NORAV medical

ECG Excellence

NEMS-A

INSTRUCTIONS FOR USE

VERSION: 2.7.8.0

DATE: 06.08.2025

www.norav.com info@norav.com

General Information

NEMS-A. Instructions for Use.

For software version: 2.7.8.0 Software release date: 30.04.2025

For device models: Norav NR Series, Norav PC-ECG 1200 Series, NBP-24 NG, NBP One, Oscar 2, NSpiro™ Spirometry

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Copyright Information

Manufacturer and Contact Information

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Compliance Information

This product (software) complies with the applicable requirements of MDD 93/42/EEC.

CE
2797

This product (software) is intended for installation on equipment that meets the applicable edition of IEC 62368-1. Medical devices used in conjunction with this product must comply with the relevant IEC 60601 series standards, as appropriate. In addition, any electromagnetic interference generated by devices in this configuration must conform to Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014.

⚠Caution: Federal Law restricts this device to sale by or on the order of a licensed physician or healthcare provider.

Disclaimer

This product (software) is intended solely as a decision support system for individuals who have received appropriate medical training, and must not be used as the sole basis for making clinical decisions pertaining to patient diagnosis, care, or management. Any application of medical information from the product, other than its original design or intended use, is not advised and is considered misuse of the product.

Important Usage Notice

Like in all medical (including but not limited to ECG) data processing systems, noise or artifacts may produce false-positive events. Therefore, patient data must be reviewed and edited only by a qualified technician or physician who has received appropriate training. Norav Medical and its staff shall not be held liable for patient data reviewed or edited by an unqualified person, or by a qualified person acting outside the scope of appropriate medical judgment.

Norav Medical Limited Warranty

Norav Medical products are warranted to be free from manufacturing and material defects for a period of one (1) year from the date of shipment by Norav Medical or an authorized dealer to the original purchaser.

Expendable supply items, including but not limited to electrodes, lead wires, and patient cables, are excluded from this warranty. This warranty does not apply to any product that Norav Medical determines has been modified or damaged by the customer.

Except for the express warranties stated above, Norav Medical disclaims all warranties, including implied warranties of merchantability and fitness. The stated express warranties are in lieu of all obligations or liabilities on the part of Norav Medical for any damages, including but not limited to special, incidental, indirect, or consequential damages, arising out of or in connection with the use or performance of Norav Medical products.

Any action for breach of warranty must be commenced within one (1) year of the alleged breach or be forever barred. Any repairs made to the product that are not covered by this warranty shall be billed to the customer.

For service or technical support, please contact your local supplier or Norav Medical.

CONTENTS

Introduction

Document Conventions

Before working with the NEMS-A application, review this section to familiarize yourself with the recommended standards, labels, and practices used throughout this manual. These conventions are designed to ensure clarity, accuracy, and safety for both medical personnel and patients.

Warnings Cautions and Notes

Pay particular attention to specific points in a procedure when one of the following messages is displayed:

 **Warning**	Warnings call attention to possible hazards involving potential damage or injury to persons.
 **Caution**	Cautions refer to practices necessary to protect against potential damage to equipment or loss of equipment. Pay careful attention to instructions.
 **Note**	Notes provide pertinent information to help obtain optimum software/system performance or signify an important step or procedure requiring special attention.

Abbreviations and Acronyms

Abbreviation	Meaning
ABPM	Ambulatory Blood Pressure Monitoring
BP	Blood Pressure
ECG	Electrocardiogram
EMR	Electronic Medical Record
EMS	ECG Management System
GDT	Gerätedatentransfer (device data transfer) A format to transfer data among medical devices and software systems.
HRV	Heart Rate Variability
ID	Patient Identification
IFU	Instructions For Use
LP	Late Potential
LQTS	Long QT Syndrome
MI	Myocardial Infarction
NEMS	Norav ECG Management System
METS	Metabolic Stress Estimation
MRN	Medical Record Number
QT	Time from the start of the Q wave to the end of the T wave
Record	Rest/Stress/Holter ECG/ABPM test
SN	Serial Number
ST Segment	The ST segment encompasses the region between the end of ventricular depolarization and beginning of ventricular repolarization on the ECG (see https://en.ecgpedia.org/wiki/ST_Morphology)
USB	Universal Serial Bus

Equipment Symbols

Symbol	Description
	Type BF applied part
	Type CF applied part
	Class II equipment

Intended Use

NEMS-A Intended Use

The NEMS-A Management System software is specifically designed for use by medical professionals and point-of-care applications. It integrates seamlessly with local Norav databases, enabling efficient storage, retrieval, display, modification, and printing of high-resolution record data obtained from relevant devices.

NEMS-A also functions as an archive system, enabling the management of tests and patients and providing real-time status updates of tests, including those reports confirmed by a physician and unconfirmed reports.

NEMS-A supports the creation of new patients, allows viewing of existing patients and their test records, enables opening tests using relevant Norav apps, and offers additional functionalities like test comparison and analysis.

PC-ECG 1200 Intended Use

ECG Intended Use

ECG is intended to identify normal conditions, arrhythmia patterns, myocardial ischemia, rate abnormalities, or prognostic features in adults and pediatric populations. It is particularly useful for:

- Patients with suspected cardiac abnormalities.
- Populations at an age or period where routine baseline evaluation of ECG characteristics is essential.

QT Analysis within PC-ECG 1200 aids in assessing long QT syndrome (LQTS), which, in certain cases, can be managed with pharmacological therapy. Additionally, QT dispersion measurement, representing the variance between maximal and minimal QT values, indicates ventricular repolarization homogeneity.

PC-ECG 1200 has been tested to measure Heart Rate Variability (HRV) and Late Potential (LP) within a tolerance of 1 millisecond. The clinical significance of Heart Rate Variability and Late Potential, both features of the PC-ECG 1200, should be assessed by a physician.

Stress Testing Intended Use

Stress testing, a primary method for diagnosing myocardial ischemia related to coronary artery disease, evaluates the heart muscle's contractile capacity during exercise, recorded via ECG.

This testing is critical for patients experiencing angina pectoris, symptomatic of myocardial ischemia and indicative of reduced cardiac muscle blood supply.

In stress testing, the contractile capability of the heart muscle is captured by ECG during patient exercise. The ECG monitors patient exercise on a bicycle, treadmill, or other devices, with activity levels set by predefined protocols. ECG signals are recorded for the rest, exercise, and recovery phases of the exercise protocol. The changes in ECG waveforms are compared with the resting ECG records to detect myocardial ischemia or coronary artery disease (CAD), evaluate ST segment depression, and monitor CAD treatment efficacy. The significance of observed ST segment changes, analyzed through a validated algorithm, must be determined by a physician.

Holter NH-301 Intended Use

The Holter NH-301 analysis system is intended for patients requiring ambulatory (Holter) recordings from 1 to 336 hours. This recording is commonly used for:

- Evaluation of symptoms suggesting arrhythmia or myocardial ischemia.
- Documenting therapeutic interventions in individual patients or patient groups.
- ST segment changes evaluation.
- Patient's response assessment after resuming occupational or recreational activities, for example, post-myocardial infarction or cardiac surgery.
- Clinical and epidemiological research studies.

The NH-301 Holter analysis system contains Heart Rate Variability (HRV) measurements. The clinical significance of HRV measurements should be determined by a physician.

NSpiro™ Intended Use

NSpiro is a spirometry system for accurate measurements crucial in asthma management, detecting acute respiratory disorders, and pharmaceutical trials.

The system can be used standalone or integrated with the Norav Medical ECG Management System (NEMS) for expanded functionality. NSpiro includes a powerful SQL database and offers optional interfaces for connectivity with various hospital information systems, supporting a wide range of clinical applications.

ABPM Devices Intended Use

The NBP One, Oscar 2, and NBP-24 NG are advanced noninvasive oscillometric ambulatory blood pressure monitoring (ABPM) devices intended for use with the NEMS-A system. These devices can record and display up to 250 measurements or provide 24 hours of systolic and diastolic blood pressure and heart rate monitoring.

They are intended for use as aids or adjuncts to diagnosis and treatment when measuring systolic and diastolic blood pressures over an extended period is necessary for adult and pediatric patients (over 4 years). These systems are intended solely for measurement, recording, and display purposes to assist licensed physicians in making diagnoses.

Norav Recorder (NR) Intended Use

The Norav NR series (hereafter referred to as "NR") devices enable the capture of ECG waveforms with subsequent recording and/or data transmission to an external computer.

The NR series devices are intended for executing:

- Ambulatory Holter ECG
- Ambulatory Event ECG
- Resting ECG
- Stress ECG
- Telemetry ECG

The following NR-series devices are compatible with the NEMS-A system and related applications:

Model	ECG channels	Patient cable Leads	Pacemaker detection	Acceleration sensor	Respiration signal	Voice recording	Bluetooth communication	USB communication	Ambulatory (Holter recording)	Rest ing ECG	Stress ECG
NR-302	3	3, 5, 7	yes	no	no	no	no	yes	yes	no	no
NR-314	3	3, 5, 7	yes	yes	yes	yes	yes	yes	yes	no	no
NR-314-T	6	4, 5	yes	no	no	no	yes	no	no	no	no
NR-1207	3, 12	3, 5, 7, 10	yes	yes	yes	yes	yes	yes	yes	no	no
NR-1207-3	3, 6, 12	3, 4, 5, 7, 10	yes	yes	yes	yes	yes	yes	yes	yes	yes
NR-1207-E	6,12	4, 5, 10	yes	no	no	no	yes	no	no	yes	yes
NR-314-P	3	3, 4, 5	yes	yes	no	no	yes	yes	yes	no	no

Figure **1**. Norav Recorder Devices Intended Use - NR Feature Matrix

The NR series devices are indicated for use on patients who may be asymptomatic or who may experience transient symptoms suggesting conditions like arrhythmia or myocardial ischemia. They are used for evaluating therapeutic interventions, monitoring patients for ST segment changes, assessing patient responses to post-cardiac events, in clinical research, and for patients with pacemakers or requiring QT interval reporting.

For more detailed information, please refer to the relevant NR device manual.

The NR series devices are designed for use by medical clinical professionals who must instruct patients on their correct use, ensuring that patients clearly understand these instructions.

Overview

This section provides an overview of the NEMS-A software package, detailing its contents and compatible applications. Each application utilizes certain devices and serves specific diagnostic functions and is integrated with the NEMS-A management system to enhance medical and diagnostic procedures.

Norav Medical ECG Management System (NEMS-A) is a comprehensive management solution that consolidates studies and patient records into a single application. It automates workflow execution, data storage, and ECG display, thereby improving patient care while reducing processing times and costs.

NEMS-A supports a wide range of cardiac medical devices and records, such as Resting ECG, Stress ECG, Holter ECG, Ambulatory Blood Pressure, Spirometry, as well as non-Norav PDF reports.

Main Features

- Patients management
- Test Records management
- Advanced engine enabling search through patients' data and Records
- Holter and ABPM devices management
- Managing Patient Groups, Referring Physicians, Technicians, and Reporting MD lists.

Package Contents

The NEMS-A package contains the following elements:

Software installation media

NEMS-A software installation package

NEMS-A Instructions for Use

Readme.txt

Software key

Compatible Applications

The NEMS-A application is compatible with the following applications:

- Norav PC-ECG (Rest, Stress, HRV, LP, and ECG "monitoring")
- Norav Holter NH-301
- Norav NM-700 Telemetry
- Norav HMS
- NSpiro™

Compatible Devices

The NEMS-A application is compatible with the following Norav and 3rd party devices either directly or through relevant compatible applications:

- Norav NR series devices, including NR-314-P
- PC-ECG 1200 Series
- NBP-24 NG
- NBP One

- Oscar 2
- NSpiro™ Spirometry

Recommended PC Specifications

Component	NEMS-A Client
CPU	i5 @ 2.0 GHz 10th generation
RAM	4 GB
Free Disk Space	8 GB
Operating System	Windows 10 Pro 32/64 bit or Windows 11 Pro
Free USB/LAN Ports	1
Prerequisites	.NET Framework v4.72
Installed Drivers	HMS ABPM device NBP One device Norav driver Sentinel driver Norav printer driver
Additional Software (3rd parties)	HMS ABPM SPIRO PDF Viewer

NEMS-A Installation

The software package is compatible with the Windows 10/11 operating system.

To install the NEMS-A application:

1. Run NEMS-A Setup from the NEMS-A software installation package. The NEMS Setup Wizard dialog box will appear.

Figure **2**. NEMS-A Installation - NEMS Prerequisites Setup Wizard Dialog Box

2. Click **Next**. The Prerequisites dialog box will be displayed.
3. Select the prerequisite software you need to install and click **Next**.

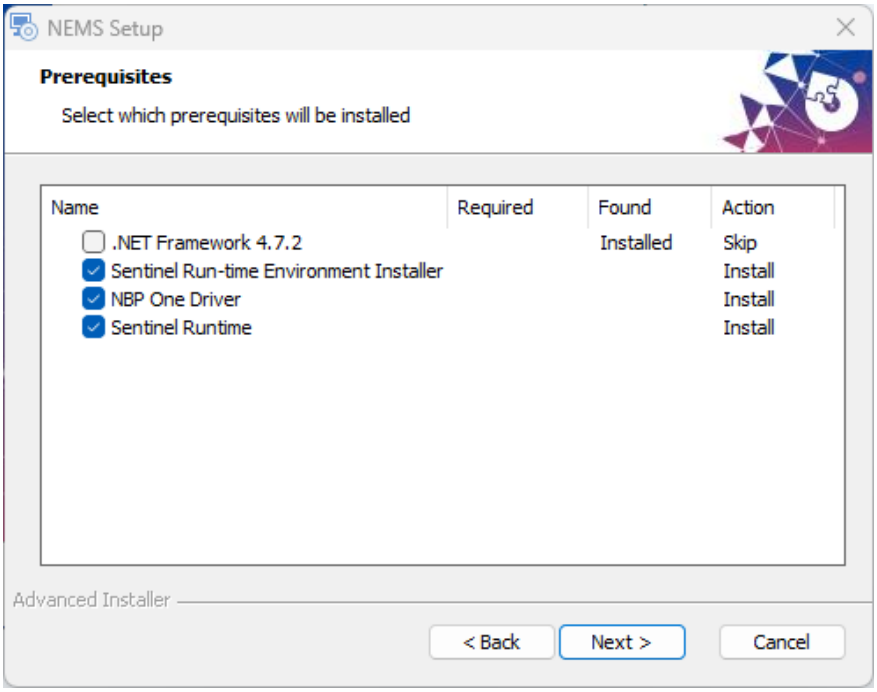


Figure **3**. NEMS-A Installation - Prerequisites

4. You will be prompted with a pop-up window indicating the progress of the prerequisites installation. Once the prerequisites installation is complete, the NEMS Setup Wizard dialog box will appear.

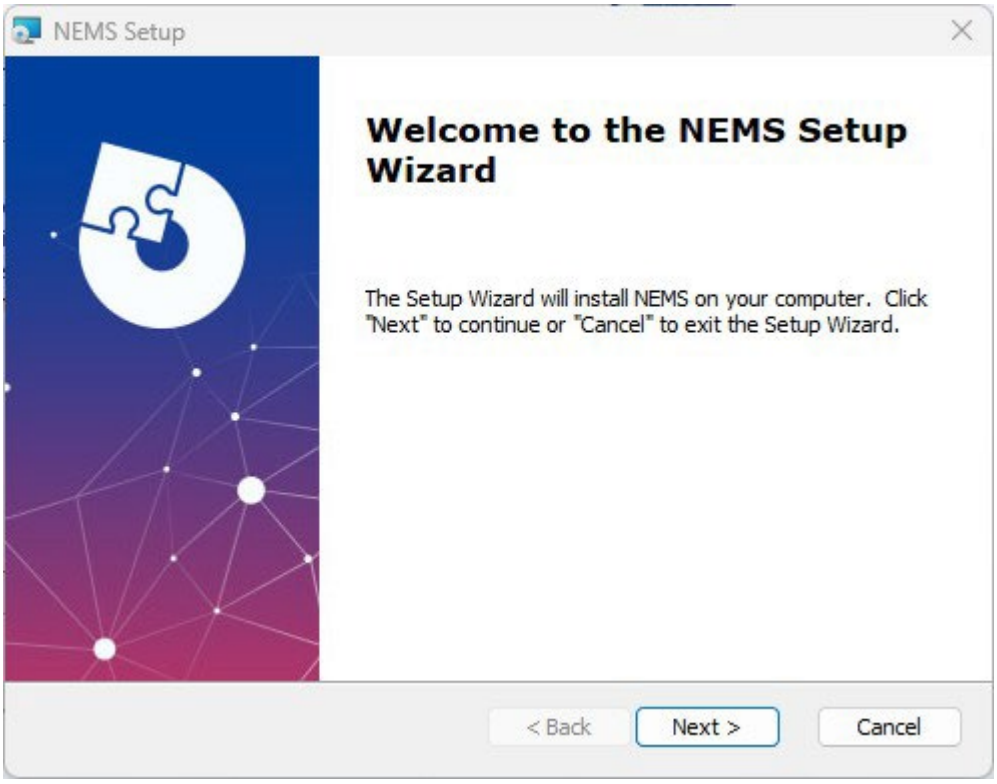


Figure **4**. NEMS-A Installation - NEMS Setup Wizard Dialog Box

5. Click **Next**. The Select Installation Folder dialog box will be displayed.

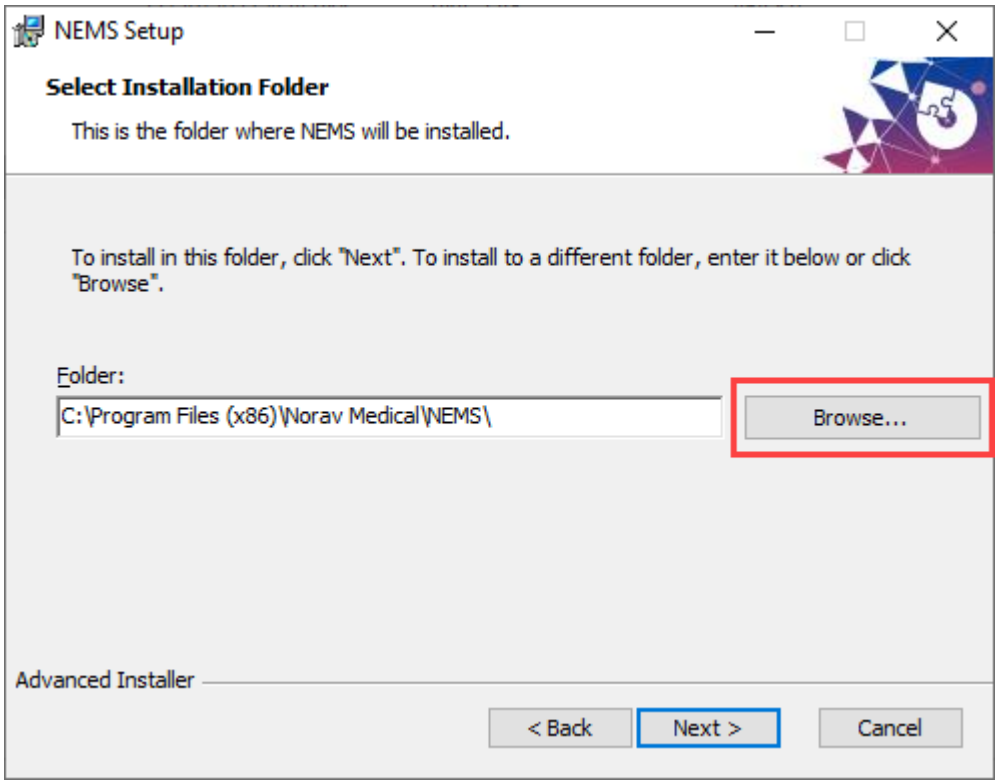


Figure **5**. NEMS-A Installation - Select Installation Folder Dialog Box

6. To install NEMS-A in the default location, click **Next**.
7. **(Optionally)** To install NEMS-A in a different location:
   - Click the **Folder** text field and type in the new installation path manually.

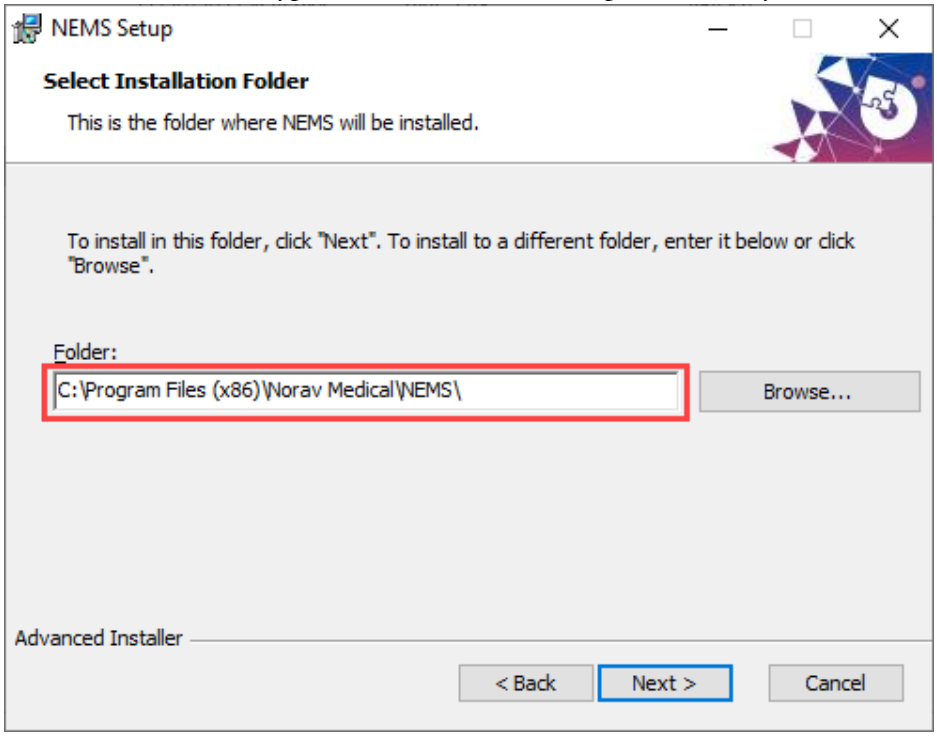


Figure **6**. NEMS-A Installation - Selecting Installation Folder Manually

   - Click **Browse** and follow the sequence::
     7.1. Navigate to the desired location.
     7.2. **(Optionally)** Create a folder to install NEMS-A in.
     7.3. Select the relevant folder.
     7.4. Click **OK**.
     7.5. Click **Next**.

8. The Ready to Install dialog box will appear. Click **Install** to launch the installation process.

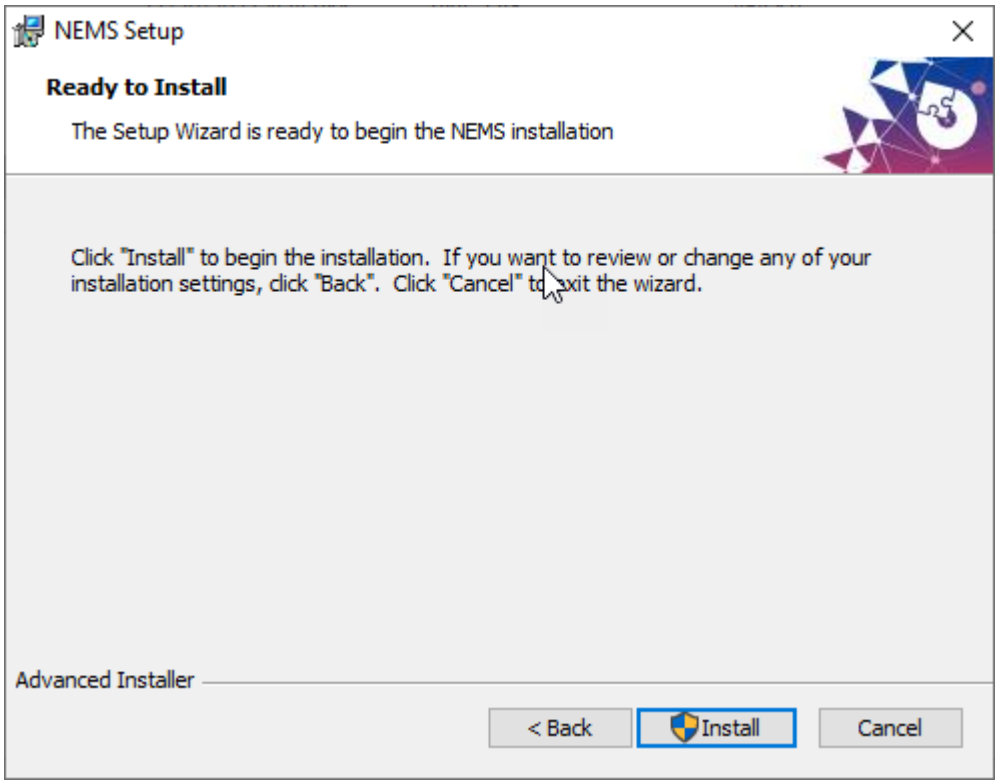


Figure **7**. NEMS-A Installation - Ready to Install Dialog Box

9. The Installing NEMS prompt box will appear.

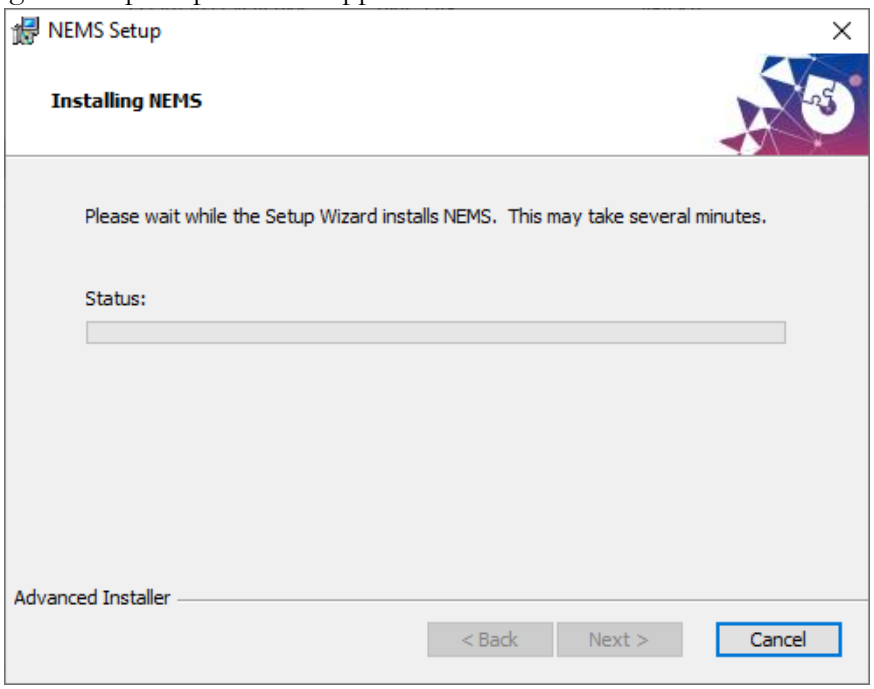
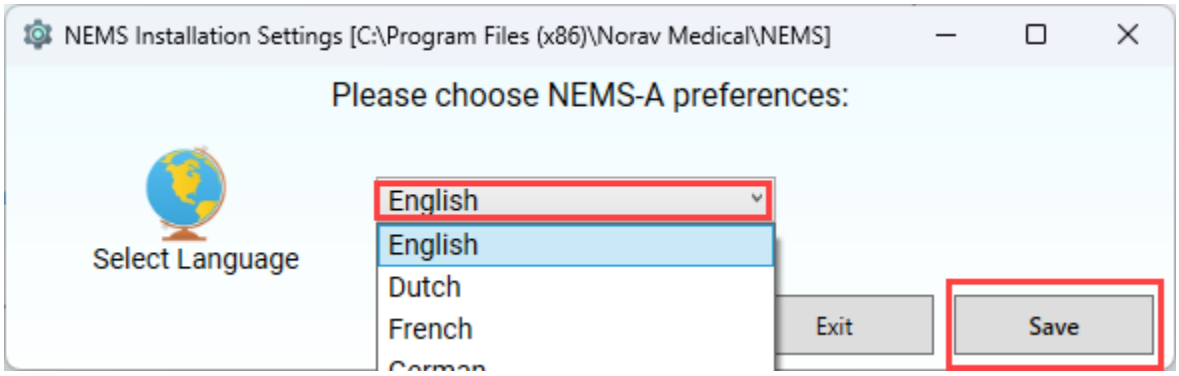


Figure **8**. NEMS-A Installation - Installing NEMS Box

10. During the installation process, you will be prompted with the Select Language dialog box to set the application language:
    10.1. Click the drop-down menu and choose the language you require.
    10.2. Click **Save** to confirm your selection and continue with the installation.

