., the rejection of signals that are the same on all electrodes). Under some conditions however, it cannot be eliminated completely by common mode rejection, so various signal processing techniques have been developed to further reduce power line noise on the ECG signals. The simplest approach is to provide a narrow stop band (or "notch") filter that is centered on the line frequency, either 50 or 60 Hz. This type of filter selectively removes only the chosen frequency, plus or minus a narrow range of frequencies. The assumptions underlying the use of this type of filter is that there is very little energy in the ECG (particularly, the QRS) in the chosen frequency band, and that the power line noise is stable enough to fall within the range of filtered frequencies. If the energy in the QRS at the chosen frequency is relatively low, there will be no distortion of the QRS. However, the amount of energy in the QRS complex at power line frequencies varies significantly with subtle differences in QRS waveform shape, some QRS shapes having no significant energy, while others can have a peak. If there is significant energy in the QRS at the line frequency, and it is filtered out along with the power line noise, two things happen: the shape of the QRS is altered, and there is a brief ringing at the power line frequency following the QRS in the ST segment, even for an ECG signal that has no power line noise.

To avoid the drawbacks of notch filters, Welch Allyn uses a digital signal processing technique to implement an adaptive power line noise-canceling algorithm. This algorithm is adaptive in that it uses an error minimizing technique to estimate the amplitude and phase of the power line induced noise. The estimate is subtracted from the original signal to remove the interference. This approach does not introduce ringing associated with high frequency QRS signals and is very effective in removing the line noise.

The Line Filter can be turned on or off in the Configuration Utility. If the filter is enabled, it is applied to all real time ECG data for all monitored patients.

Muscle Artifact and Pacer Spikes

The conventional approach to reducing muscle artifact and other high frequency noise in the live ECG has been to employ low pass filtering. Low pass filters (also called high cutoff filters) tend to smooth the data, much in the same way a human observer might imagine a smooth line to be drawn through the data. The disadvantage of this technique is that the filtering is applied to the whole ECG, so that high frequency information in the QRS complex can be lost. While conventional low pass filters can effectively smooth the baseline and the ST, T and P-wave segments of the ECG, they can also reduce R-wave amplitude, smooth over notches like Bundle Branch Block and slurs in the QRS complex, and can eliminate small, narrow Q or S waves.

Because of the importance of recording accurate ECG signals during exercise, particularly in Stress Testing, Welch Allyn has taken a new approach to the implementation of muscle artifact filters. Through a combination of filtering techniques, Welch Allyn has produced a time-varying filter capable of dynamically adjusting its cutoff frequency. For muscle artifact filtering the filter cutoff is varied dynamically so that the QRS complex is passed through the filter with full diagnostic bandwidth, but the region outside of the QRS is filtered more aggressively. This technique effectively eliminates the distortion of the QRS complex while maintaining effective smoothing of muscle artifact without compromising the ECG signal.

To control the bandwidth of the muscle artifact filter so that QRS complexes can be passed unfiltered, it is necessary to have an indication of the locations of the QRS complex onset and offset so that the filter coefficients can be adjusted. Classical QRS detection algorithms usually have significant delays associated with them, so are inappropriate for this application. Instead two mathematical operators called erosion (choosing the minimum value from a set of numbers) and dilation (choosing the maximum value from a set of numbers) are used to obtain a function that has a high value for waveform shapes that approximate a typical QRS complex (in terms of duration and magnitude of signal slopes), and a low value all other times. The coefficients of a low pass filter are adjusted so that signals which have a high value of the QRS indicator function are not filtered, while signals with the lowest values are maximally filtered (approximately 20 Hz low pass cutoff). Muscle noise does not typically fit the QRS indicator function profile and is therefore maximally filtered. This strategy for eliminating muscle artifact is very effective at providing smoothed ST segments, T-waves and P-waves without slurring the QRS onset or offset. However, it does sometimes produce waveforms that are at first sight puzzling. For some QRS shapes, and with significant high frequency muscle artifact amplitude, it is possible to see a short burst of artifact just before and just after the QRS (the artifact appears as short spikes close together). This effect results from the change in filter bandwidth, which is timed to occur just before and just after the QRS complex, so that Q-waves and S-waves are not filtered. The artifact nature of this signal is usually readily apparent by examining several QRS complexes in sequence. The other, seemingly paradoxical effect is that occasionally, with large bursts of artifact (due to muscle potentials or lead motion) the filter bandwidth opens-up, passing the artifact unfiltered. This effect is a "fail-safe" design, indicating that it is not possible for the filter to clearly distinguish between artifact and real QRS complexes. In cases like these, even low pass filtered data is very irregular, making reading the ECG difficult. If this effect occurs, it is usually a good indicator that an electrode is loose or needs to be moved to a location with less underlying muscle mass.