Figure **9**. NEMS-A Installation - Select Language



11. After the installation is complete, the Completing the NEMS Setup dialog box will appear. Click **Finish** to exit the Setup Wizard and complete the installation process.

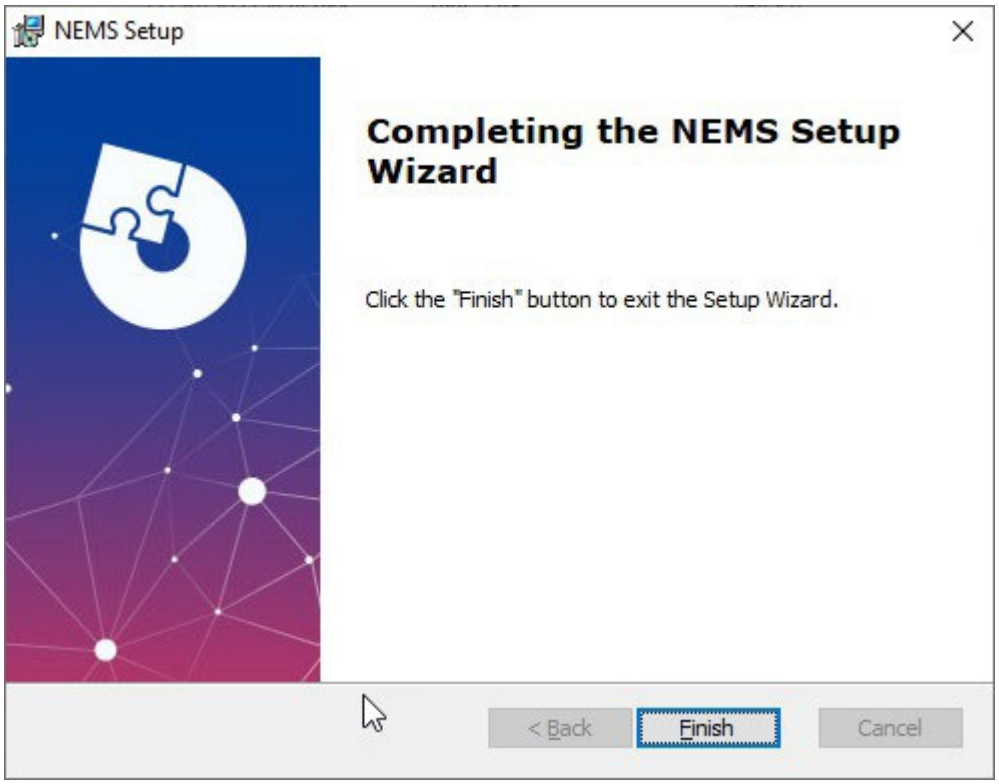


Figure **10**. NEMS-A Installation - Completing the NEMS Setup dialog box

12. After completing the installation, the NEMS-A application icon will appear on your PC desktop.

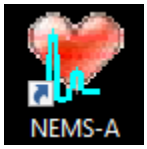
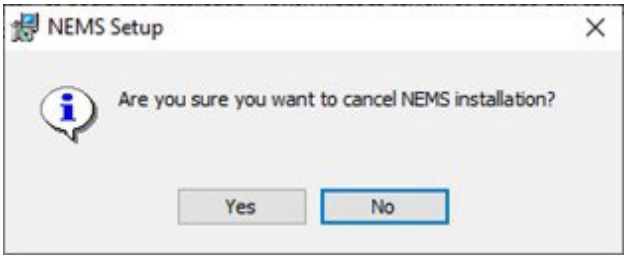


Figure **11**. NEMS-A Installation - NEMS-A Icon

Additional **<Back** and **Cancel** buttons are available in the appropriate dialog boxes throughout the installation process. Click **<Back** to return to the previous dialog box. Click Cancel if you want to abort the installation process.

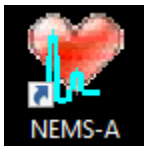
Figure **12**. NEMS-A Installation - Cancel Installation



First Launch Set Up

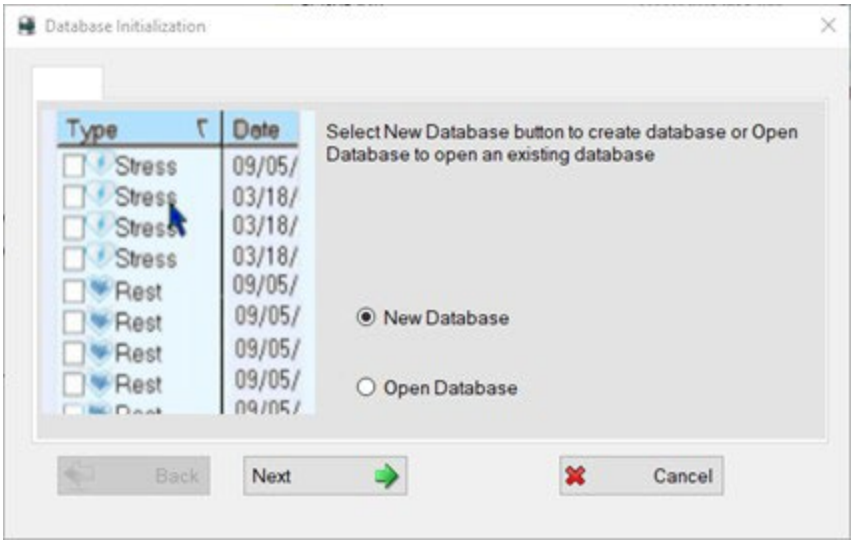
When you launch NEMS-A for the first time after installing it, you need to confirm or configure the NEMS-A database path:

1. Click the NEMS-A icon on your computer desktop to start the application.



2. You will be prompted with the **Database Initialization** dialog box.

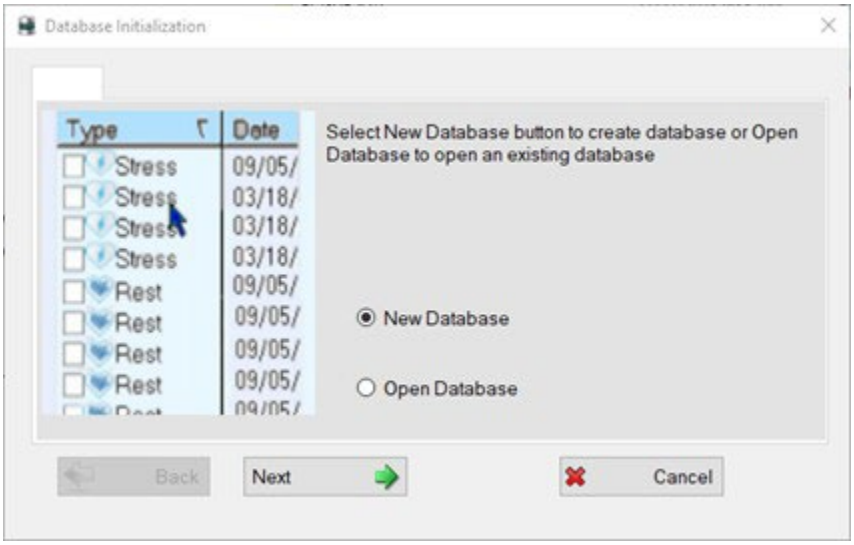
Figure **13**. First Launch Set Up - Selecting Database



3. If there is no existing database:

3.1. Select the **New Database** option (if not already selected).

Figure **14**. First Launch Set Up - Selecting Database



3.2. Click **Next**. The **Create New Database** dialog box will be displayed.

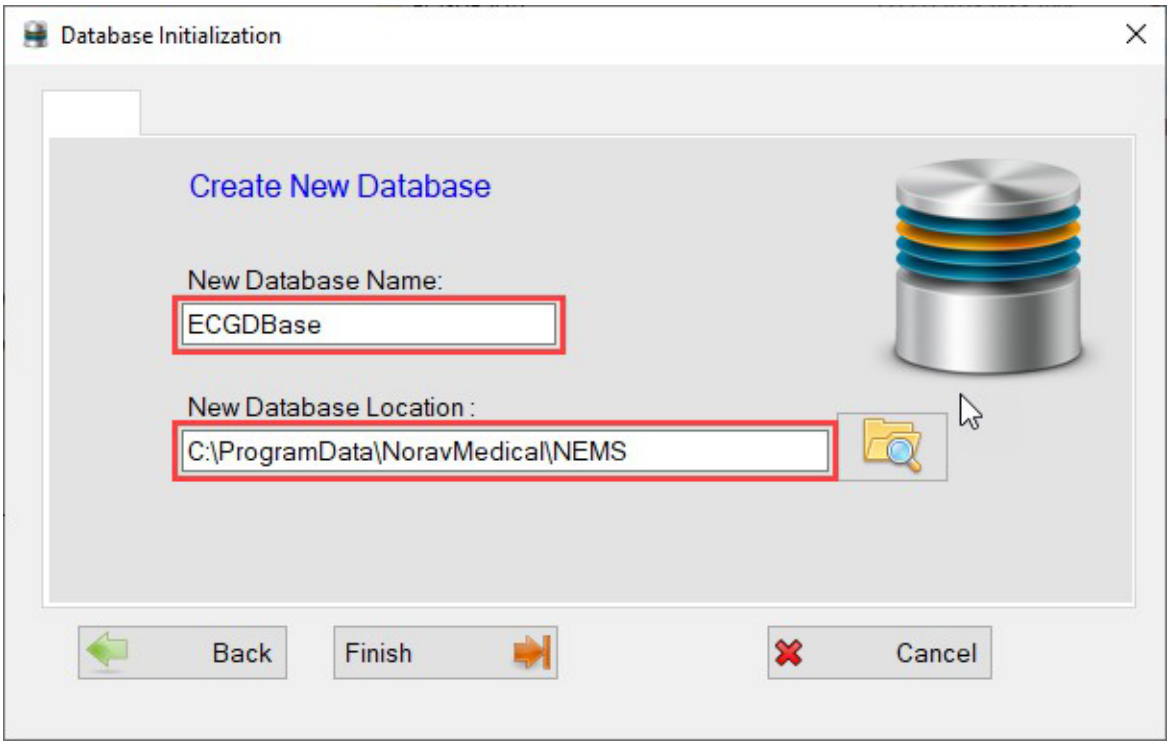


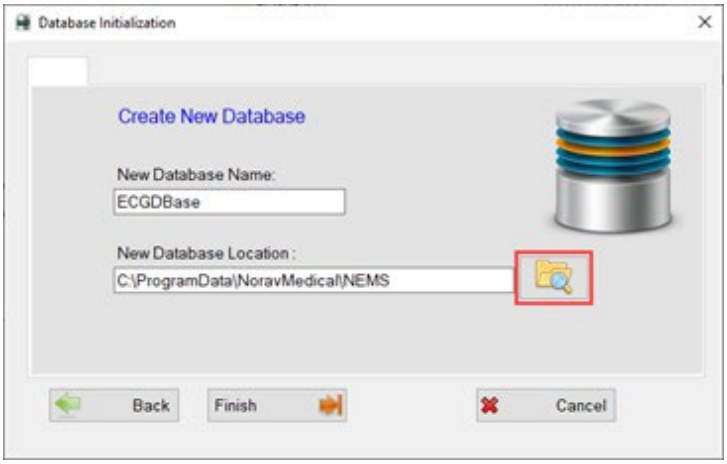
Figure **15**. First Launch Set Up - Create New Database Dialog Box

3.3. **(Optionally)** Click the **New Database Name** text field and modify the default database name manually.

3.4. **(Optionally)** To modify the default **New Database Location** path:

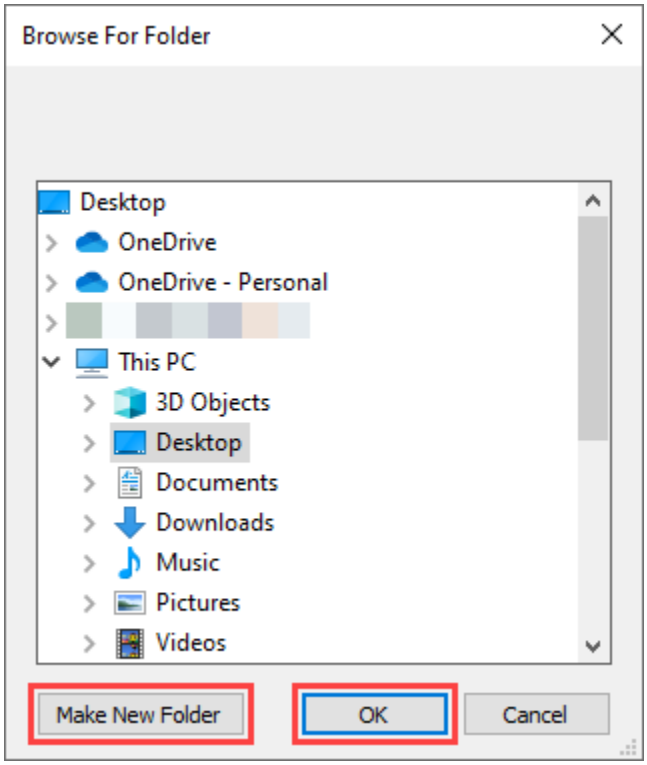
- Click the **New Database Location** text field and modify the default database location manually.
- Click the Search icon to the right of the **New Database Location** text field. The **Browse For Folder** dialog box is displayed:

Figure **16**. First Launch Set Up - Selecting Folder



3.4.1. Navigate to the location you need and choose a relevant folder.

Figure **17**. First Launch Set Up - Browse For Folder



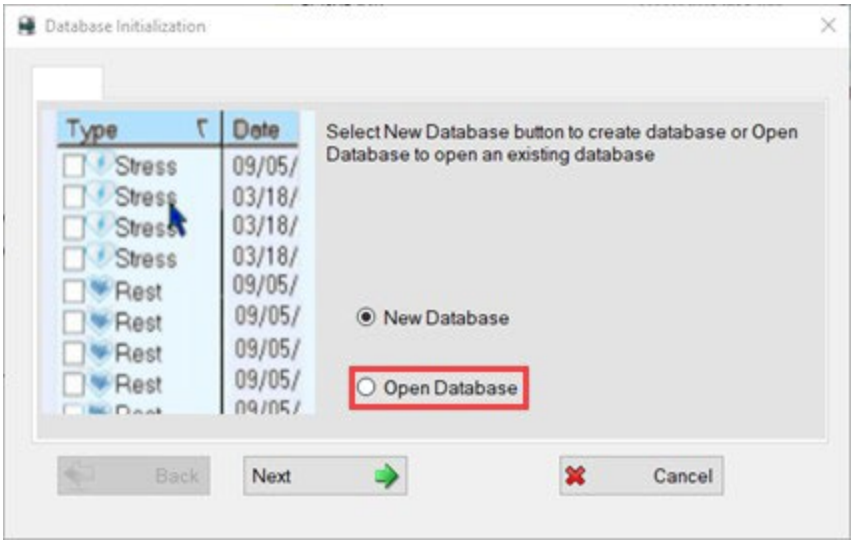
3.4.2. **(Optionally)** To create a new folder, click **Make New Folder** in the bottom-left corner of the dialog box and type in the folder name manually.

3.4.3. After you have selected the folder, click **OK** to confirm the new database location path. You will be redirected to the **Create New Database** dialog box.

4. **(Optionally)** If there is a database on your PC you want to connect to the NEMS-A application:

4.1. Select the **Open Database** option.

Figure **18**. First Launch Set Up - Open Database



4.2. Click **Next**. The **Open Database** dialog box is displayed.

4.3. **(Optionally)** To set or modify the path to the existing database you want to open:

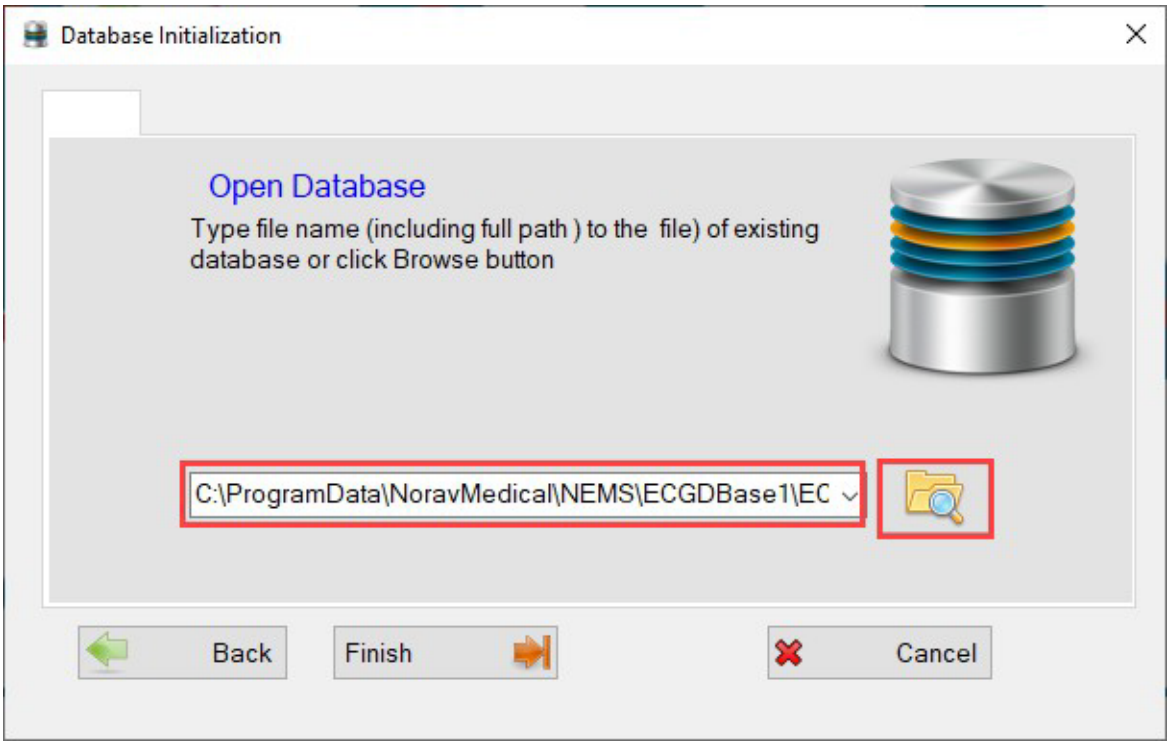
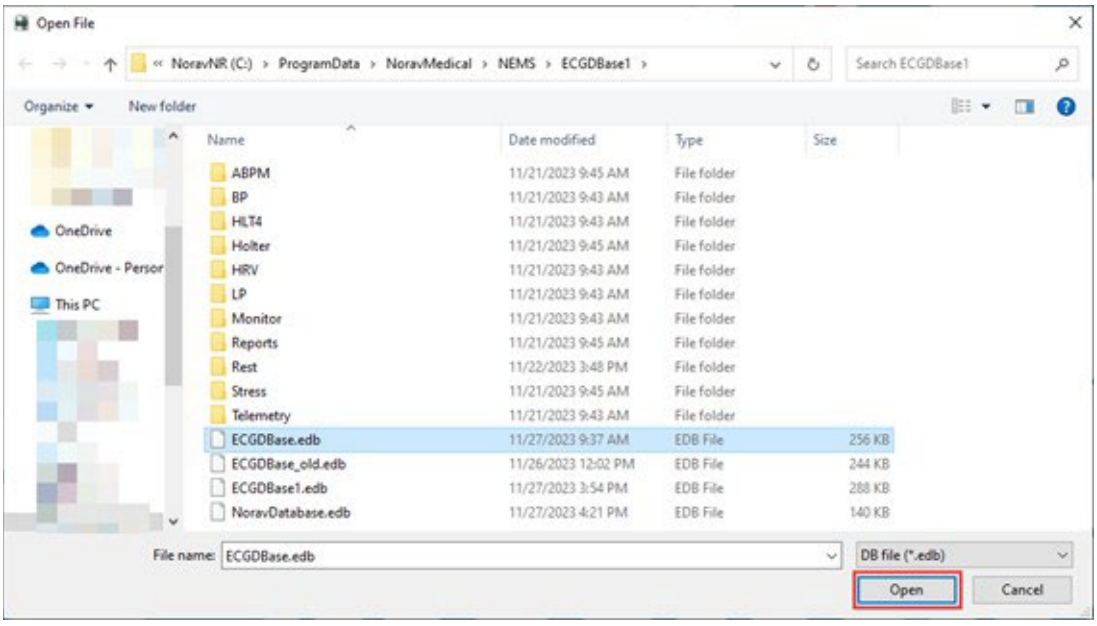


Figure **19**. First Launch Set Up - Open Database Dialog Box

- Click the text field and type in the full path (including the data base file name) to the existing database you want to open.
- Click the Search icon to the right of the text field. The **Open File** dialog box is displayed:

Figure **20**. First Launch Set Up - Open File Dialog Box



4.3.1. Navigate to the location where the existing database file is stored.
4.3.2. Select the database file (in .edb format).
4.3.3. Click **OK** to open the database file. You will be redirected to the **Open Database** dialog box.

5. Click **Finish.**

Figure **21**. First Launch Set Up - Click Finish

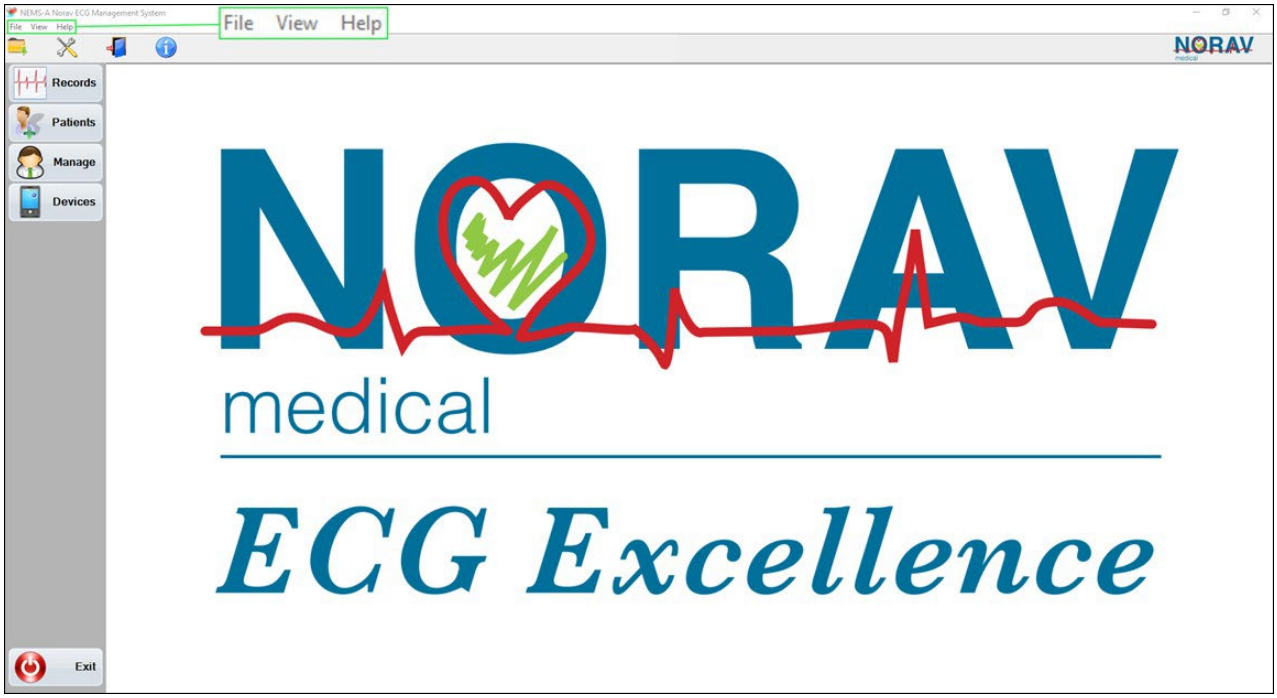
6. When the database configuration is completed, the NEMS-A application window will appear.
   Figure **22**. First Launch Set Up - NEMS-A Window

Additional **<Back** and **Cancel** buttons are available in the appropriate dialog boxes throughout the installation process. Click **<Back** to return to the previous dialog box. Click **Cancel** if you want to abort the installation process.

Interface Core Elements Overview

In this chapter, we will provide an overview of the basic interface elements of the NEMS-A application. You will learn about the functionality of the following user interface (UI) elements: the top **Menu Bar**, the **Main Toolbar**, **Records**, **Patients**, **Manage**, and **Devices** tabs on the left; the **Exit** button; and the window control buttons.

Figure **23**. Interface Overview - NEMS-A Initial Screen



Here, a detailed description of the basic interface elements is provided, along with guidance on how to use them. To enhance clarity, the elements in the figures are distinguished by color:

- Actionable elements, such as buttons and menus, are marked in red.
- Non-actionable elements, including informative elements or specific screen areas, are marked in green.

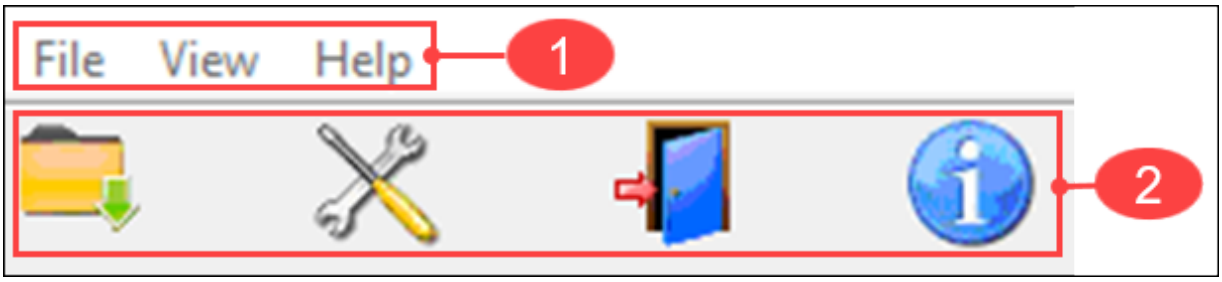


Figure **24**. Interface Overview - Menu Bar and Main Toolbar

Figure **25**. Interface Overview - Tabs, Exit, View Area

The elements depicted in figures above are consistently available across all screens and views within the NEMS-A app:

1. **Menu Bar**: Contains menus and options that control functions such as record import, database initialization, setup menu, about the app feature, etc.
2. **Main Toolbar**: Contains options for importing and setup, exit button, and about the app feature.
3. **Tabs**: A designated sidebar that allows switching between different tabs available within the app - **Records**, **Patients**, **Manage**, **Devices**. These tabs enable managing test records, patients, patients' data, medical personnel lists, and device scanning.
4. **Exit button**: Click this button to close the application.
5. **View Area**: In contrast to other interface elements that stay mostly the same on every screen, this area contains unique content, data, and controls within each application tab.
6. **Window Control Buttons:** Features a standard set of controls for window states.

Please refer to the relevant sections in this Chapter for detailed descriptions of each element.

Menu Bar

The **Menu Bar** contains menus and options that manage general functions of the NEMS-A, such as importing records, database initialization, setup menu, and the about feature. A detailed description of the **Menu Bar** components can be found below.

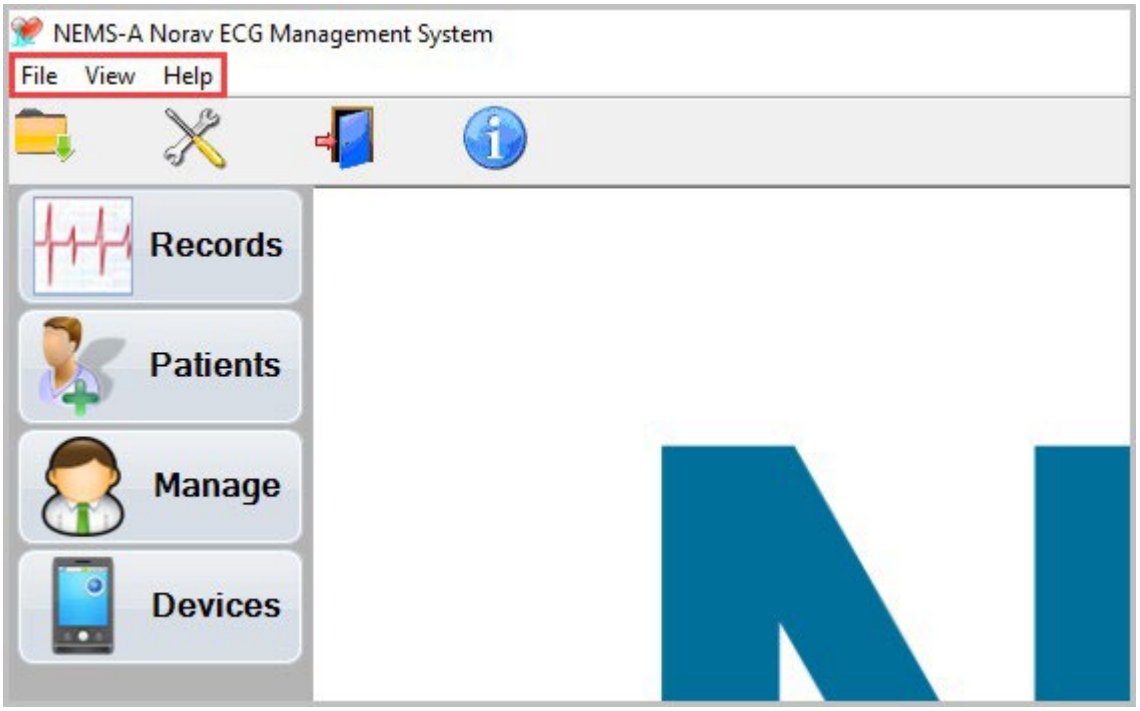


Figure **26**. Interface Overview - Menu Bar

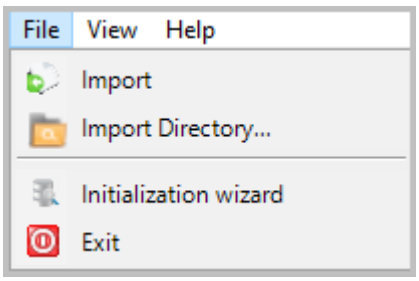
The **Menu Bar** includes three drop-down menus:

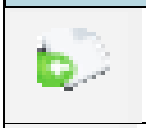
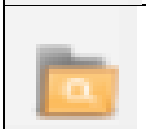
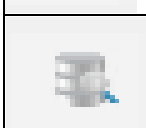
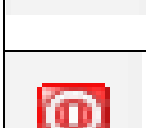
- **File**
- **View**
- **Help**

File Menu

The **File** menu contains the following options:

Figure **27**. Interface Overview - File Menu

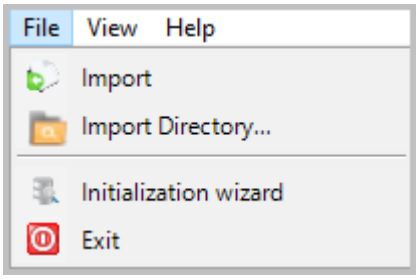


Icon	Description
	**Import**: Click to import a record file supported by NEMS-A.
	**Import Directory**: Click to import a folder with record files supported by NEMS-A.
	**Initialization Wizard**: Click to set up a path to the NEMS-A database.
	**Exit**: Click to exit NEMS-A and close the application.

To import a record file:

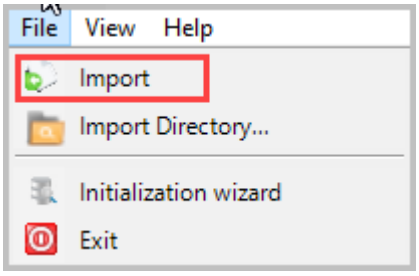
1. Click the **File** menu in the **Menu Bar** to expand it.

Figure **28**. Interface Overview - File Menu



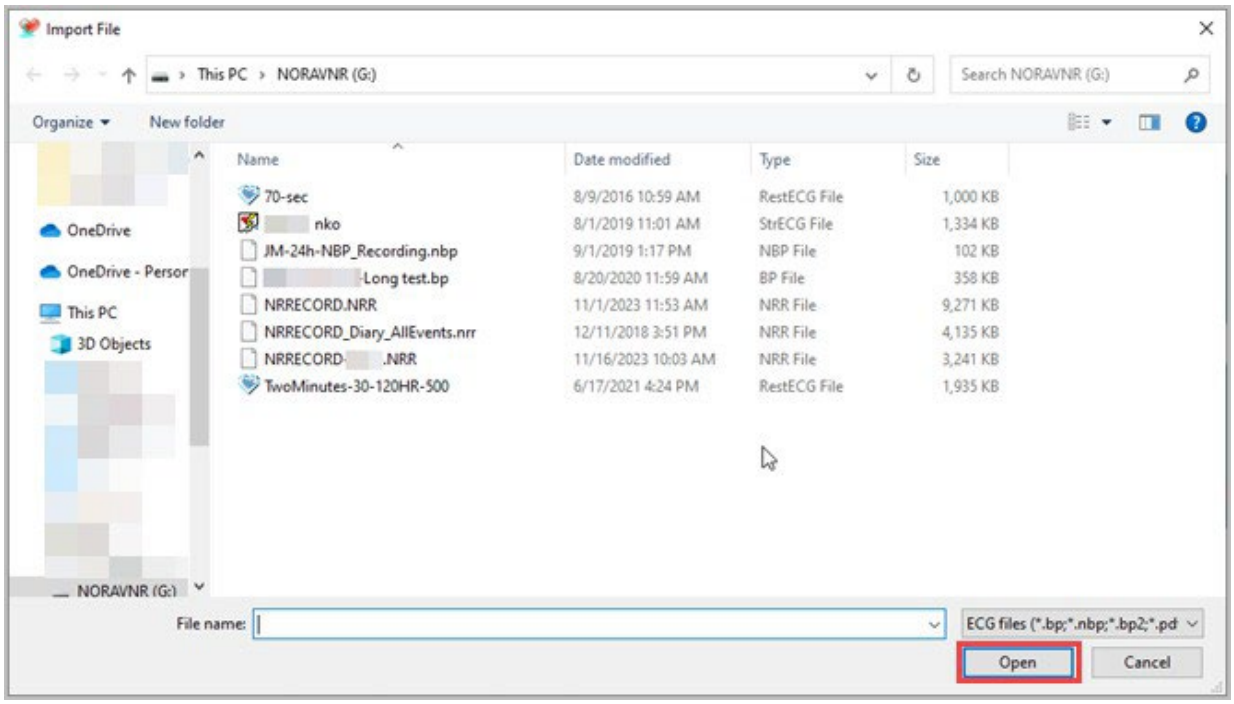
2. Click **Import** to open the **Import File** dialog box.

Figure **29**. File Menu - Import Option



3. Navigate to the location with the files supported by NEMS-A that you want to import.

Figure **30**. File Menu - Import File Dialog Box



4. Select the file(s) you want to import:
    - Click an individual file to select it.
    - Select several files using one of these methods:

    ▪ **Using Click-and-Drag:**

    4.1. Click any empty space in the Windows Explorer window, hold down the left mouse button, and drag your cursor over the files you want to select. This will create a selection box.

    4.2. Ensure that all files you wish to select are within the boundaries of this selection box.

    4.3. Release the mouse button to complete the selection.

    ▪ **Using Ctrl + Click:**

    4.1. Click on the first file you want to select.

    4.2. Hold down the Ctrl key.

    4.3. While holding the Ctrl key, click on each additional file you want to select. Each clicked file will be added to your selection.

    ▪ **Using Shift + Click:**

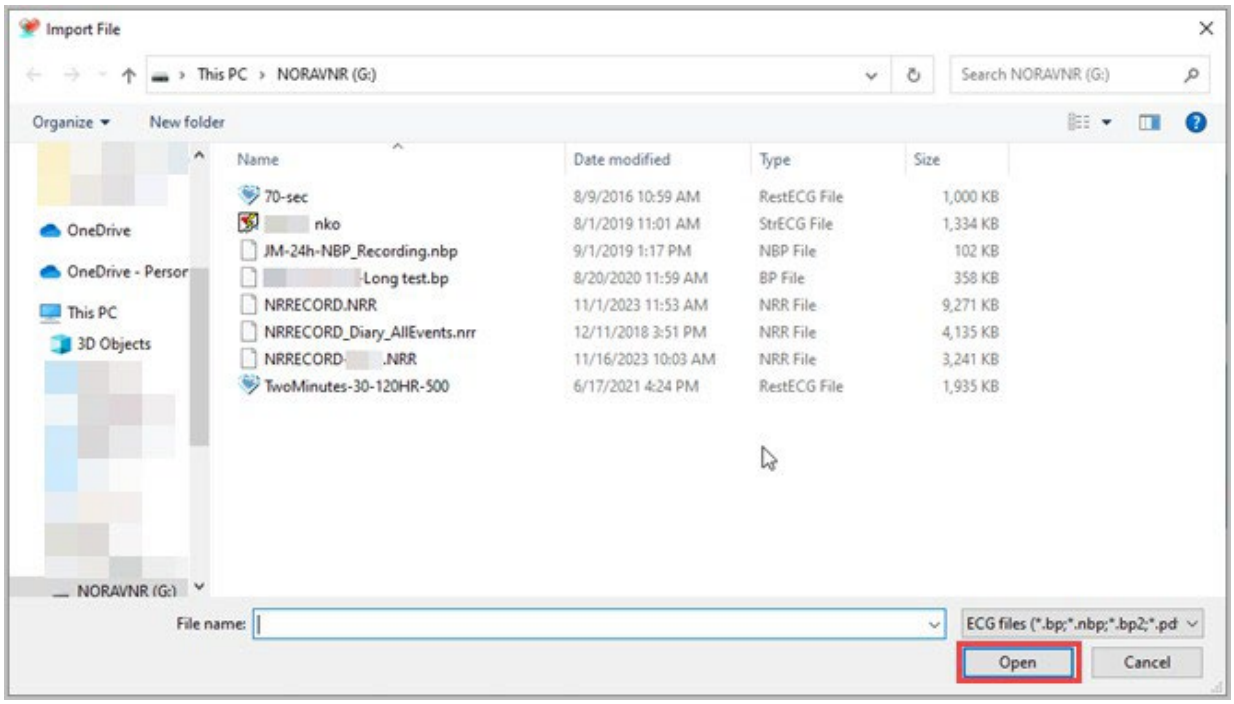
    4.1. Click on the first file in a series of files you want to select.

    4.2. Hold down the Shift key.

    4.3. Click on the last file. All files between the first and last file you clicked will be selected.

    ▪ If you want to select all files in the given folder, click **Ctrl + A**.
5. Click **Open** in the bottom-right corner to import the file(s).

Figure **31**. File Menu - Importing Files



6. You will be prompted with the **Results** dialog box showing the process and outcomes of the importing. After the importing is complete, you will see the information on the following:

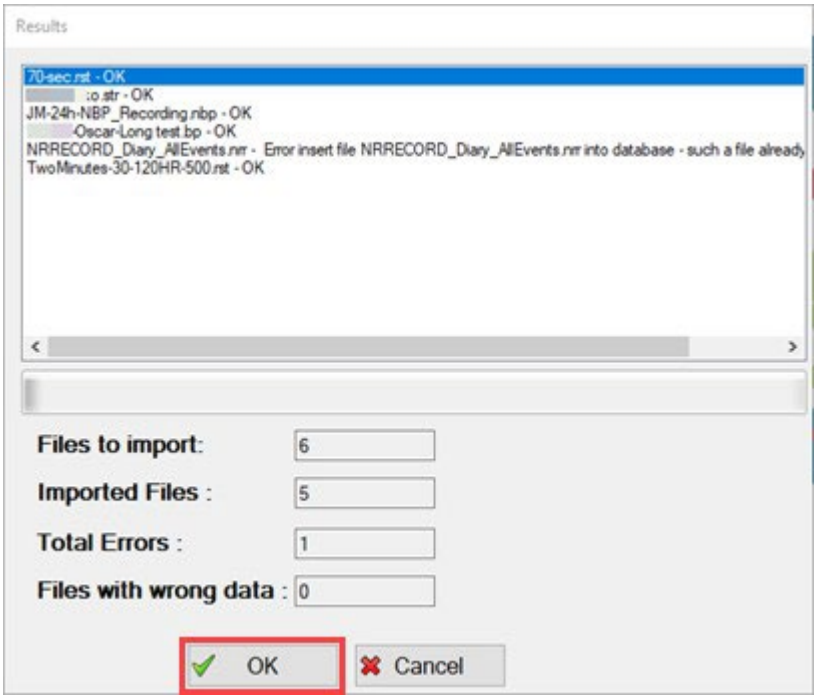


Figure **32**. File Menu - Results Dialog Box

- **Files to import:** The overall number of files you have selected for the import.
- **Imported files:** The number of files that were imported (no errors occurred).
- **Total errors:** The number of files that were not imported due to errors.
- **Files with wrong data:** The number of files that were validated as

records with incorrect data.

7. Click **OK** to close the **Results** dialog box and finish the import, or click **Cancel** to abort.

To import a directory:

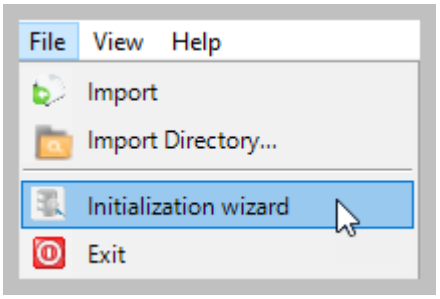
1. Click the **File** menu in the **Menu Bar** to expand it.
2. Click **Import Directory** to open the **Browse for Folder** dialog box.
3. Navigate to the location with the folder containing files supported by NEMS-A that you want to import.
4. In the **Browse for Folder** dialog box, select the folder you want to import. You can select only **one** folder.
5. Click **OK**.
6. You will be prompted with the **Results** dialog box showing the process and outcomes of the importing. After the importing is complete you will see the information on the following:
    - **Files to import:** The overall number of files you have selected for the import.
    - **Imported files:** The number of files that were imported (no errors occurred).
    - **Total errors:** The number of files that were not imported due to errors.
    - **Files with wrong data:** The number of files that were validated as records with incorrect data.
7. Click **OK** to close the **Results** dialog box and finish the import, or click **Cancel** to abort.

To setup a path to the NEMS-A database:

Note: If you already have an existing NEMS-A database, connecting a new database will make all the records contained in the existing database unavailable.

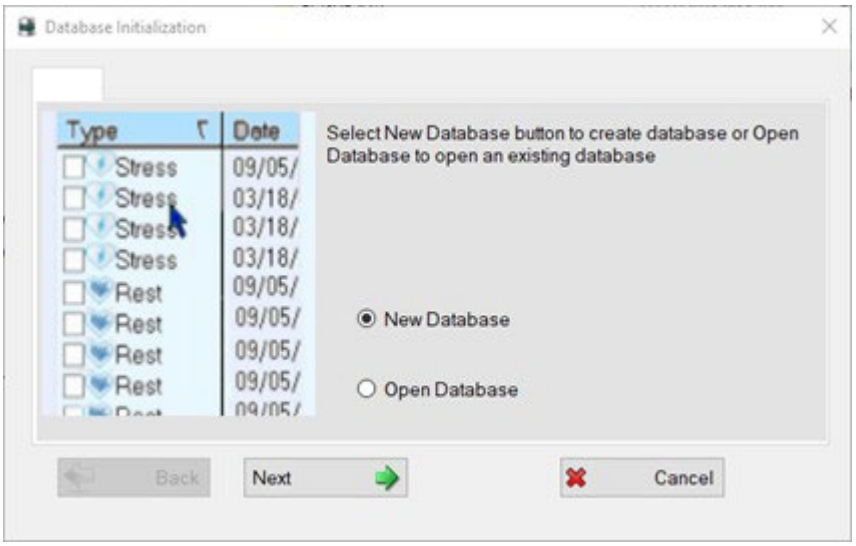
1. Click the **File** menu in the **Menu Bar** to expand it.

Figure **33**. File Menu - **Initialization Wizard**



1.1. Click **Initialization Wizard** in the **File** menu. The **Database Initialization** dialog box will be displayed.

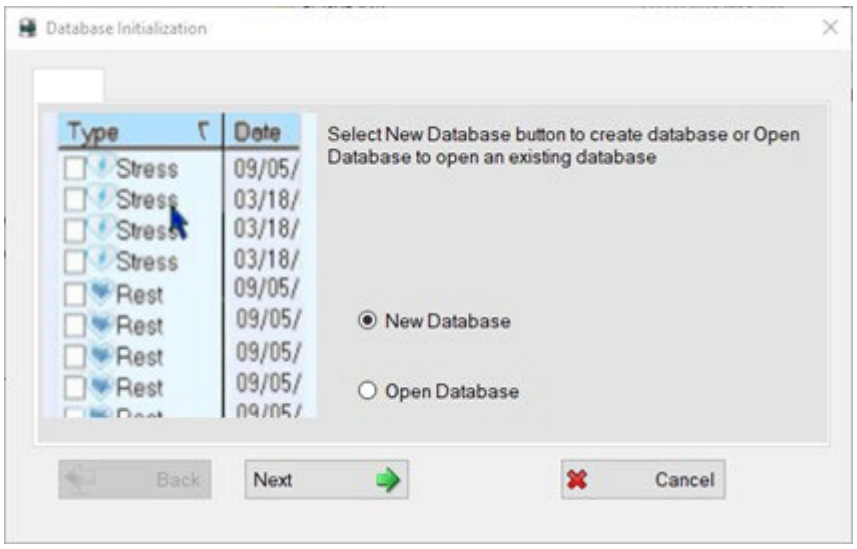
Figure **34**. File Menu - Selecting Database



1.2. If there is no existing database:

1.2.1. Select the **New Database** option (if not already selected).

Figure **35**. First Launch Set Up - Selecting Database



1.2.2.Click **Next**. The **Create New Database** dialog box will be displayed.

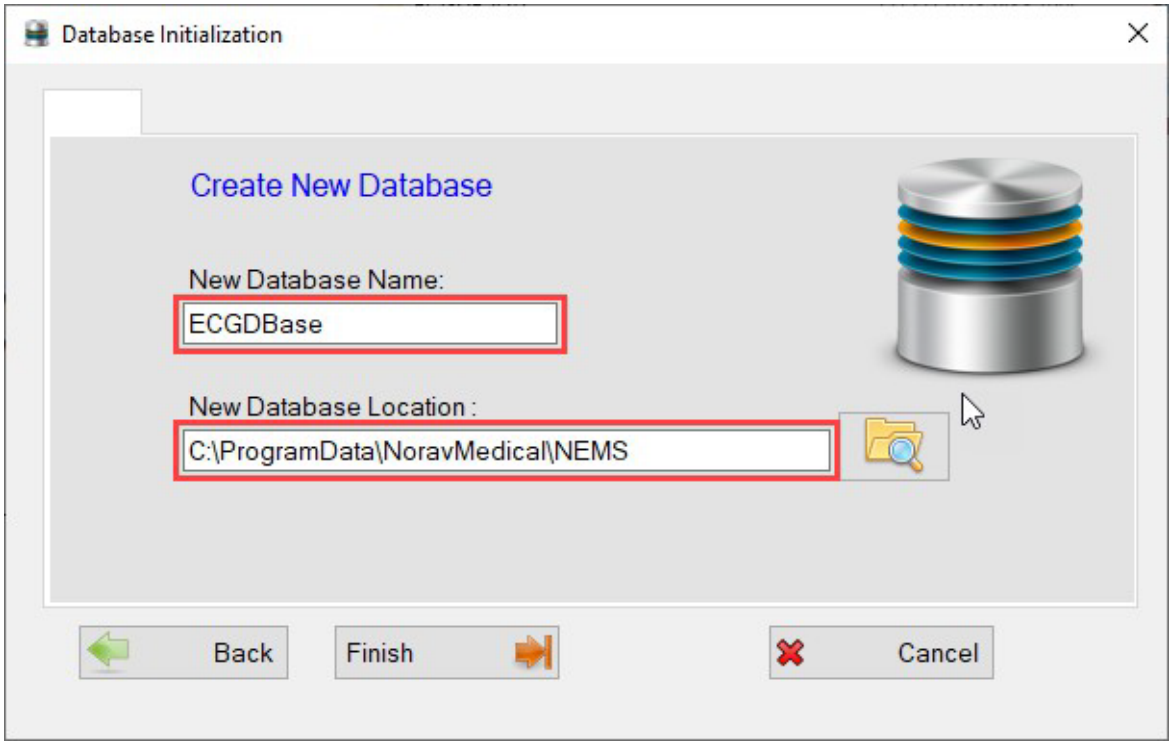


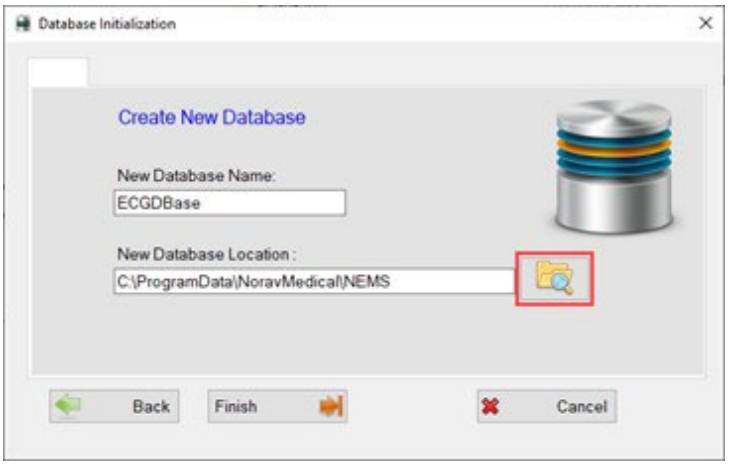
Figure **36**. First Launch Set Up - Create New Database Dialog Box

1.2.3. **(Optionally)** Click the **New Database Name** text field and modify the default database name manually.