Pacer Spikes

The Muscle Artifact filter is designed to suppress high frequency noise and spikes that are not associated with a QRS shaped complex. Clearly artificial pacemaker spikes fall into this category; the display of pacer spikes on the ECG will be attenuated by the filtering associated with the Muscle Artifact filter.

The Muscle Artifact filter can be turned on or off on a patient-by-patient basis.

> ***NOTE:*** *While the system provides information about the presence of pacemaker spikes, it is not intended for use in the diagnosis of pacemaker efficacy.*

Beat Identification Accuracy

The algorithms used for beat identification and classification have been tested using records obtained from the MIT-BIH database. The records are typically about 30 minutes in duration and cover a wide range of cardiac conditions. The MIT records have been analyzed by a cardiologist and every beat identified and classified as either Normal Sinus or Ventricular. The records were analyzed using the VERITAS algorithms and the results compared with the known classifications.

Heart Rate

There are about 59,000 beats in the analyzed records; the median accuracy for beat identification was 99.95 percent, with the range extending from a minimum accuracy of 98.9% to many records classified with 100% accuracy. An estimate of the heart rate is computed and displayed at least every 2 seconds. The heart rate displayed is the average heart rate computed by the algorithm based on the average RR interval for detected beats. Depending on the heart rate, the computed average will be from within the last two seconds of displayed ECG data. The average heart rate is calculated as follows:

- Heart rate is computed as the average of the past 16 RR intervals.
- If the past 4 RR intervals produce an average rate less than or equal to 48 bpm, then the heart rate is the average rate of the past 4 RR intervals.

Normal Sinus Rhythm

On average, the Q-Tel algorithm correctly identifies a beat as Normal Sinus Rhythm 99.7% of the time, with a computed standard deviation of 0.48%. The data volume contained about 52,000 NSR beats; Only 174 were incorrectly identified as Ventricular, for a gross measurement of error of about 0.3 percent.

Ventricular Beats

On average, the algorithm correctly identifies a beat as Ventricular 96.7% of the time, with a computed standard deviation of 7% - slightly worse than the accuracy rate for NSR. The data volume contained about 7100 Ventricular beats; Only 187 were incorrectly identified as NSR, for a gross measurement of error of about 2.6% (accuracy of 97.4%), in reasonably good agreement with the record-based analysis of 96.7%.

Algorithm Notes

The above discussed beat detection and classification algorithms are the foundation for subsequent ECG alarm detection and reporting. The accurate detection of beats is critical for the accurate computation of heart rate, as well as for alarms for high and low heart rate, missing QRS, ventricular fibrillation, and asystole. The differentiation of normal sinus rhythm beats versus ventricular beats is critical to the identification of ventricular tachycardia, bigeminy, couplets, high PVC rates, trigeminy and ventricular rhythms and runs.

The following notes discuss a few important aspects of the alarm behavior.

Ventricular Fibrillation

The VFIB alarm remains active after the visual termination of ventricular fibrillation and does not terminate the reporting of VFIB until heart beats have been detected for at least 15 seconds. At the onset of VFIB the system will continue to report a heart rate, but that rate will quickly trend to zero. The heart rate will remain zero after the return of NSR for about 20 seconds as the algorithm re-learns the pattern of the rhythm and re-starts beat identification.

Missing QRS

Regularly missing QRS (for example, every fifth beat is followed by a long pause) will initially be reported as a Missing QRS alarm. After 3-5 cycles of this pattern the algorithm will determine that the ECG reflects an irregular rhythm and stop reporting the condition as a Missing QRS alarm. A return to NSR for a minute or more will re-start the detection of missing QRS.

FUNCTIONAL BLOCK DIAGRAM

This appendix shows the functional block diagram for the Q-Tel RMS Main Tower in detail.

Figure 35 Q-Tel Main Tower Functional Block Diagram