1.2.4. **(Optionally)** To modify the default **New Database Location** path:

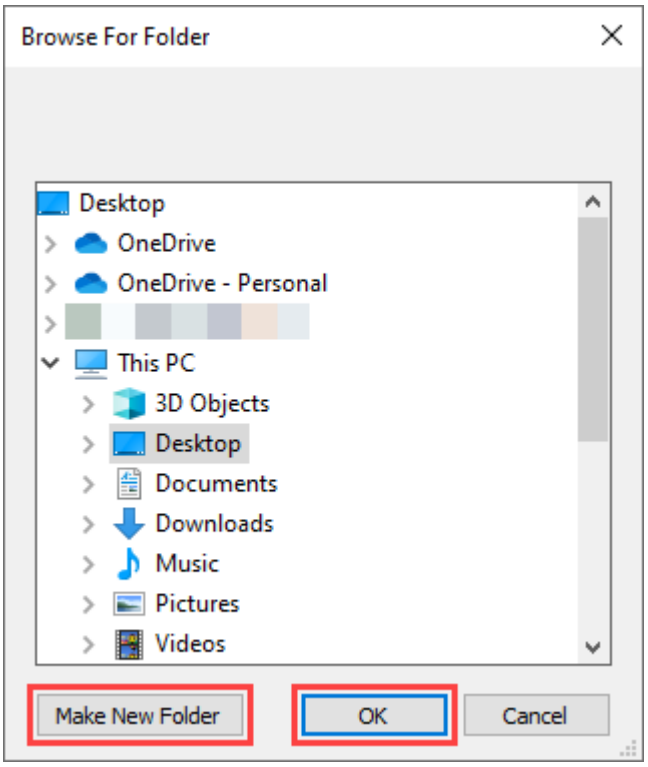
- Click the **New Database Location** text field and modify the default database location manually.
- Click the Search icon to the right of the **New Database Location** text field. The **Browse For Folder** dialog box is displayed:

Figure **37**. First Launch Set Up - Selecting Folder



1.2.4.1. Navigate to the location you need and choose a relevant folder.

Figure **38**. First Launch Set Up - Browse For Folder



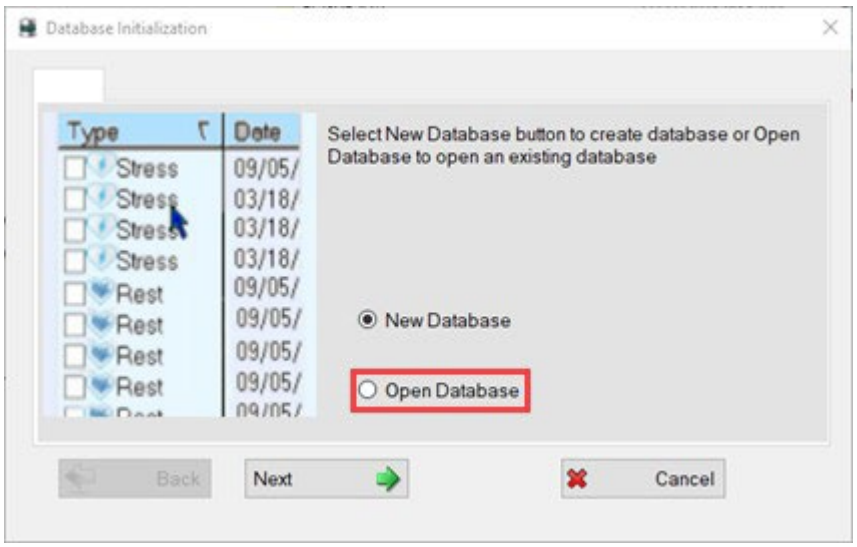
1.2.4.2. **(Optionally)** To create a new folder, click **Make New Folder** in the bottom-left corner of the dialog box and type in the folder name manually.

1.2.4.3. After you have selected the folder, click **OK** to confirm the new database location path. You will be redirected to the **Create New Database** dialog box.

1.3. **(Optionally)** If there is a database on your PC you want to connect to the NEMS-A application:

1.3.1. Select the **Open Database** option.

Figure **39**. First Launch Set Up - Open Database



1.3.2. Click **Next**. The **Open Database** dialog box is displayed.

1.3.3. **(Optionally)** To set or modify the path to the existing database you want to open:

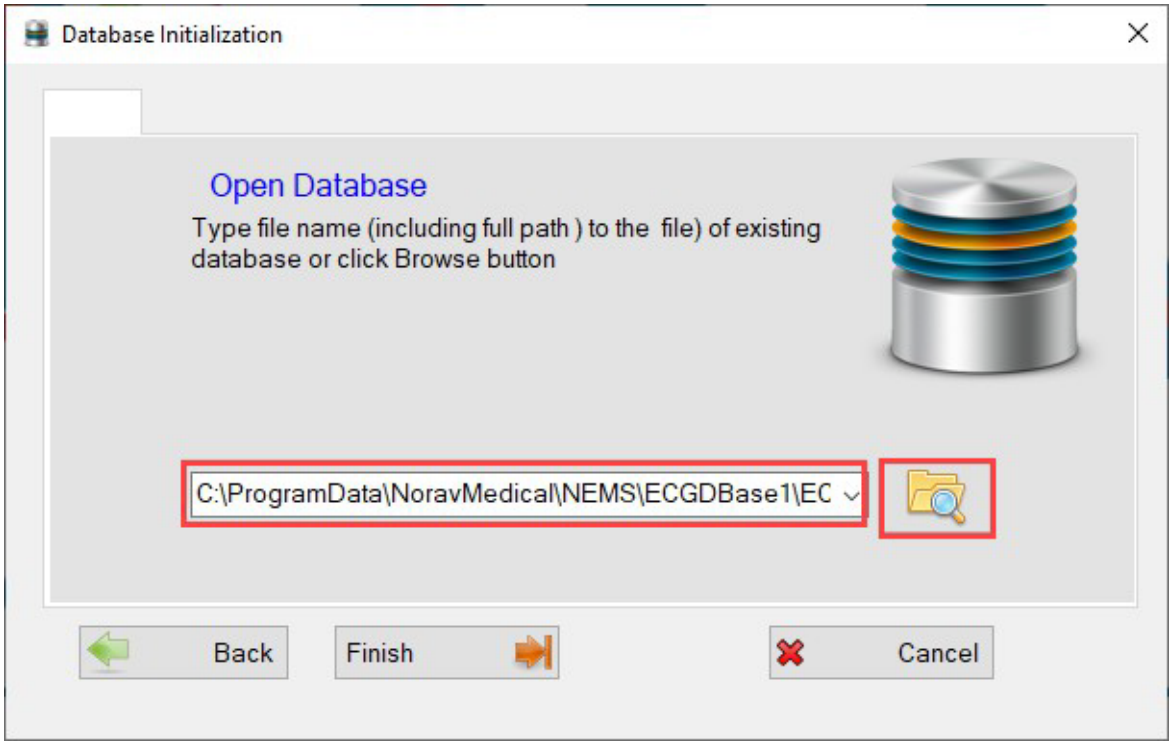
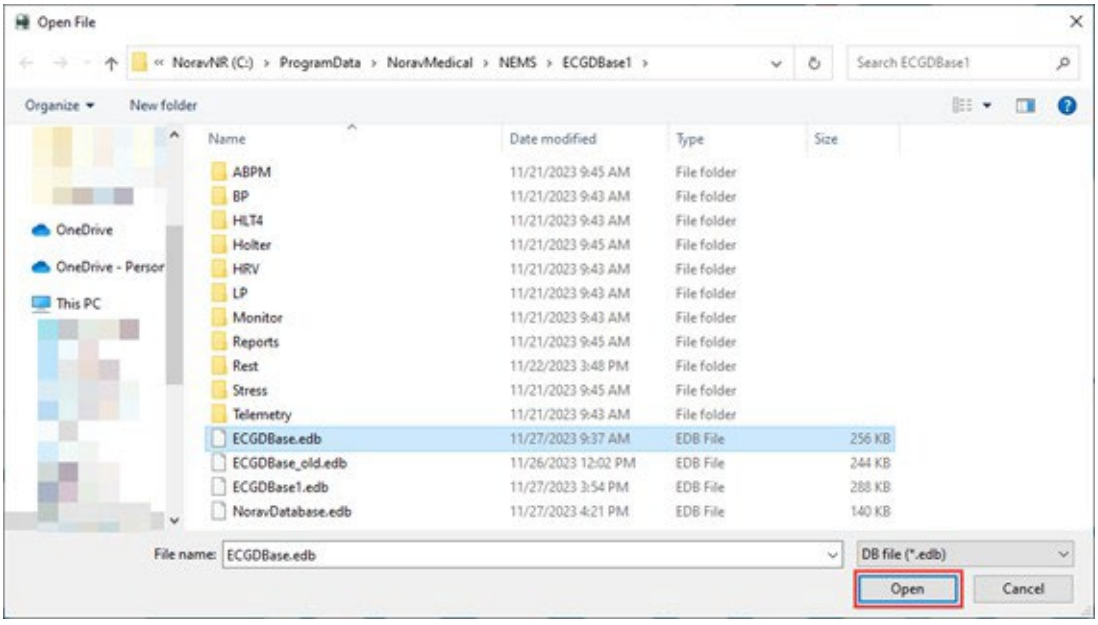


Figure **40**. First Launch Set Up - Open Database Dialog Box

- Click the text field and type in the full path (including the data base file name) to the existing database you want to open.
- Click the Search icon to the right of the text field. The **Open File** dialog box is displayed:

Figure **41**. First Launch Set Up - Open File Dialog Box



1.3.3.1. Navigate to the location where the existing database file is stored.
1.3.3.2. Select the database file (in .edb format).
1.3.3.3. Click **OK** to open the database file. You will be redirected to the **Open Database** dialog box.

1.4. Click **Finish.**

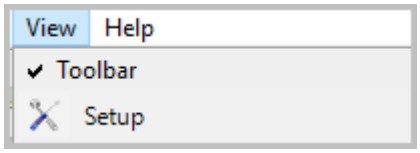
Figure **42**. First Launch Set Up - Click Finish

Additional **<Back** and **Cancel** buttons are available in the appropriate dialog boxes throughout the installation process. Click **<Back** to return to the previous dialog box. Click **Cancel** if you want to abort the installation process.

View Menu

The **View** menu contains the following options:

Figure **43**. Interface Overview - View Menu

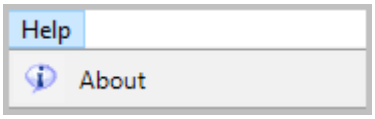


Icon	Description
	**Toolbar:** Click to toggle ON/OFF the **Main Toolbar** beneath the **Menu Bar**. Please refer to the Main Toolbar section for more details.
	**Setup**: Click to open the NEMS-A **Setup** dialog box containing multiple tabs with the application's general settings. Please refer to the Setup subsection for more details.

Help Menu

The **Help** menu contains the following options:

Figure **44**. Interface Overview - Help Menu



About: Click to view the **About** page, which contains the information on version of the NEMS-A installed on your PC and Norav Software Permissions. Permissions represent the list of permissions enabled by the specific license key you are using at the moment. Different permission types encoded with M1, H1, NM700, and similar codes are related to various Norav Software applications interconnected with the NEMS-A app.

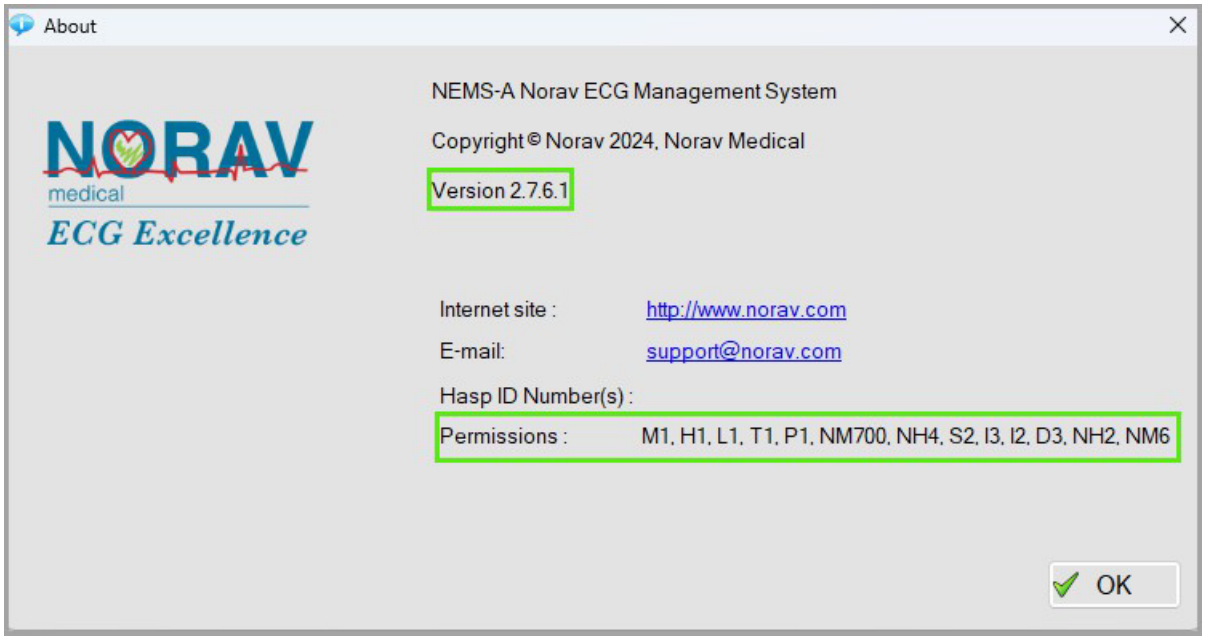


Figure **45**. Interface Overview - View Menu - About

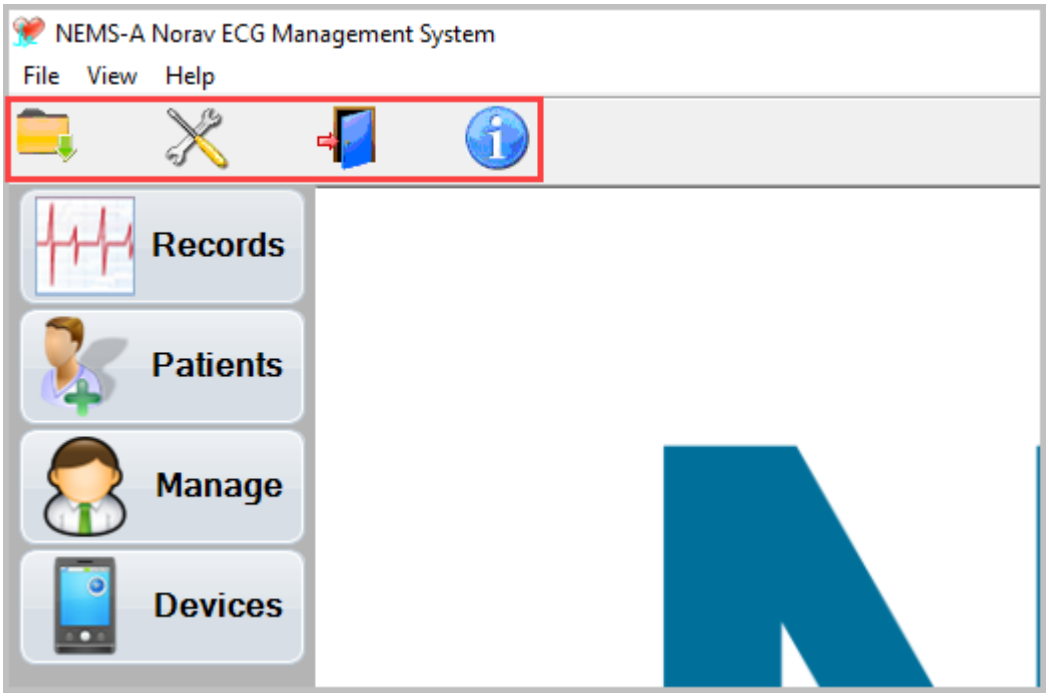
To close the **About** page, click **OK** in the bottom-right corner.

Note: You do not need any license keys to perform Blood Pressure (ABPM) tests using NEMS-A.

Main Toolbar

The **Main Toolbar** provides quick access to the most commonly used features also found within menus in the **Menu Bar**, such as importing records, setup menu, about the app feature, etc. A detailed description of the components can be found below.

Figure **46**. Interface Overview - **Main Toolbar**



The **Main Toolbar** includes four icons, representing the following features:

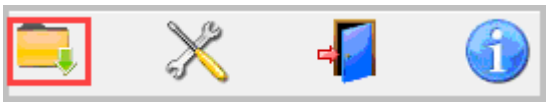
- **Import**
- **Setup**
- **Exit**
- **About**

Icon	Description
	**Import**: Click to import a record file supported by NEMS-A.
	**Setup**: Click to open the NEMS-A **Setup** dialog box containing multiple tabs with application general settings. Please refer to the Setup subsection) for more details.
	**Exit**: Click to exit NEMS-A and close the application.
	**About** Click to view the **About** page containing the version of the NEMS-A installed on your PC and Norav Software Per- missions. Permissions represent the list of permissions enabled by the specific license key you are using at the moment. Different permission types encoded with M1, H1, NM700, and similar codes are related to different Norav Software applications interconnected with the NEMS-A app. To close the **About** page, click **OK** in the bottom-right corner.

To import a record file:

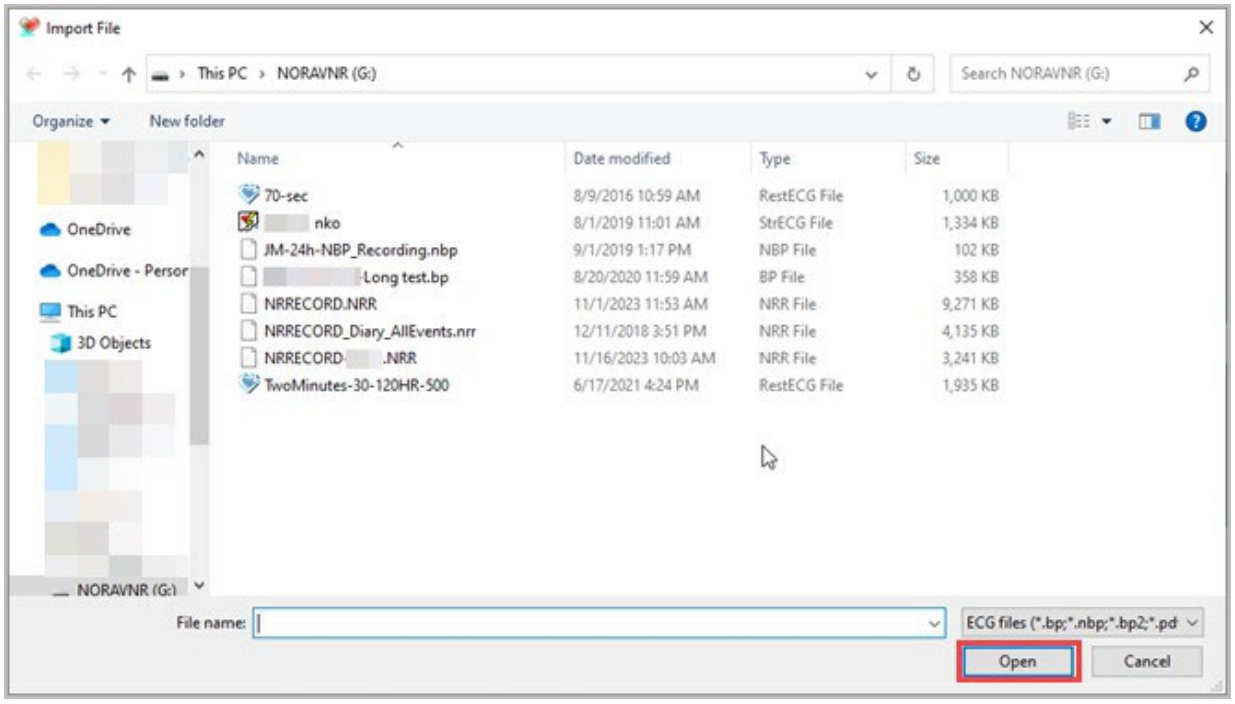
1. Click the **Import** icon in the **Main Toolbar** to open the **Import File** dialog box.

Figure **47**. Toolbar - Clicking Import



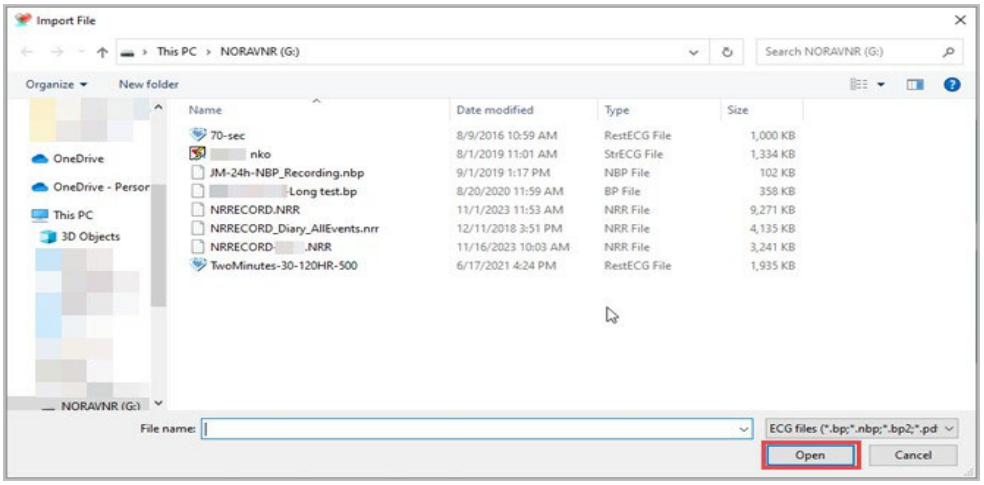
2. Navigate to the location with the files supported by NEMS-A that you want to import.

Figure **48**. File Menu - Import File Dialog Box



3. Select the file(s) you want to import:
   - Click an individual file to select it.
   - Select several files using one of these methods:
     - **Using Click-and-Drag:**
       3.1. Click any empty space in the Windows Explorer window, hold down the left mouse button, and drag your cursor over the files you want to select. This will create a selection box.
       3.2. Ensure that all files you wish to select are within the boundaries of this selection box.
       3.3. Release the mouse button to complete the selection.
     - **Using Ctrl + Click:**
       3.1. Click on the first file you want to select.
       3.2. Hold down the Ctrl key.
       3.3. While holding the Ctrl key, click on each additional file you want to select. Each clicked file will be added to your selection.
     - **Using Shift + Click:**
       3.1. Click on the first file in a series of files you want to select.
       3.2. Hold down the Shift key.
       3.3. Click on the last file. All files between the first and last file you clicked will be selected.
     - If you want to select all files in the given folder, click **Ctrl + A**.
4. Click **Open** in the bottom-right corner to import the file(s).

Figure **49**. File Menu - Importing Files



5. You will be prompted with the **Results** dialog box showing the process and outcomes of the importing. After the importing is complete, you will see the information on the following:

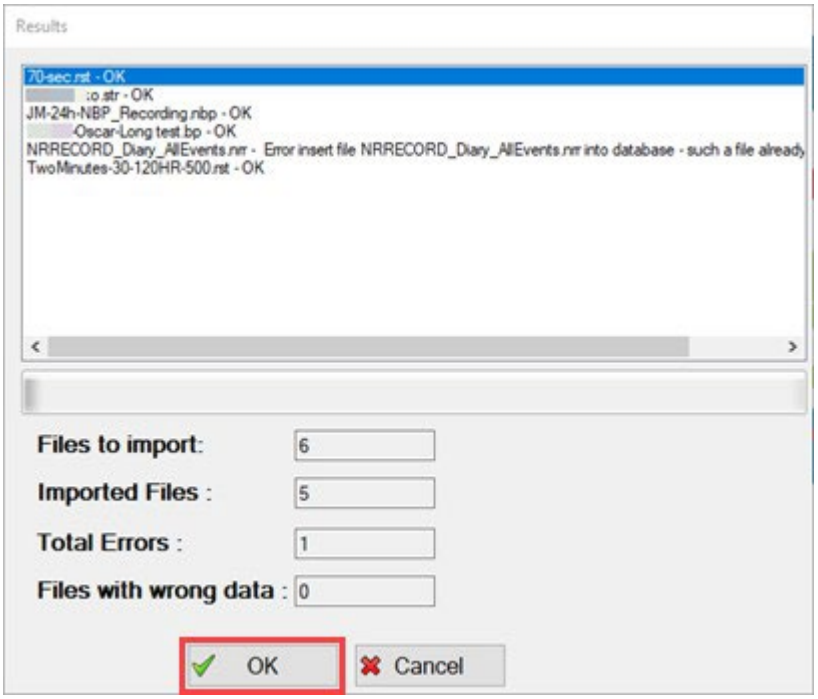


Figure **50**. File Menu - Results Dialog Box

- **Files to import:** The overall number of files you have selected for the import.
- **Imported files:** The number of files that were imported (no errors occurred).
- **Total errors:** The number of files that were not imported due to errors.
- **Files with wrong data:** The number of files that were validated as records with incorrect data.

6. Click **OK** to close the **Results** dialog box and finish the import, or click **Cancel** to abort.

NEMS-A supports the import of different types of test files.

File Type	Description
.bp	Oscar 2 Blood Pressure test file
.nbp	NBP One Blood Pressure test file
.bp2	NBP-24 NG Blood Pressure test file
.pdf	PDF file
.rst	Rest test file
.str	Stress test file
.hlt	Holter test file (NH-301 v.3.0.0 app)
.hl4	Holter test analyzed file (NH-301 v.3.0.0 app)
.hl5	Holter test analyzed file (NH-301 v.4.0.0 app and later)
.nrr	Holter test source file
.res	Holter source file
.mnt	Monitoring ECG test file
.lp	Late Potential test file
.hrv	Heart Rate Variability test file
.mnr	Telemetry File

Tabs

The **Tabs** are functional application screens with a designated **View Area**, enabling users to manage or perform certain actions with test records, patients, patient groups, medical personnel lists, and compatible devices. Each **Tab** focuses on one primary entity, such as test records or patient entries and provides a comprehensive set of tools to process them.

Figure **51**. Tabs - Tabs Panel

The NEMS-A application displays the following tabs in the tabs panel on the left:

- **Records**
- **Patients**
- **Manage**
- **Devices**

Icon	Description
	**Records Tab**: Click to navigate to this tab, enabling test records management, including viewing, reviewing, exporting, searching, sorting, etc.
	**Patients Tab**: Click to navigate to this tab, enabling patient management, includ ing adding new patients, editing, and deleting existing ones, preparing various devices to perform tests, etc.
	**Manage Tab**: Click to navigate to this tab, enabling the creation of user groups, as well as referring physicians, technicians, and reporting MDs lists.
	**Devices Tab**: Click to navigate to this tab, enabling the downloading of test records from Holter and ABPM devices (ECG and Blood Pressure recordings re- spectively). **Note:** You can connect only one device at a time to download a record. To prevent potential downloading errors, avoid connecting multiple de-vices during the records downloading step.

Note: When you navigate to the **Records** or **Patients** tab just after launching the application, you will notice that the View Area of those tabs lacks records or patient data, respectively. To populate it with records/patient data, choose any search criteria and click **Search**. It is recommended to check all three checkboxes for the **Gender** option (applicable to both the **Records** and the **Patients** tabs) and the **All** option under the **Test Date** (applicable to the **Records** tab only) to display all available data.

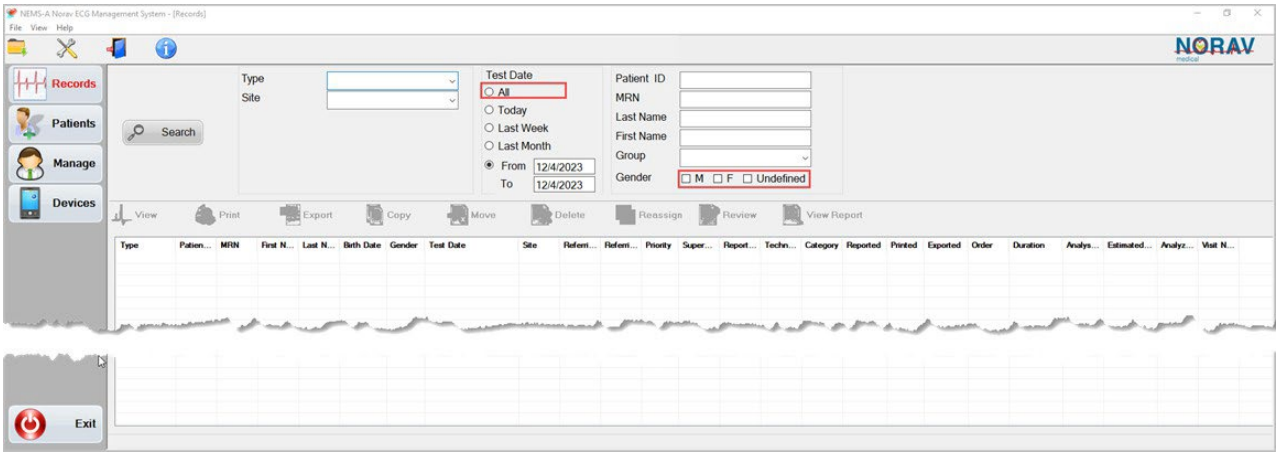


Figure **52**. Tabs - Records Tab Empty

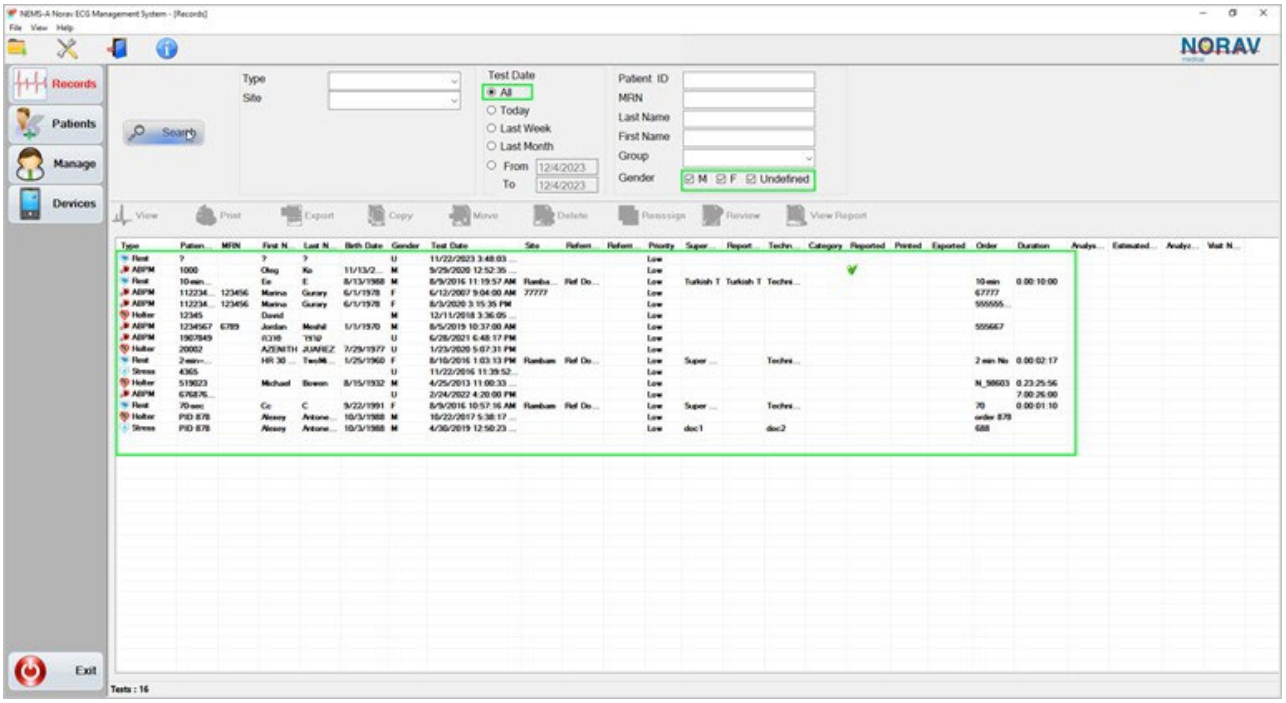


Figure **53**. Tabs - Records Tab Interface

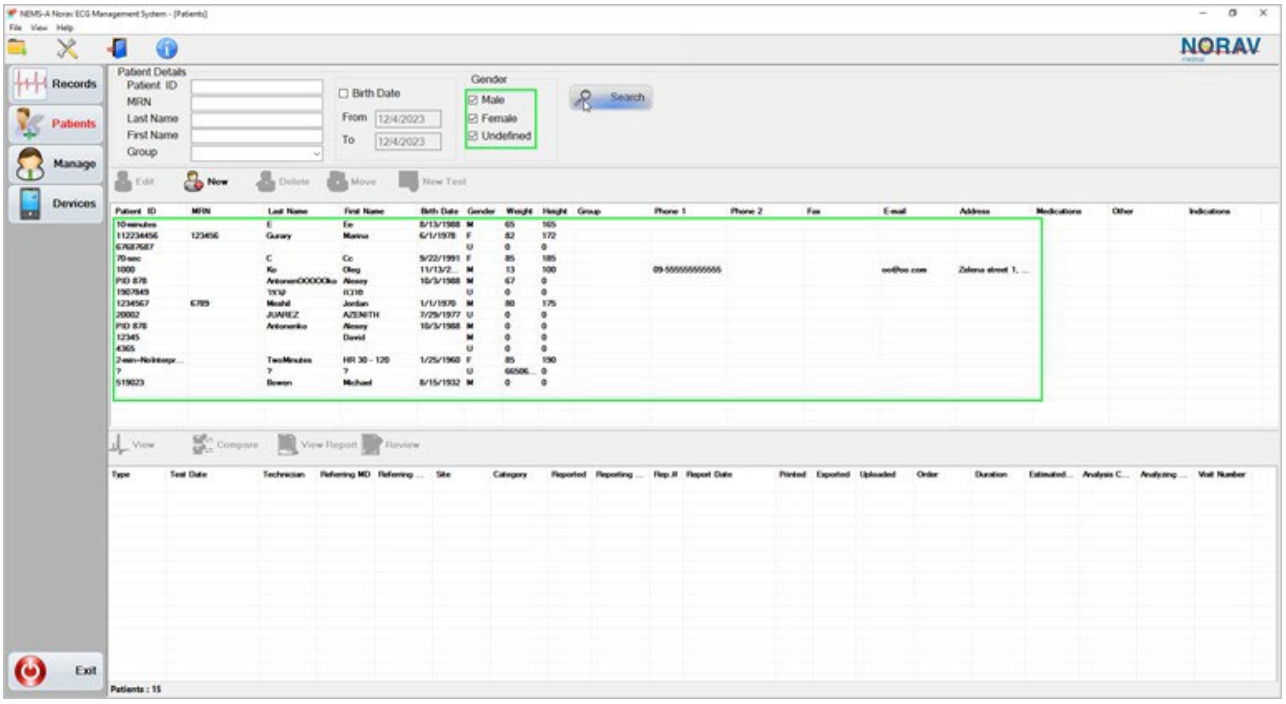


Figure **54**. Tabs - Patients Tab Interface

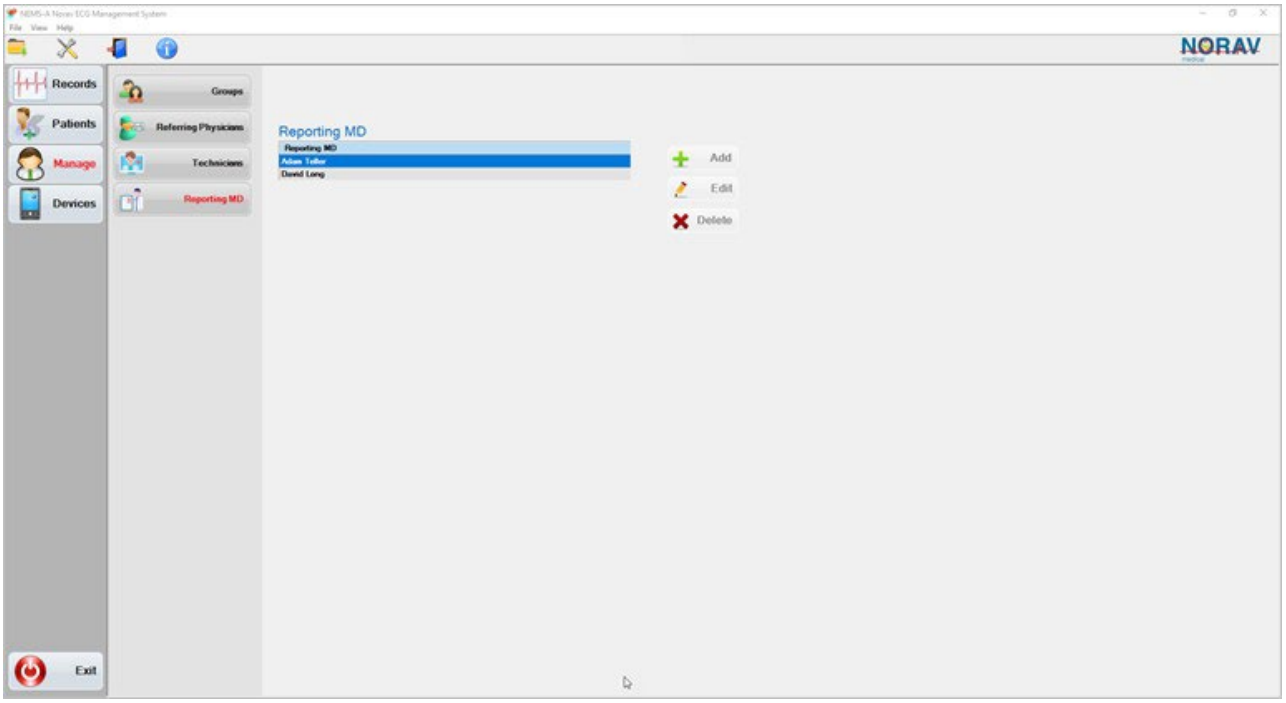


Figure **55**. Tabs - Manage Tab Interface

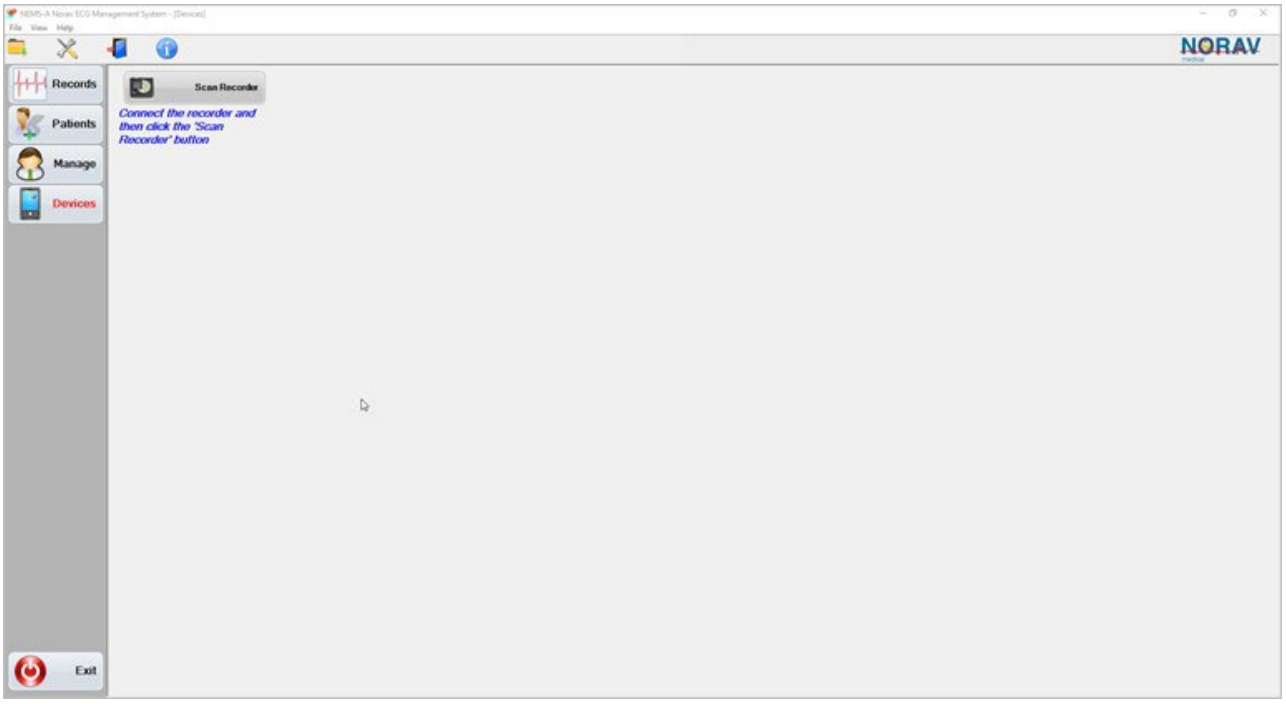
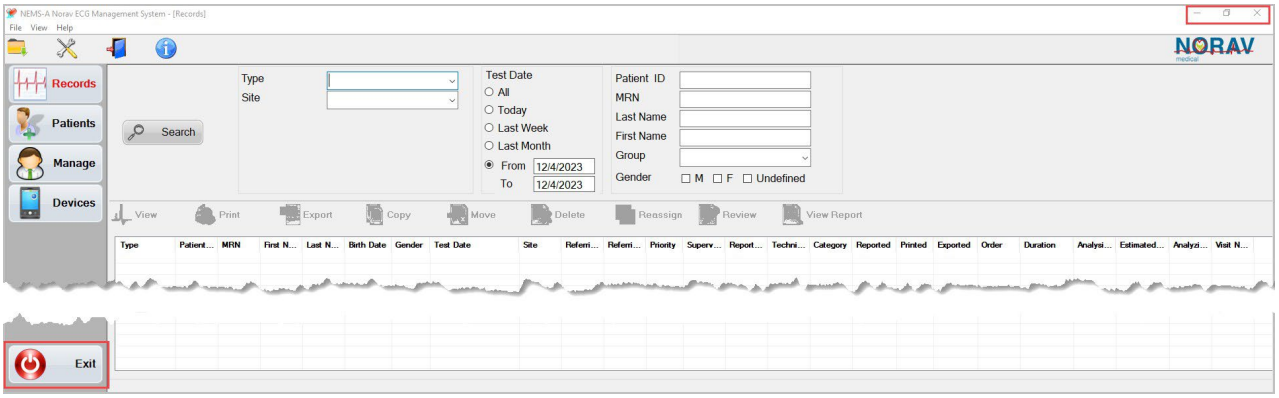


Figure **56**. Tabs - Devices Tab Interface

Window Control Buttons & Exit Button

The **Window Control Buttons** element includes the window's **Minimize**, **Restore/Maximize**, and **Close** buttons, and is located in the top right corner of the window. The **Exit** button is located in the left-bottom corner. These buttons enable you to customize the app window size according to your preferences, change the window mode, or close the program.

Figure **57**. Interface Elements Overview - Window Control Buttons and Exit Button



Minimize

Click this button to minimize the window to an icon on the taskbar. The window is still running in the background, but it is not visible.

Figure **58**. Window Control Buttons - Minimize

To restore the window, click on the program's icon on the Windows taskbar.

Restore/Maximize

Click this button to toggle between the maximized and restored states of a window. The maximized state is when a window fills the entire screen, and it cannot be resized or moved, though you can still see a title bar of the current window.

Figure **59**. Window Control Buttons - Restore or Maximize

The restored size of the window is the size you set by dragging the edges of the window with the mouse cursor. The restored state of the window is an in-between state, when the window is neither minimized nor maximized. You can freely resize and move the window in a restored state.

Close

Click this button to close the window and exit the application.

Figure **60**. Window Control Buttons - Close

Exit Button

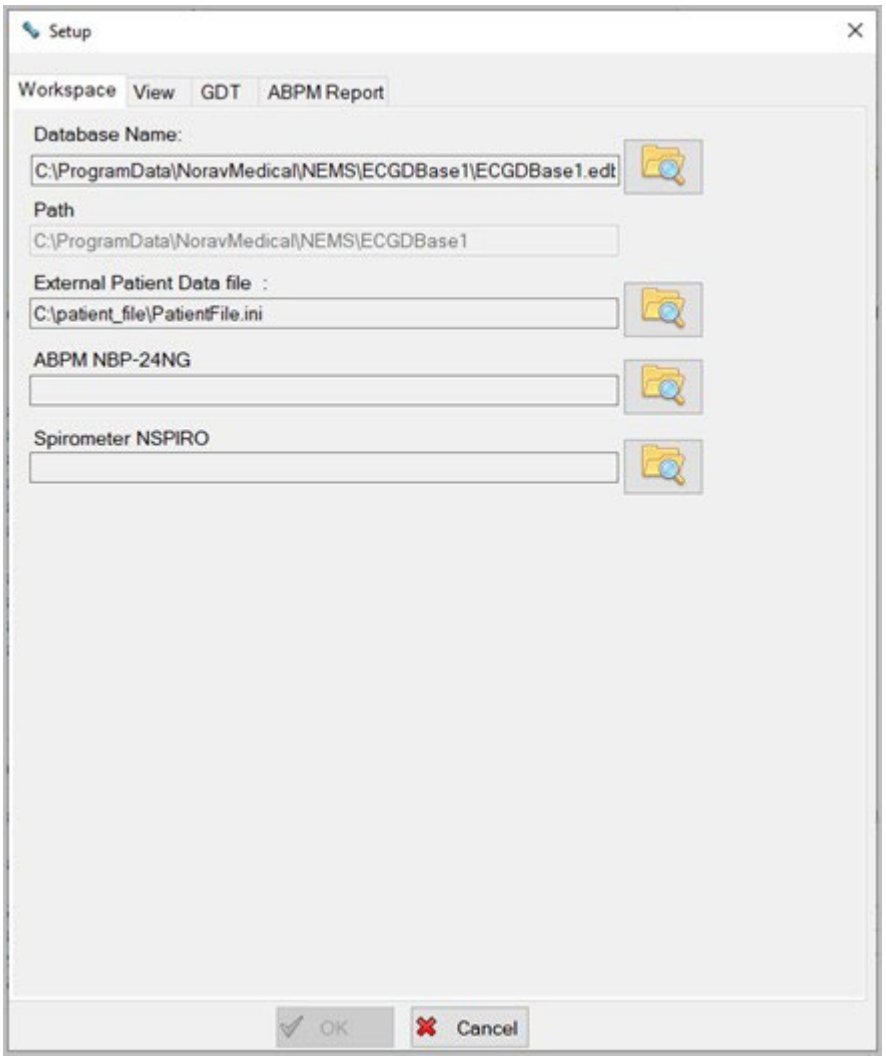
Click this button to close the window and exit the application. This button is similar to the **Close** button described above.

Figure **61**. Window Control Buttons - Exit Button

NEMS-A Setup Feature Overview

The **Setup** feature allows you to customize general application settings to suit your needs and workflows. The **Setup** dialog box consists of four tabs: **Workspace**, **View**, **GDT**, and **ABPM Report**. Within these tabs, you can manage and modify various settings, including the paths to the application's database and related test apps, the layout of tabs, the settings for data transfer format (GDT), and the layout of the blood pressure report. By adjusting these settings, you can change how the application interacts with specific test apps and performs related tests.

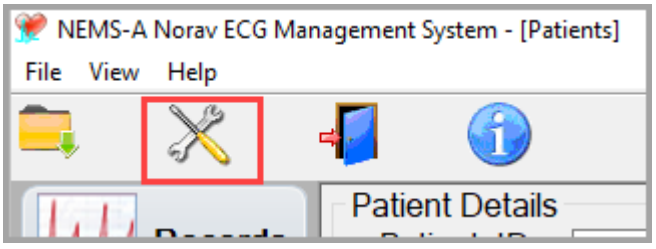
Figure **62**. Setup - Setup Dialog Box



To access the Setup dialog box, do one of the following:

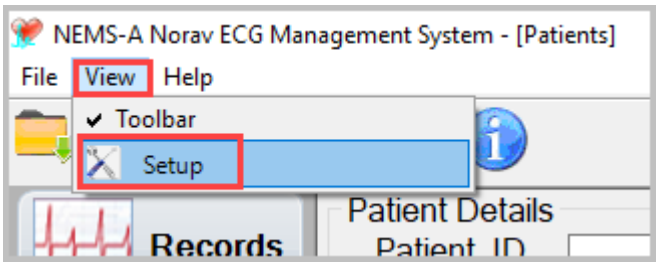
- Click the **Setup** icon in the **Main Toolbar**.

Figure **63**. Setup - Main Toolbar Setup Option



- Click the View menu in the Menu Bar in the top-left corner, then click Setup.

Figure **64**. Setup - View Menu Setup Option



After doing that, you will be prompted with the **Setup** dialog box containing the following tabs:

- **Workspace**
- **View**
- **GDT**
- **ABPM Report**

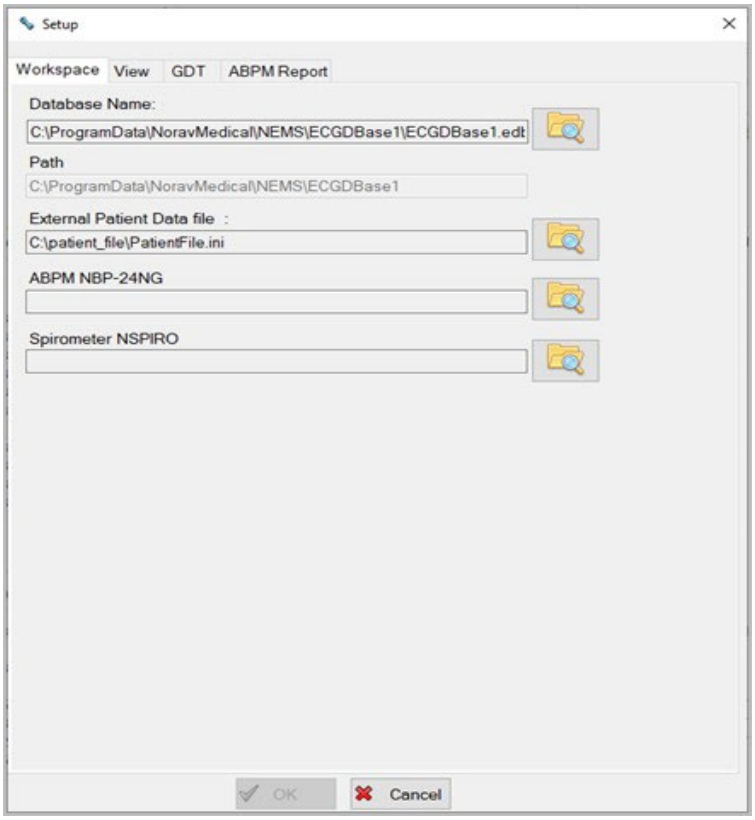


Figure **65**. Setup - Setup Dialog Box

Workspace Tab

The **Workspace** tab contains paths to various application assets:

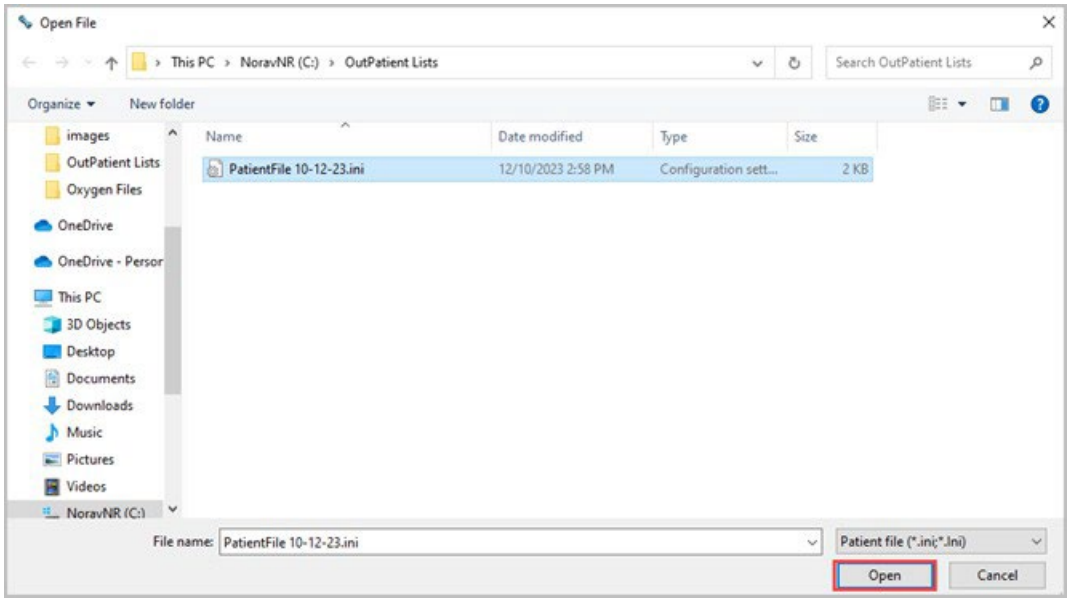
- Application database
- External patient data file
- Applications that perform relevant tests. The test data can be acquired, stored, and processed in the NEMS-A application after the test is successfully completed.

Setup Option	Description
Database Name	Contains the full path to the application's database, including the name of the .db database file. Here, you can modify the path to the database file, or load other database files, if needed. The same parameter is stored in the **Settings.xml** file on your PC in the following path: **C:\ProgramData\NoravMedical\NEMS**.
Path	Contains the full path to the default app folder. This folder contains test and report files, as well as the database file. You can't modify this field within the Setup dialog box.
External Patient Data file	Contains the full path to the **PatientFile.ini** file with the list of external patients. It houses common patient data. Using this file, a user can import external patient data to the NEMS-A (by creating a new patient entity or editing an existing one) to perform relevant tests. Here, you can modify the path to the external patient file, or load another file, if needed.
ABPM NBP-24NG	Contains the full path to the .exe file of the standalone Norav ABPM application. The modern NEMS-A application embeds all ABPM capabilities, but a standalone ABPM application can be added using a full path. This is beneficial for users already utilizing the Norav ABPM NBP-24NG application with existing settings and patient lists, or for new users who prefer to maintain all data within the ABPM app. Here, you can modify the path to the desired application.
Spirometer NSPIRO	You can add a full path to the .exe file of the compatible NSPIRO Spirometer application. After adding the path, you will be able to initiate spirometer tests directly from the NEMS-A app. You can also modify the path to the relevant application, using this option.

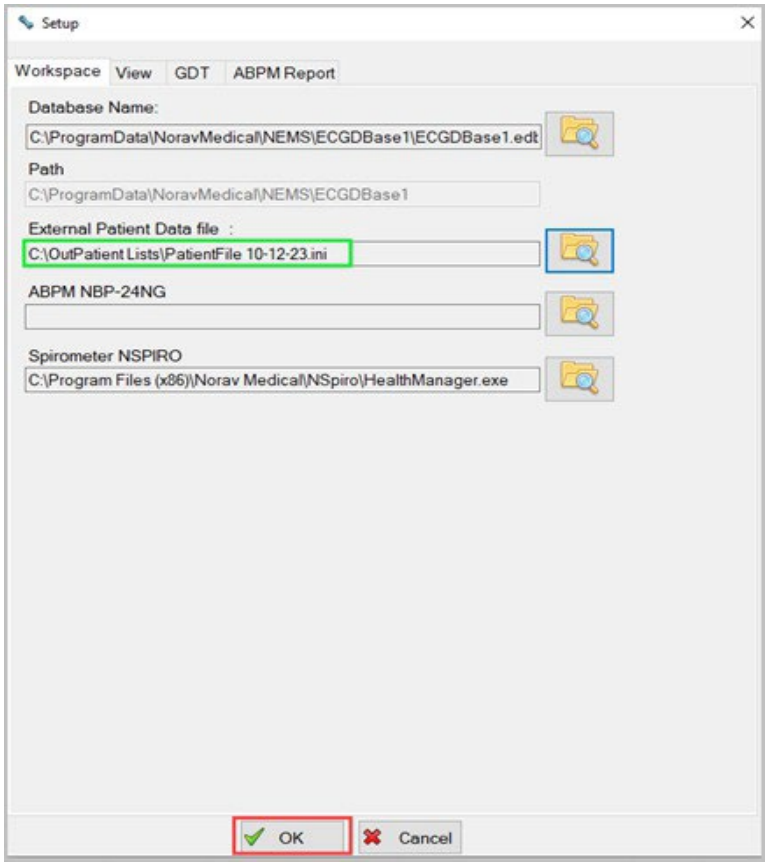
The method for changing the path for any of the options listed above follows a single logic and sequence. In the example below, we will open (load) a new **External Patient Data** file:

1. Click the **Search** icon to the right of the text box. The **Open File** dialog box is displayed.
2. Navigate to the location where the file you want to load (open) is stored.
3. Select the file (an .ini file in this case).

Figure **66**. Setup - Opening File



4. Click **Open** to open the file. You will be redirected to the **Setup** dialog box. You will see a new path in the relevant text box.
   Figure **67**. Setup - Applying Changes



5. Click **OK** in the bottom part of the **Setup** dialog box to apply the changes.

Note: After opening a new **External Patient Data File**, the process to import new patient data involves specific steps:

1. Click on the **Patients** tab.
2. Select **New > External** (or **Edit > External**).
3. Choose the desired patient in a dialog box.
4. Click **Select**.
5. Click **OK**.

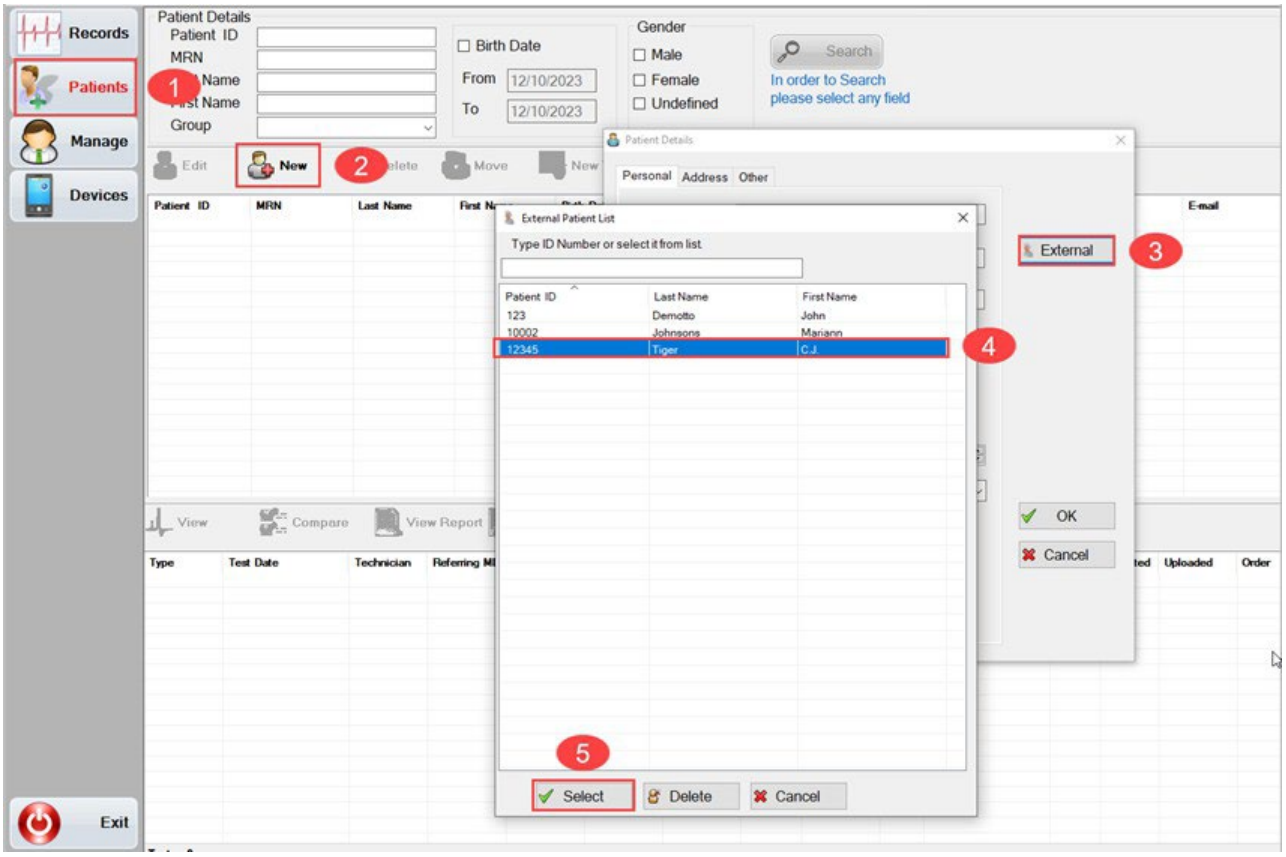


Figure **68**. Setup - Adding External Patients

View Tab

The **View** tab comprises three sub-tabs, each with specific setting parameters:

- **General**
- **Records**
- **Patients**

Figure **69**. Setup - View Tab

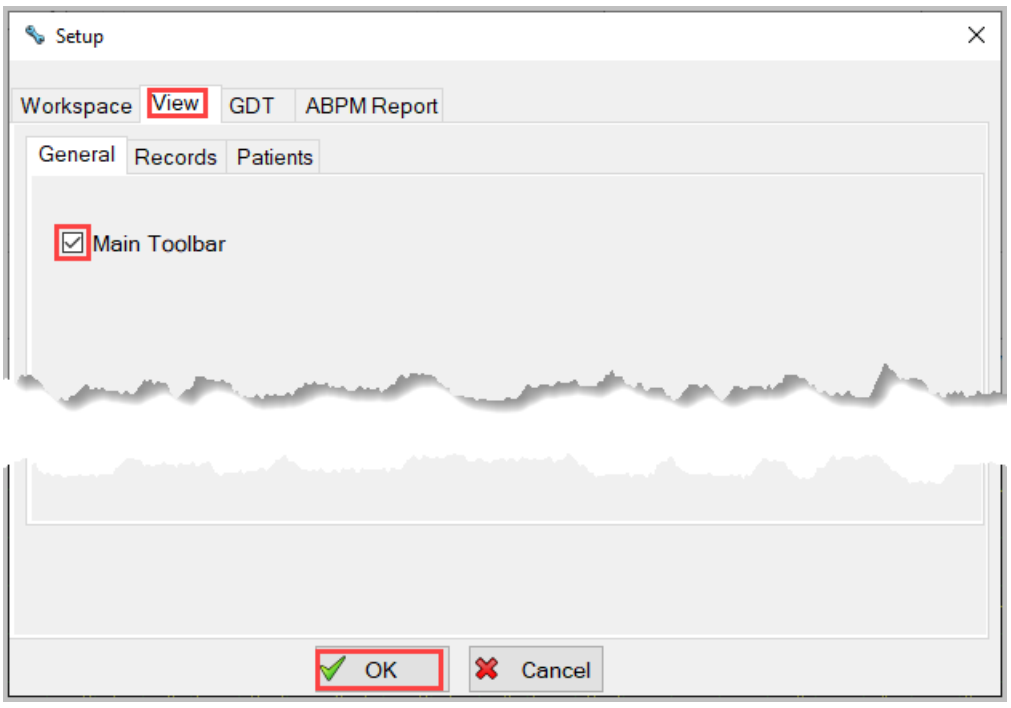
General

The **General** tab offers the **Main Toolbar** option, allowing toggling the **Main Toolbar** element of the NEMS-A application ON or OFF.

To toggle the **Main Toolbar** ON or OFF:

1. Click the **Setup** option in the **Main Toolbar** or in the **View** menu of the **Menu Bar**.
2. Click the **View** tab.

Figure **70**. Setup - View Tab Toolbar Option



3. Click the checkbox beside the **Main Toolbar** option.
4. Click **OK** at the bottom of the dialog box.

5. Restart the application to apply the changes.

Repeat this sequence whenever you need to switch the **Main Toolbar** ON or OFF.

Records

The **Records** tab enables users to customize the layout of the **Records** screen. It offers a flexible interface for selecting and organizing fields related to records. This feature allows users to arrange columns in their preferred order, including fields like **Patient ID**, **First Name**, **Last Name**, **Test Date**, and others. Additionally, it allows users to adjust the visualization of ECG example strips associated with Rest-type records.

Figure **71**. Setup - View Tab - Records Tab

Under the **Define Fields** option, you can configure common patient data fields for each patient record and the sequence of their appearance for each entry in the **Records** tab.

To select which columns to display in the **Records** tab and arrange the layout:

1. Click on the **Records** option under the **Define Fields** option. This will open the **Column Selection** dialog box.

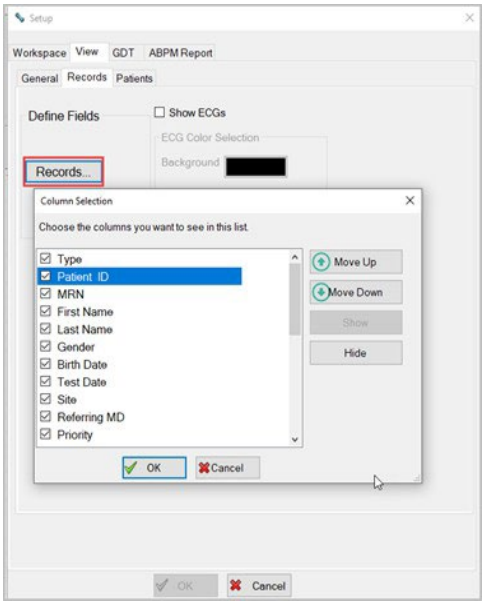


Figure **72**. Setup - View Tab - Clicking Records

2. **(Optional)** To toggle any of the 25 available columns ON/OFF, excluding the **Type** column:
   - Click a checkbox next to the relevant column name (e.g., **Patient ID**, **First Name**, **Test Date**) to toggle it ON or OFF.
   - Select a column to toggle ON/OFF and click the **Show** or **Hide** button on the right to display or hide this column.
3. **(Optional)** To move a column forward (up in the list) or backward (down in the list) in the records list:
   - Select a column to move and click **Move Up** on the right to shift it one position up in the dialog box and forward in the records list. This action can be repeated multiple times.
   - Select a column to move and click **Move Down** to shift it one position down in the dialog box and backward in the records list. This action can be repeated multiple times.
4. Click **OK** to save the changes.
5. Click **OK** to apply the changes.

Note: The **Type** column cannot be turned off as it contains data about the test type. You can only change the position of this column using the **Move Up** and **Move Down** buttons in the **Column Selection** dialog box.

The **Column Selection** dialog box, located in the **Records** tab, provides a selection of 25 columns that can be displayed and arranged according to your preferences.

Column Name	Description
Type	Type of the test.
Patient ID	Patient ID stored in the system.
MRN	**Medical Record Number**: A unique identifier for each patient's medical record.
First Name	Patient's First Name.
Last Name	Patient's Last Name.

Gender	Patient's Gender.
Birth Date	Patient's Birth Date.
Test Date	The date on which the test was performed and the record was created.
Site	Location where the test was conducted (e.g., medical facility name).
Referring MD	The physician who requested the test.
Referring Dept	The department or clinic issuing the test order.
Priority	Indicates the urgency of the test and interpretation.
Supervising MD	The physician overseeing the reporting MD's work.
Reporting MD	The physician analyzing the ECG data and providing a report.
Technician	The healthcare professional performing the ECG test.
Order	Test identification number (data).
Duration	Duration of the test.
Analysis Center	The laboratory or department analyzing test data and generating a report.
Analyzing Technician	The technician reviewing and analyzing ECG data.
Category	Classifies the test category.
Estimated Duration	Estimated duration of the test.
Exported	Green checkmark indicating record export.
Printed	Green checkmark indicating record printing.
Reported	Green checkmark indicating report generation.
Visit Number	Unique identifier for each patient visit.
Uploaded	Not in use in this version of the app (turned OFF by default).

Under the **Show ECGs** option, you can customize how ECG waveforms are shown for Rest ECG records and choose whether to include ABPM test example strips with a patient's record.

To display example strips in the Rest ECGs and ABPM records:

1. Check the **Show ECGs** checkbox.
2. Click **OK** to save the changes.

In the **ECG Color Selection** section, you can click on the available options to change the color scheme of the ECG example strips using the generic color box.

In the **Strip Lead** section, located right below the **ECG Color Selection** section, you can choose a specific ECG channel to display in the aforementioned ECG example strips associated with patients' records.

To select or change the displayed ECG channel:

1. Click the radio button next to the channel you want to display.
2. Click **OK** to save the changes.

Patients

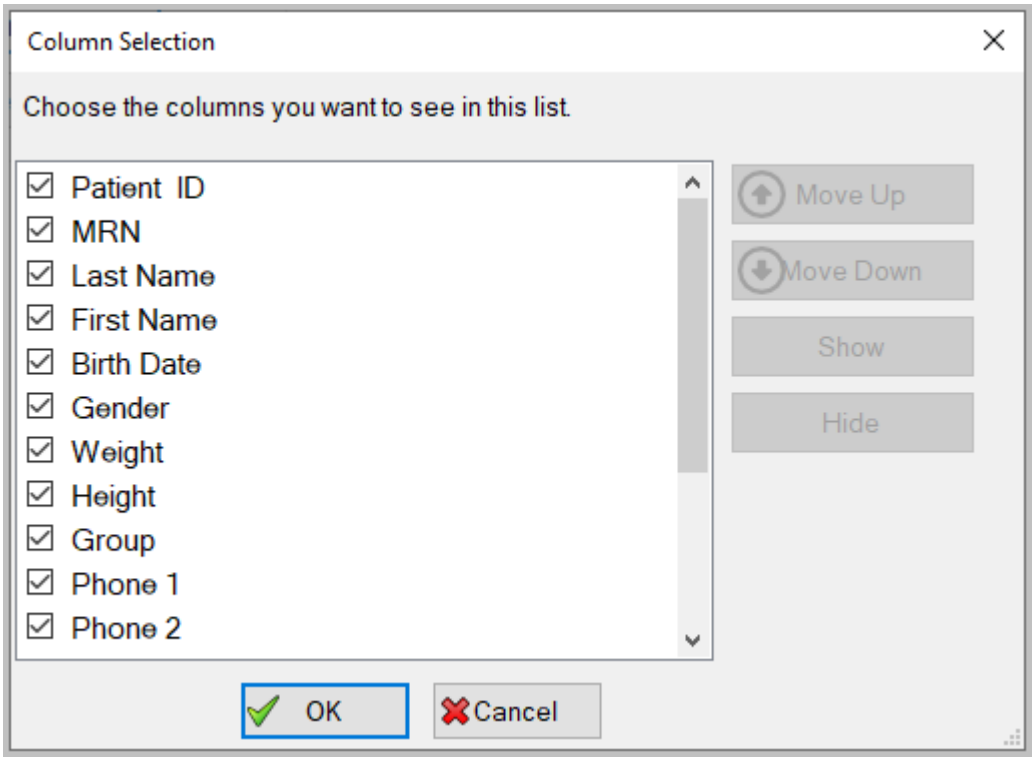
The **Patients** tab enables users to modify the layout of the **Patients** screen, which includes the **Tests** view at the bottom. This functionality allows users to tailor patient-related information to suit their individual requirements and work processes. Users can organize columns in the **Patients** screen in the sequence they prefer.

Within the **Define Fields** option, users can set up the standard data fields for patients in the **Patients** view and specify their display order. Users can also set up the data fields for the **Tests** view.

To select which columns to display in the **Patients** view and arrange the layout, follow these steps:

1. Click on **Patients** under the **Define Fields** option. This will open the **Column Selection** dialog box.

   Figure **73**. Setup - View Tab - Patients - Patients Dialog Box



2. **(Optional)** To toggle any of the available columns ON/OFF, excluding the **Patient ID** column:

Note: The **Patient ID** is the main patient's identification and tracking parameter, so the column cannot be turned OFF. You can only change the position of this column using the **Move Up** and **Move Down** buttons in the **Column Selection** dialog box.

   - Click a checkbox next to the relevant column name (e.g., **Patient ID**, **First Name**, **Weight**) to toggle it ON or OFF.
   - Select a column to toggle ON/OFF and click the **Show** or **Hide** button on the right to display or hide this column.

3. **(Optional)** To move a column forward (up in the list) or backward (down in the list) in the patients list:
   - Select a column to move and click **Move Up** on the right to shift it one position up in the dialog box and forward in the patients list. This action can be repeated multiple times.

- Select a column to move and click **Move Down** to shift it one position down in the dialog box and backward in the patients list. This action can be repeated multiple times.

4. Click **OK** to save the changes.
5. Click **OK** to apply the changes.

The **Column Selection** dialog box of the **Patients** view offers a number of columns similar to those you can find in the Column Selection dialog box of the Records tab. Below, you can find a list of unique columns associated with the **Patients** view.

Column Name	Description
Weight	Patient's weight.
Height	Patient's height.
Group	A designated group that can be assigned to a specific patient. Users can create groups and add patients to effectively manage them.
Phone 1	Patient's primary phone number.
Phone 2	An alternative phone number for the patient, such as a work or mobile number.
Fax	Patient's fax number, if applicable.
E-mail	Patient's email address.
Address	Patient's mailing address.
Medications	Information about the patient's current medications.
Other	This field can be used to store any additional patient-related information not covered by other fields. Examples might include emergency contact information, preferred language, allergies, or insurance provider details.
Indications	Reason(s) for the patient's visit or referral.

To select which columns to display in the **Tests** view and arrange the layout:

1. Click **Tests** under the **Define Fields** option. The **Column Selection** dialog box will appear.

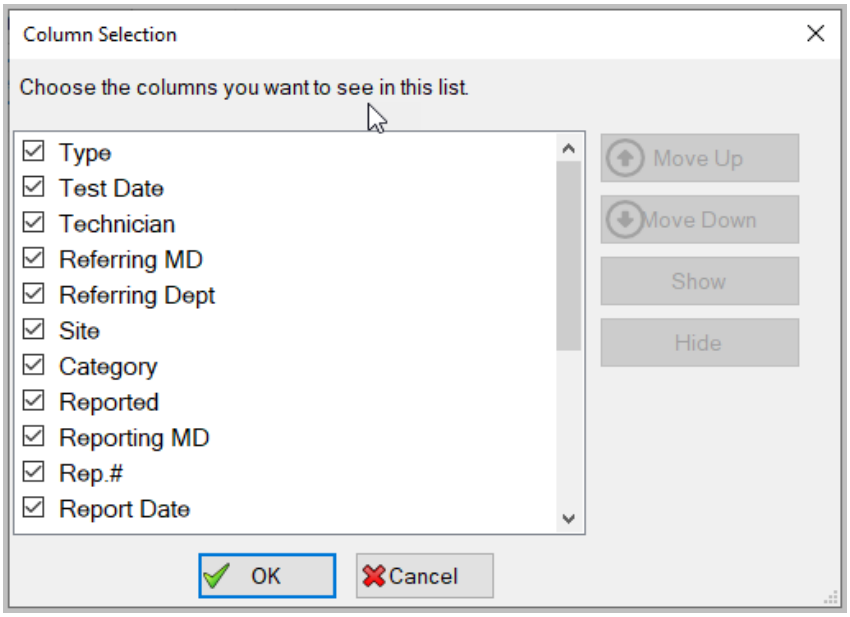


Figure **74**. Setup - View Tab - Patients - Tests Dialog Box

2. **(Optional)** To toggle any of the available columns ON/OFF, excluding the **Type** column:

Note: The **Type** column cannot be turned off as it contains data about the test type. You can only change the position of this column using the **Move Up** and **Move Down** buttons in the **Column Selection** dialog box.

   - Click a checkbox next to the relevant column name (e.g., **Patient ID**, **First Name**, **Weight**) to toggle it ON or OFF.
   - Select a column to toggle ON/OFF and click the **Show** or **Hide** button on the right to display or hide this column.
3. **(Optional)** To move a column forward (up in the list) or backward (down in the list) in the patients list:
   - Select a column to move and click **Move Up** on the right to shift it one position up in the dialog box and forward in the patients list. This action can be repeated multiple times.
   - Select a column to move and click **Move Down** to shift it one position down in the dialog box and backward in the patients list. This action can be repeated multiple times.
4. Click **OK** to save the changes.
5. Click **OK** to apply the changes.

Column Name	Description
Type	Type of the test.
Test Date	The date on which the test was performed and the record was created.
Technician	The healthcare professional performing the ECG test.
Referring MD	The physician who ordered the test.
Referring Dept	The department or clinic issuing the test order.
Site	Location where the test was conducted (e.g., medical facility name).
Category	Classifies the test category.
Reported	Green checkmark indicating report generation.
Reporting MD	The physician analyzing the ECG data and providing a report.
Rep. #	Report number.
Report Date	The date when the report was generated.
Printed	Green checkmark indicating record printing.
Exported	Green checkmark indicating record export.
Uploaded	Not in use in this version of the app (turned OFF by default).
Order	Test identification number (data).
Duration	Duration of the test.
Estimated Duration	Estimated duration of the test.
Analysis Center	The laboratory or department analyzing test data and generating a report.
Analyzing Technician	The technician reviewing and analyzing ECG data.
Visit Number	Unique identifier for each patient visit.

GDT Tab

GDT is a communication protocol between the entity that orders the test and NEMS-A, which transfers the test results file generated by NEMS-A. The entity that orders the test places a file containing patient details and test type in a specific location. NEMS-A reads this file and displays the information onscreen. The user then performs the test. After the test is completed, the test results file is created and sent to the entity that ordered the test. The **GDT** tab includes the following options:

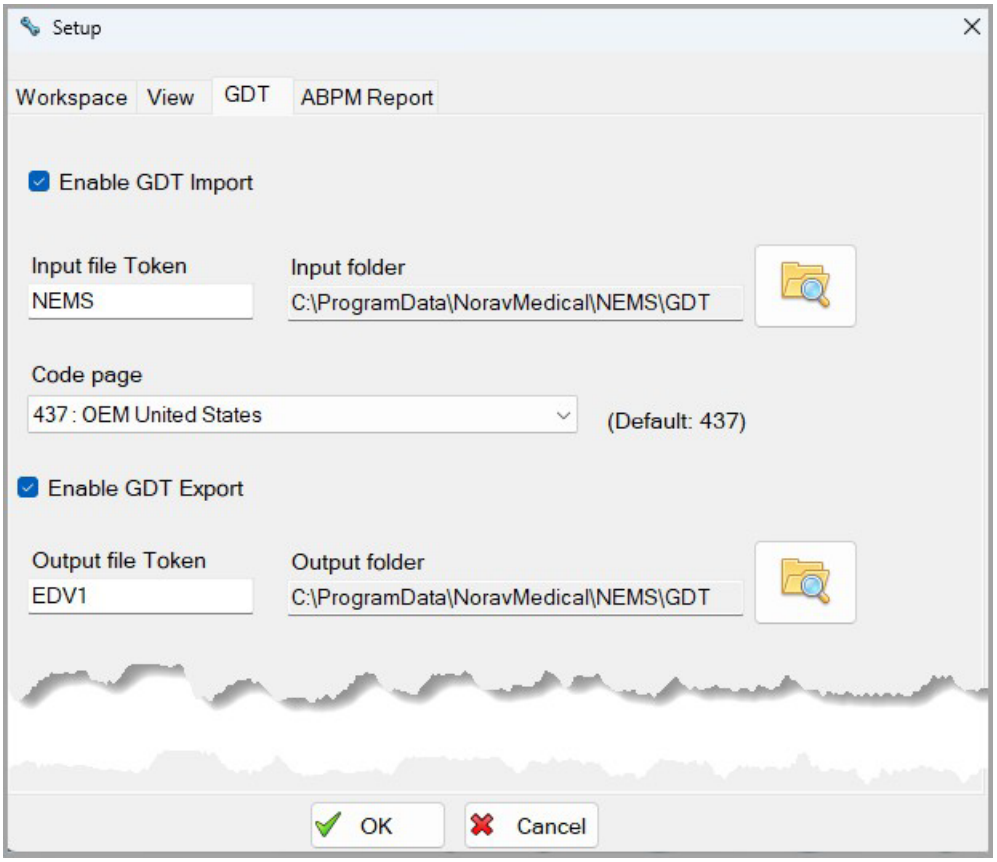


Figure **75**. Setup - GDT Tab

Option	Description
Enable GDT Import	Click the checkbox to turn ON/OFF GDT files import. Checked by default.
Input file Token	A prefix consisting of four characters in the filename to indicate that this GDT file is an inbound file either generated by EMR or placed into the inbound folder manually. By default, the value of this option is set to: **NEMS**.
Input folder	A path to the folder for GDT files to be imported into NEMS-A. By default, the value of this option is set to: C:\ProgramData\NoravMedical\NEMS\GDT
Code page	Select a character encoding standard (code page) relevant to your PC's country and language settings.
Enable GDT Export	Click the checkbox to turn ON/OFF GDT reports export from NEMS-A to the dedicated folder or EMR (NBP-24 NG reports only). Checked by default.
Output file Token	A prefix consisting of four characters in the filename to indicate that this GDT report file is generated by NEMS-A. By default, the value of this option is set to: **EDV1**.
Output folder	A path to the output folder for placing GDT report files generated by NEMS-A. By default, the value of this option is set to: C:\ProgramData\NoravMedical\NEMS\GDT

To change the **Input file Token** or **Output file Token** option value:

1. Click a relevant text field.
2. Adjust the existing token or type in a new token (prefix) manually.
3. Click **OK** to apply the changes.

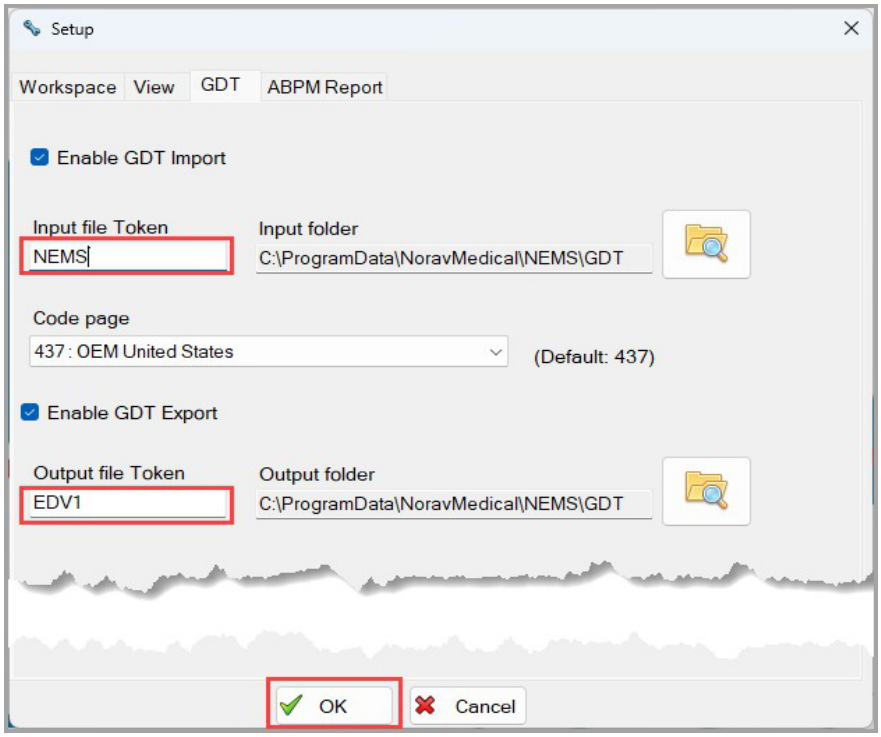


Figure **76**. Setup - GDT Tab - Input and Output File Tokens

To change the **Code page**:

1. Click the **Code page** drop-down menu to unfold it.
2. Select the code page you need.
3. Click **OK** to apply the changes.

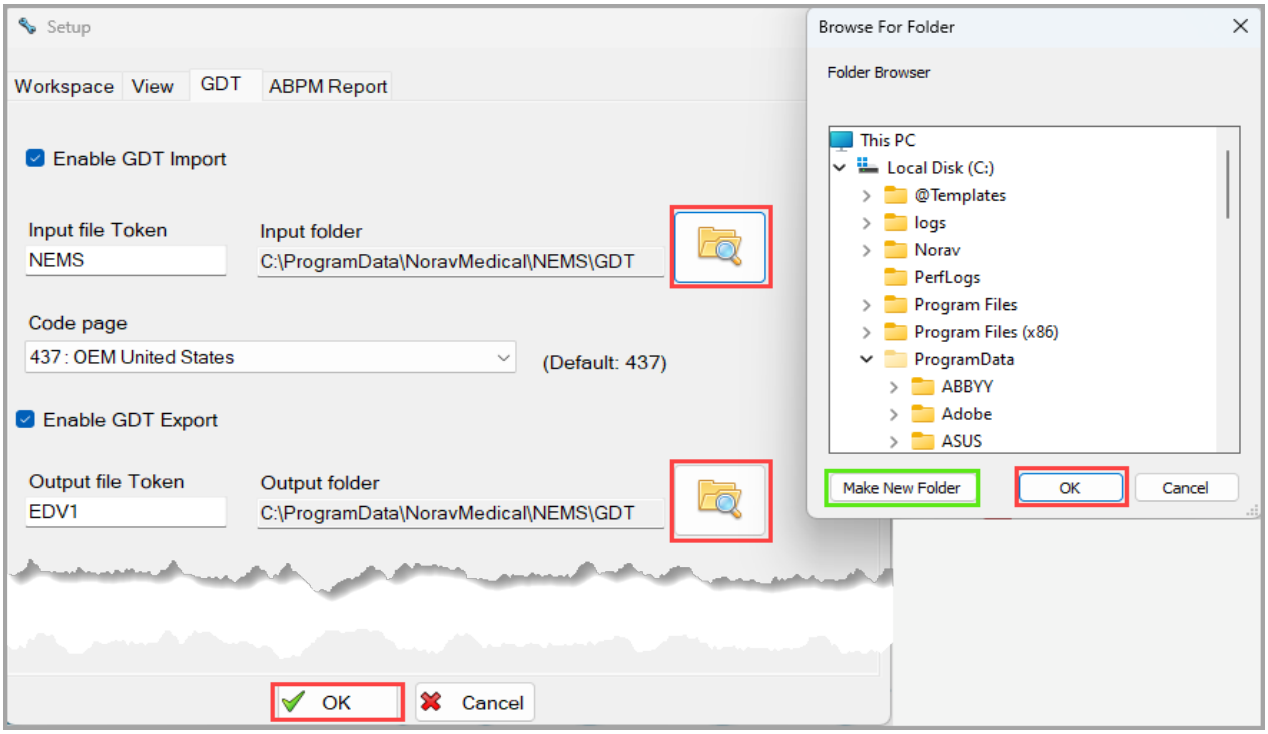


Figure **77**. Setup - GDT Tab - Input and Output Folders

To change the **Input folder** or **Output folder** path:

1. Click the **Search** icon. The **Browse For Folder** dialog box will be displayed.
2. Navigate to the relevant folder or click **Make New Folder** to create a new one.
3. Select the desired folder.
4. Click **OK** to apply the changes.

ABPM Report Tab

The **ABPM Report** tab contains options enabling layout adjustments for this specific type of reports in NEMS-A:

- **Date Format**
- **Header Alignment**

Date Format

The **Date Format** option determines how the date and time will be presented in the ABPM test record. It offers a set of date and time formats to choose from, as shown below.

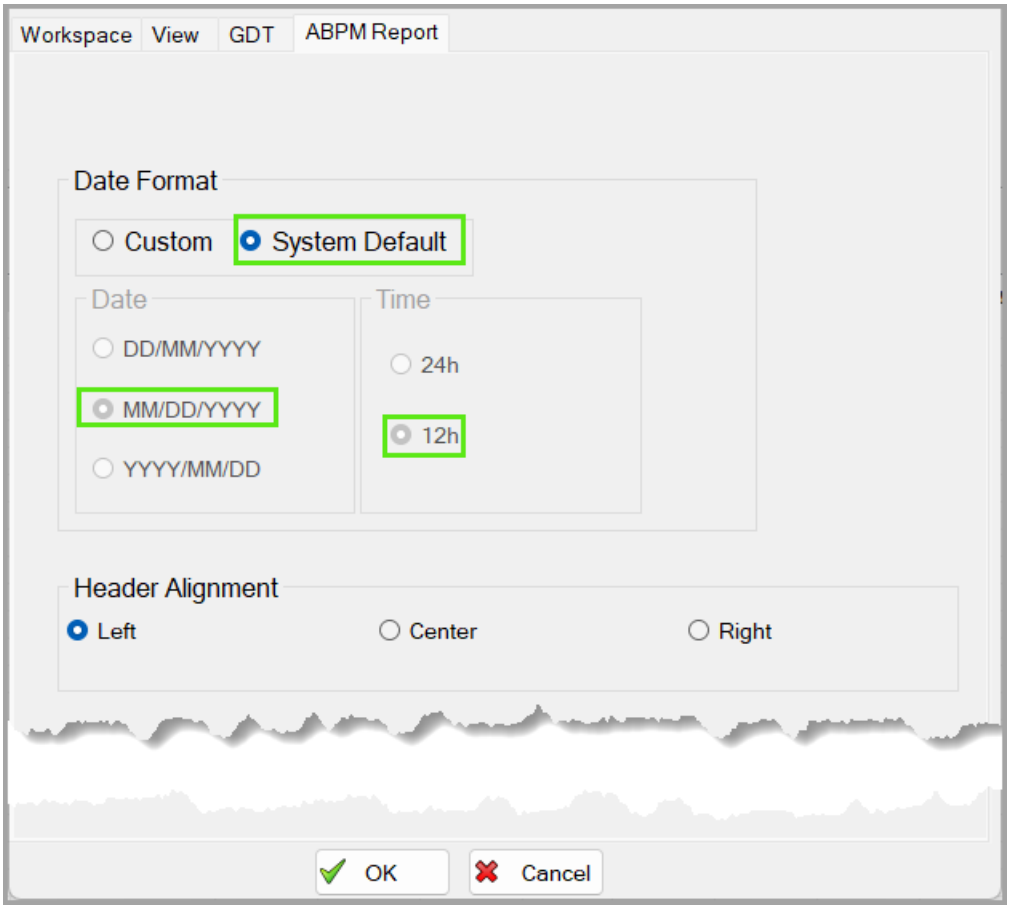


Figure **78**. Setup - ABPM Report Tab - System Default Settings

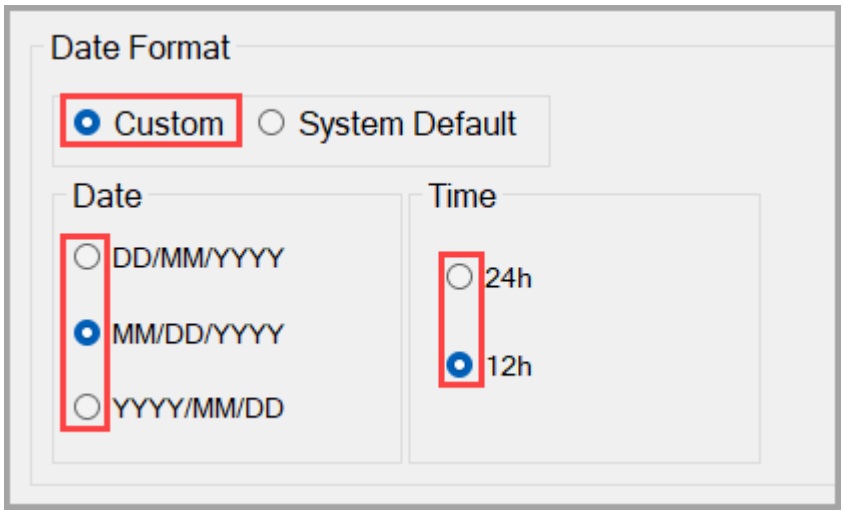
System default date and time formats are:

- **Date:** MM/DD/YYYY
- **Time:** 12h

To adjust the **Date** or **Time** format:

1. Click the **Custom** radio button under the **Date Format** option to unlock the **Date** and **Time** radio buttons.

Figure **79**. Setup - ABPM Report Tab - Custom Date and Time



2. Click on the relevant radio button:
   - **Under the Date option:** To select the desired **Date** format.
   - **Under the Time option:** To select the desired **Time** format.
3. Click **OK** to apply the changes.

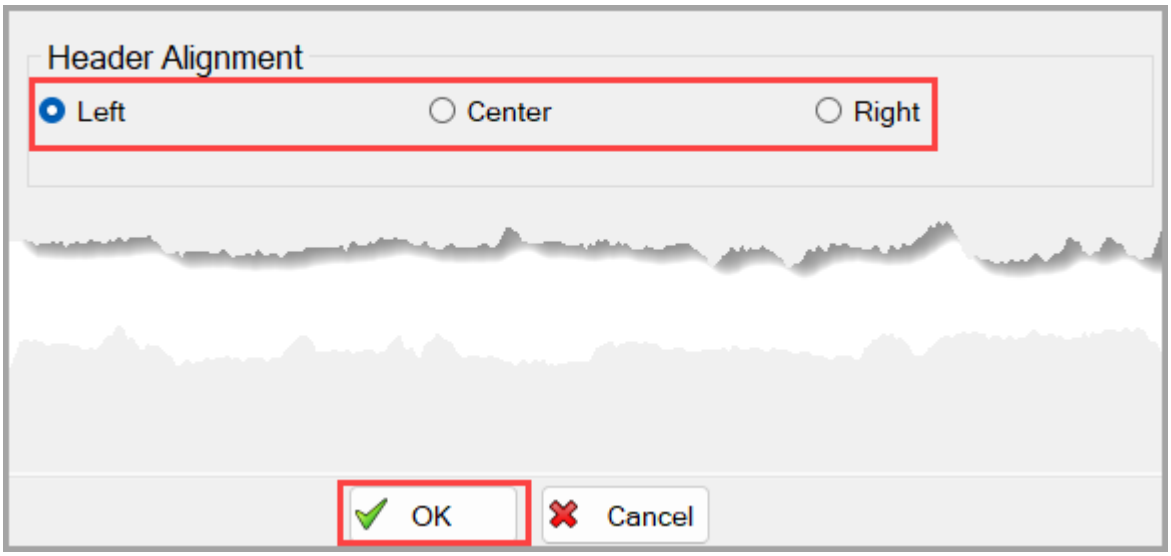
Header Alignment

The **Header Alignment** option determines how the report header will align in the ABPM test record. It provides three standard choices: **Left**, **Center**, and **Right**. By default, **Header Alignment** is set to **Left**.

To adjust the **Header Alignment**:

1. Click on the appropriate radio button within the **Header Alignment** section.

Figure **80**. Setup - ABPM Report Tab - Header Alignment



2. Click on **OK** to apply the changes.

Local Configuration File

Some parameters are adjustable in the local **Settings.xml** configuration file located in C:\ProgramData\NoravMedical\NEMS folder.

Config. Tag Name	Description
<InboxFileDirectory>	Inbound folder for automatic data import
<OutboxFileDirectory>	Outbound folder for automatic PDF reports export
<SQL_ACCESS>	Database mode. The value is always **0** for NEMS-A system
<StressPdfFolder>	PC-ECG software main folder path in Program Files
<NBP_database>	NHMS system database file name (for **H2 Client** database mode only)
<NSpiro_GDT>	GDT exchange folder path for the NSpiro™ spirometry program

App Operation Overview

In this Section, an overview of the main operational functions of the NEMS-A app is provided through detailed description of the application's tabs capabilities. The **Tabs** are functional application screens with a designated **View Area**, enabling users to manage or perform certain actions with test records, patients, patient groups, medical personnel lists, and compatible devices. Each **Tab** focuses on one primary entity, such as test records or patient entries and provides a comprehensive set of tools to process them.

Figure **81**. Tabs - Tabs Panel

The NEMS-A application displays the following tabs in the tabs panel on the left:

- **Records**
- **Patients**
- **Manage**
- **Devices**

Icon	Description
	**Records Tab**: Click to navigate to this tab, enabling test records management, including viewing, reviewing, exporting, searching, sorting, etc.
	**Patients Tab**: Click to navigate to this tab, enabling patient management, including adding new patients, editing, and deleting existing ones, preparing various devices to perform tests, etc.
	**Manage Tab**: Click to navigate to this tab, enabling the creation of user groups, as well as referring physicians, technicians, and reporting MDs lists.
	**Devices Tab**: Click to navigate to this tab, enabling the downloading of test records from Holter and ABPM devices (ECG and Blood Pressure recordings respectively). **Note:** You can connect only one device at a time to download a record. To prevent potential downloading errors, avoid connecting multiple de- vices during the records downloading step.

Note: When you navigate to the **Records** or **Patients** tab just after launching the application, you will notice that the View Area of those tabs lacks records or patient data, respectively. To populate it with records/patient data, choose any search criteria and click **Search**. It is recommended to check all three checkboxes for the **Gender** option (applicable to both the **Records** and the **Patients** tabs) and the **All** option under the **Test Date** (applicable to the **Records** tab only) to display all available data.

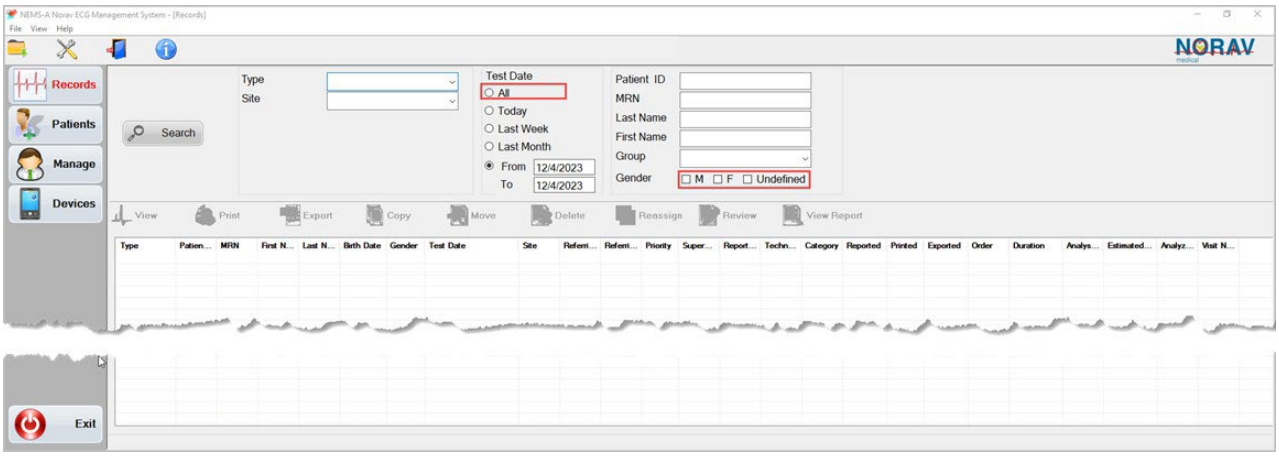


Figure **82**. Tabs - Records Tab Empty

Records Tab

The **Records** tab facilitates the following capabilities:

- Searching records by applying different types of search filters.
- Searching records by scanning a barcode.
- Operations on records – including viewing, exporting, reviewing, deleting, and more.

The **Records** tab includes the following sections:

1. **Filters Pane**
2. **Actions Bar**
3. **Records List**
4. **Preview Panel**

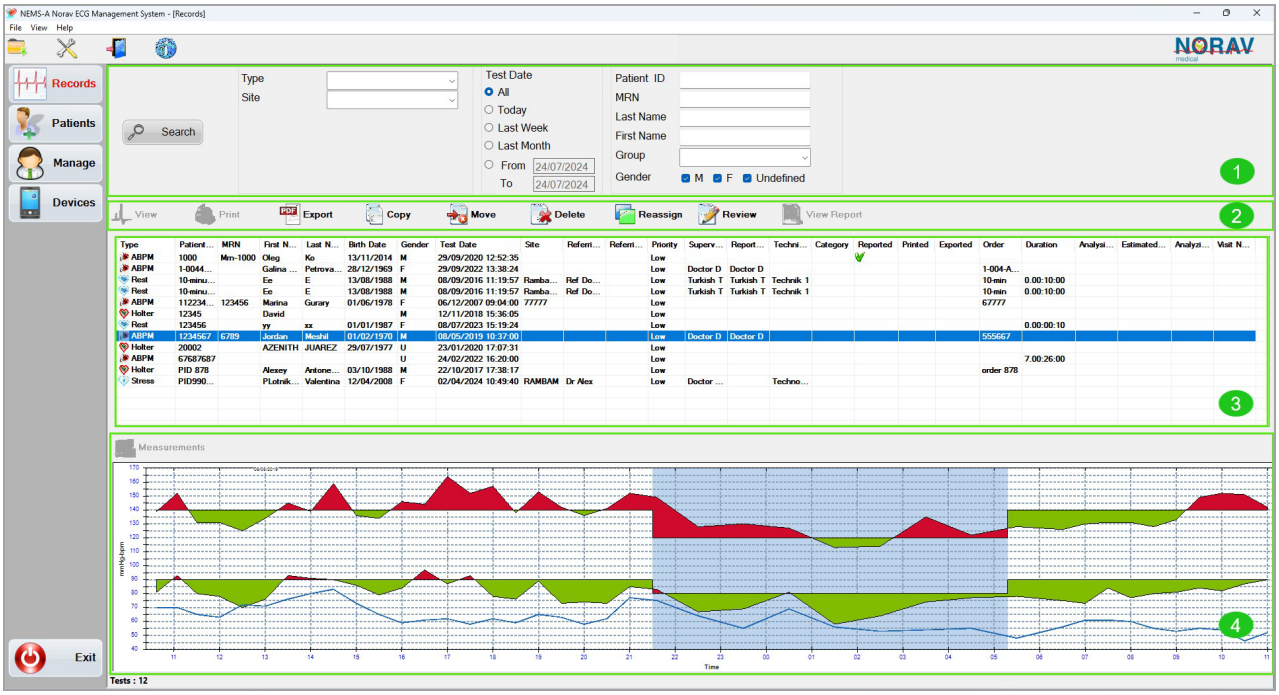


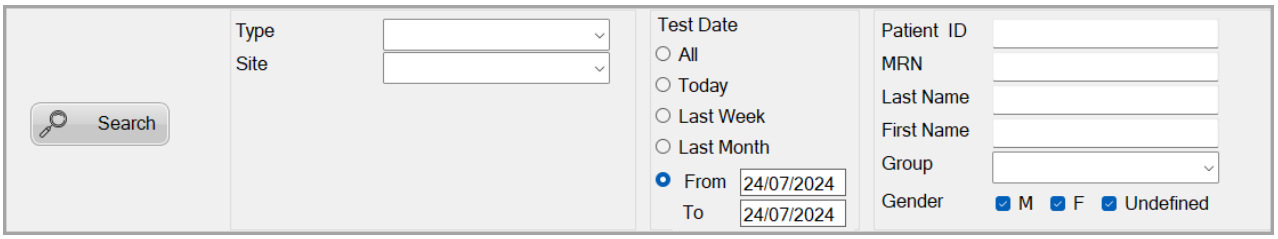
Figure **83**. Records Tab - Tab Sections

It allows users to display records using various filters in the **Filters Pane** and perform operations on patients' records in the **Records List**.

Filters Pane

The **Filters Pane** offers various filters to help users efficiently search for records based on key parameters such as test type, test date, patient ID, and more. Refer to the table below for a detailed description.

Figure **84**. Records Tab - Filters Pane



To filter the records:

1. Select available options and/or enter relevant values in the appropriate text fields.
2. Click the **Search** button to apply filters.

Note: You need to select or enter at least one search parameter (excluding the default value "All" under **Test Date**) to display records in the **Records List**. Until you choose a search parameter, a warning sign appears beneath the Search button (as shown below).

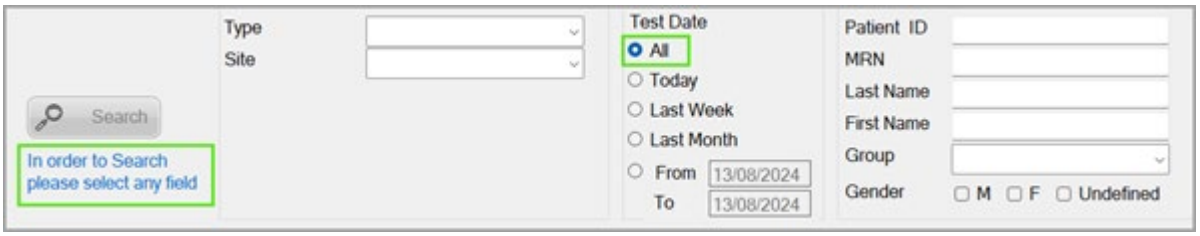


Figure **85**. Records Tab - Filters Pane - Warning Sign

Filter Types

Filter	Description
Type	**Filter by Test Type:** Click on the **Type** drop-down menu and select (check) checkboxes next to relevant test types (you can use multiple selection): **Rest**, **Stress**, **Holter**, **ABPM**, or **SPIRO**.
Site	**Filter by Test Site:** Click on the **Site** drop-down menu and select the checkboxes next to the relevant test sites. A site can be a clinic or a specific location, e.g., Delray Clinic, RAMBAM Hospital, etc. The specific sites are derived from the **"Site"** parameter of the records populating the **Records List**.
Test Date	**Filter by Test Date:** Click the relevant radio button to choose an appropriate test date range: **All**, **Today**, **Last Week**, **Last Month**, or **From/To**. When selecting the **From/To** option, enter the relevant dates in the text fields next to this option.
Patient ID	**Filter by Patient ID:** Enter the patient's ID in the text field next to this option.
MRN	**Filter by Medical Record Number:** Enter the MRN in the text field next to this option.
Last Name	**Filter by Last Name:** Enter the patient's last name in the text field next to this option.
First Name	**Filter by First Name:** Enter the patient's first name in the text field next to this option.
Group	**Filter by Group:** Click on the **Group** drop-down menu and select a patient group to filter the records. Patient groups can be created in the **Manage** tab. After creating a **Group**, you can add patients to it and search for them in the **Records** tab using this filter. You need to create relevant groups first to use them for filtering records. There is only one predefined default patient group named **All**, which includes all patients within the system. For more detailed information about groups, refer to the **Manage** section.
Gender	**Filter by Gender:** To filter the records, select the checkboxes next to the gender markers: **M** (Male), **F** (Fe- male), **Undefined**. You can make multiple selections.

Actions Bar

The **Actions Bar** embeds a list of actions a user can perform on records within the **Records** tab, including viewing, exporting, reviewing, and more. Refer to the table below for a detailed description.

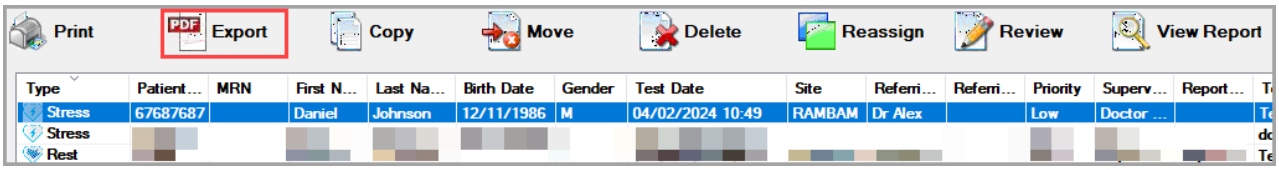
Figure **86**. Records Tab - Actions Bar

Button	Description
Print	Click this button to print the report associated with the selected record. You need a PDF viewer installed on your PC to print the report.
Export	Click this button to export the report associated with the selected ABPM, Rest, or Stress record (not available for Holter records). If the report does not exist, it will be created and exported to the [YOUR_DRIVE]:\Program-Data\NoravMedical\NEMS\ECGDBase\Reports folder. Once exported, the record will be marked with a green check- mark in the **Exported** and **Reported** columns of the **Records List**.
Copy	Click this button to copy the selected record to a backup. This operation allows you to duplicate a record for backup purposes, review by another physician without access to the NEMS-A system, or transfer to another location.
Move	Click this button to move the selected record. The **Move** operation is intended to transfer an existing record to an external location and remove it from the NEMS-A system. This operation can be used for moving an incorrect test or migrating a record from one system to another. Once moved, the record can no longer be viewed within NEMS-A. Only an indication of the record remains within the system, if needed.
Delete	Click this button to delete the selected record.
Reassign	Click this button to reassign the selected record to another patient. Reassigning a record is necessary if it was mistakenly assigned to the wrong patient.
Review	Click this button or double-click a record in the **Records List** to review the selected record within the rel- evant application. For example, Rest and Stress records are reviewed in **PC-ECG 1200**, Holter records in **NH-301**, and ABPM records directly within the **NEMS-A** app. This action facilitates test review and report generation. Once reviewed, the record will be marked with a green checkmark in the **Reported** and **Export- ed** columns of the **Records List**.
View Report	Click this button to view the report associated with the selected record. If the report does not exist, it will be generated, and the PDF containing the report will open in the available PDF viewer.

Exporting Reports

To export a report:

Figure **87**. Records Tab - Actions Bar - Export



1. Select a record in the **Records List**.
2. Click the **Export** button in the **Actions Bar**.
3. A progress indicator pop-up will be displayed:

Figure **88**. Records Tab - Export - Progress Indicator

- If a report is associated with the selected record, the progress indicator pop-up will disappear after a short period, and the report will be exported to the following location:
  [YOUR_DRIVE]:\ProgramData\NoravMedical\NEMS\ECGDBase\Reports
- If no report is associated with the selected record, a report will be generated and exported to the same location:
  [YOUR_DRIVE]:\ProgramData\NoravMedical\NEMS\ECGDBase\Reports

4. After the export is completed, the record will be marked with a green checkmark in the **Exported** and **Reported** columns of the **Records List**.

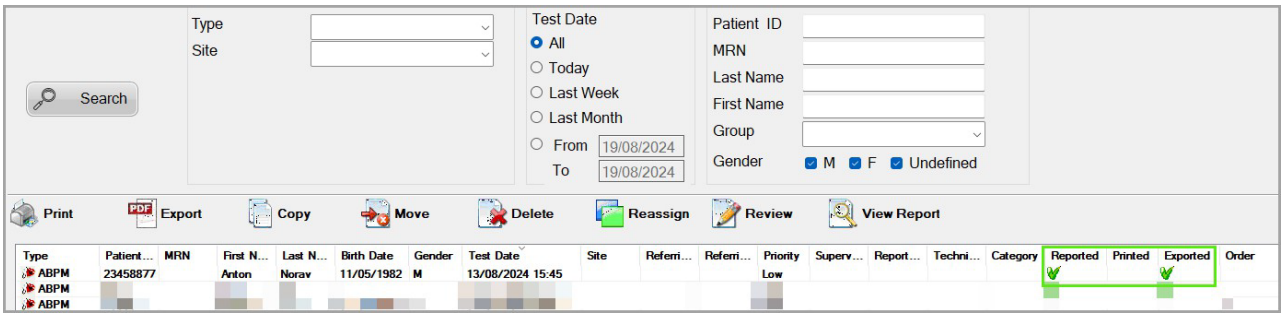


Figure **89**. Records Tab - Reported and Exported Marks

Note: Users will be able to access this report within the application using the **View Report** button. Alternatively, users can access a PDF containing the report in the following location, if needed:

`[YOUR_DRIVE]:\ProgramData\NoravMedical\NEMS\ECGDBase\Reports\[TEST_DATE_YEAR]\[TEST_DATE_MONTH]`

`[TEST_DATE_YEAR]` and `[TEST_DATE_MONTH]` correspond to the year and month from the **Test Date** column of the specific record.

For example, if the **Test Date** of the record is 13/08/2024 (MM/DD/YYYY), the path to the record may look like this:

`C:\ProgramData\NoravMedical\NEMS\ECGDBase\Reports\2024\8`

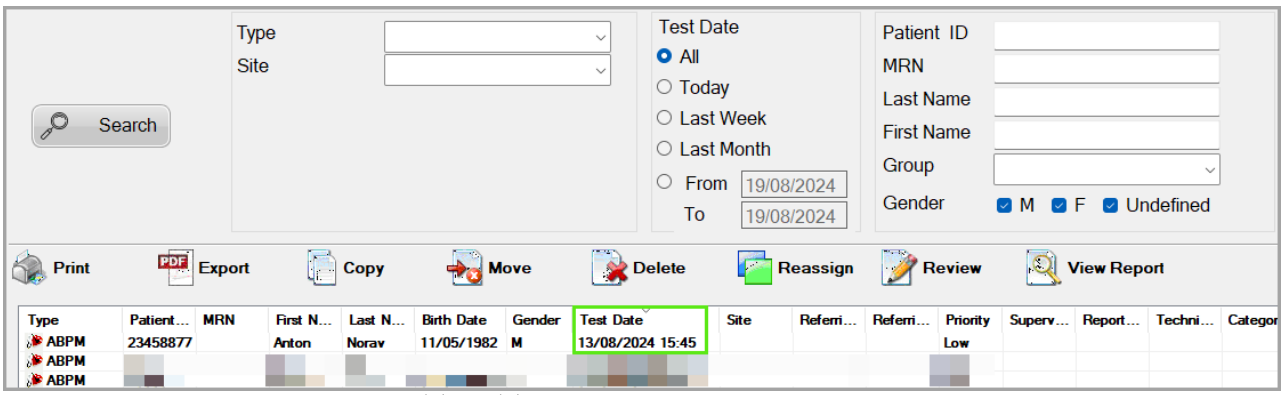


Figure **90**. Records Tab - Test Date Column

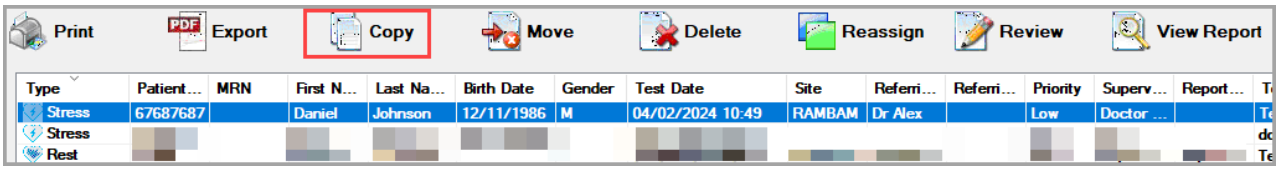
Copying Records

When a user copies a record, a corresponding log entry is created in the application's

database along with the record's copy. This entry contains the name of the copy, the timestamp, the full path to the folder containing the copy, and any remarks. The **Copy** button provides access not only to copying patient records but also to managing the log of the created copies.

To copy a patient's record:

Figure **91**. Records Tab - Actions Bar - Copy



1. Select a record in the **Records List**.
2. Click the **Copy** button in the **Actions Bar**. The **Copy** dialog box will be displayed.

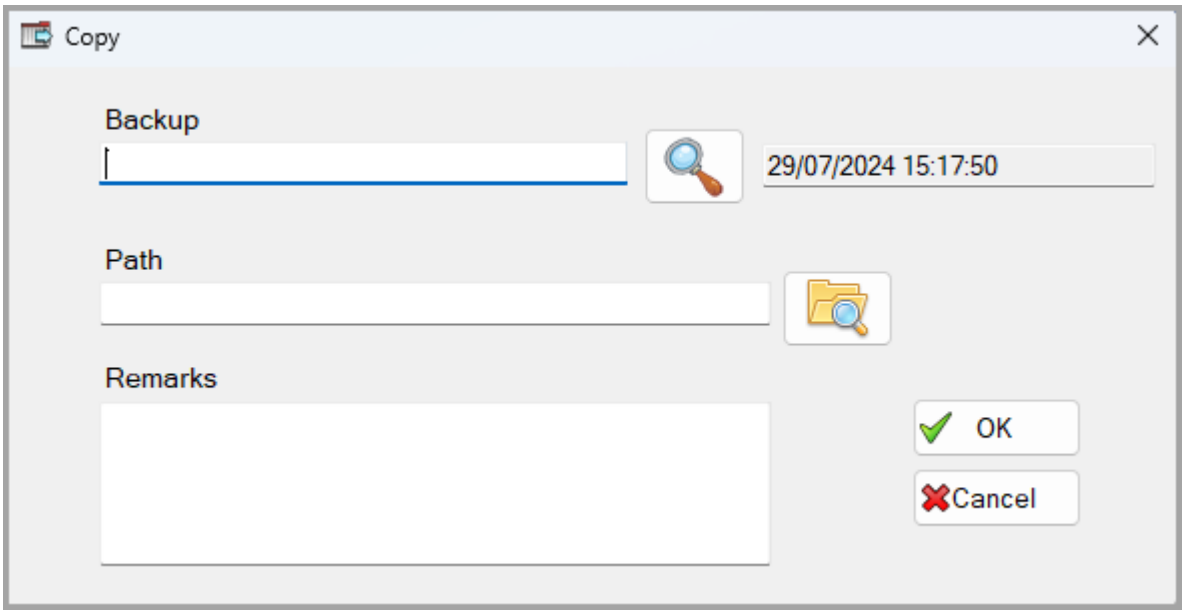
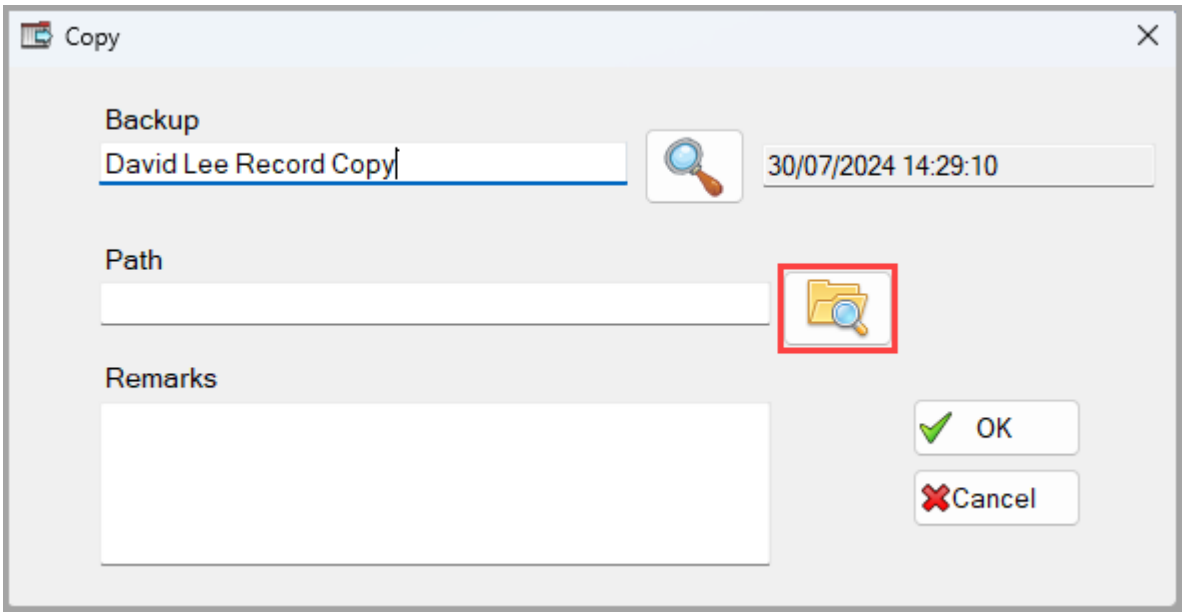


Figure **92**. Records Tab - Copy - Copy Dialog Box

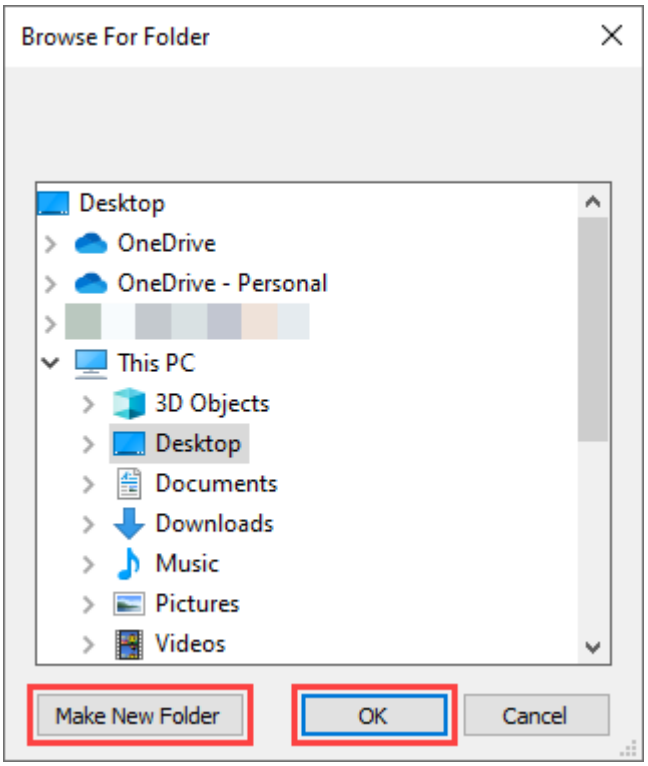
3. Click the Explore icon to open the **Browse For Folder** dialog box:

Figure **93**. Records Tab - Copy - Setting Path



3.1. Navigate to the location you need and choose a relevant folder.

Figure **94**. First Launch Set Up - Browse For Folder

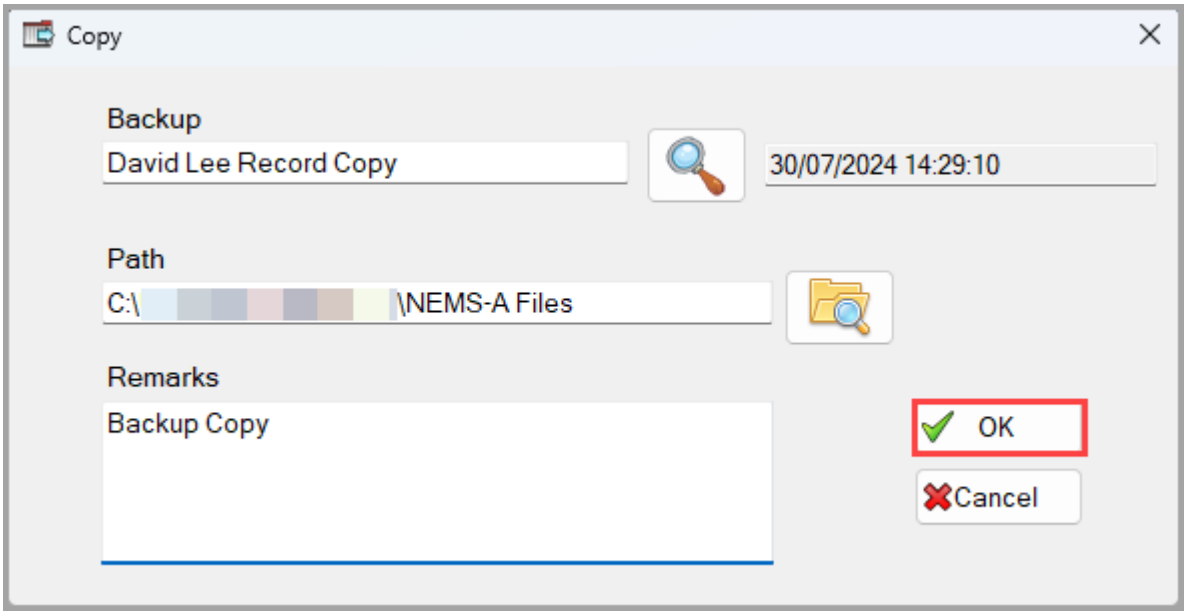


3.2. **(Optional)** To create a new folder, click **Make New Folder** in the bottom-left corner of the dialog box and type in the folder name manually.

3.3. After you have selected the folder, click **OK** to confirm the path.

4. **(Optional)** Enter remarks in the **Remarks** text field, if needed. Remarks serve as notes where you can include any relevant information about the backup you create.
5. Click **OK** to create a copy of the selected record and save it in the folder you have selected.

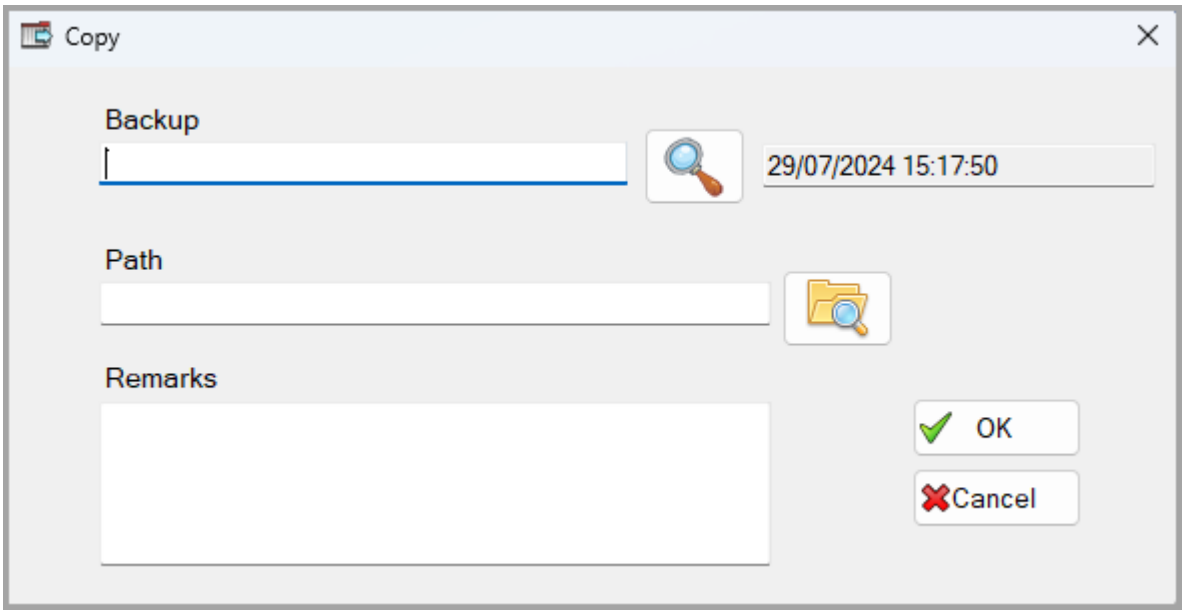
Figure **95**. Records Tab - Copy - Creating Copy



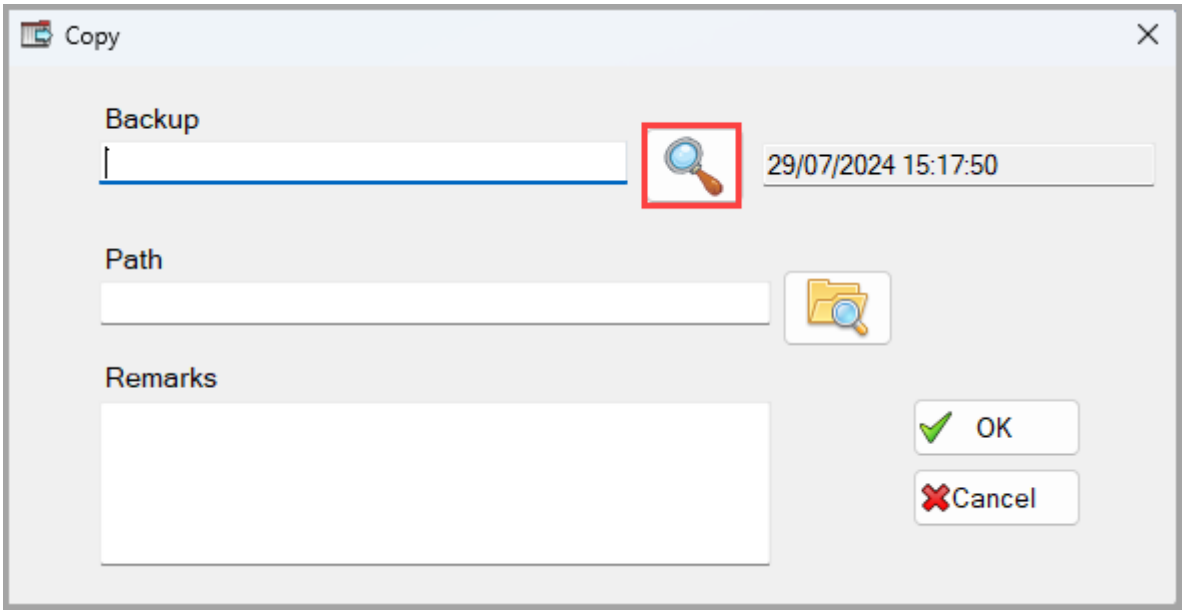
To access log entries:

1. Select a record in the **Records List**.

2. Click the **Copy** button in the **Actions Bar**. The **Copy** dialog box will be displayed.
   Figure **96**. Records Tab - Copy - Copy Dialog Box



3. Click the Search icon next to the **Backup** text field. The **Backup** dialog box will be displayed.
   Figure **97**. Records Tab - Copy - Search



4. Click the **Name** drop-down menu to expand it.

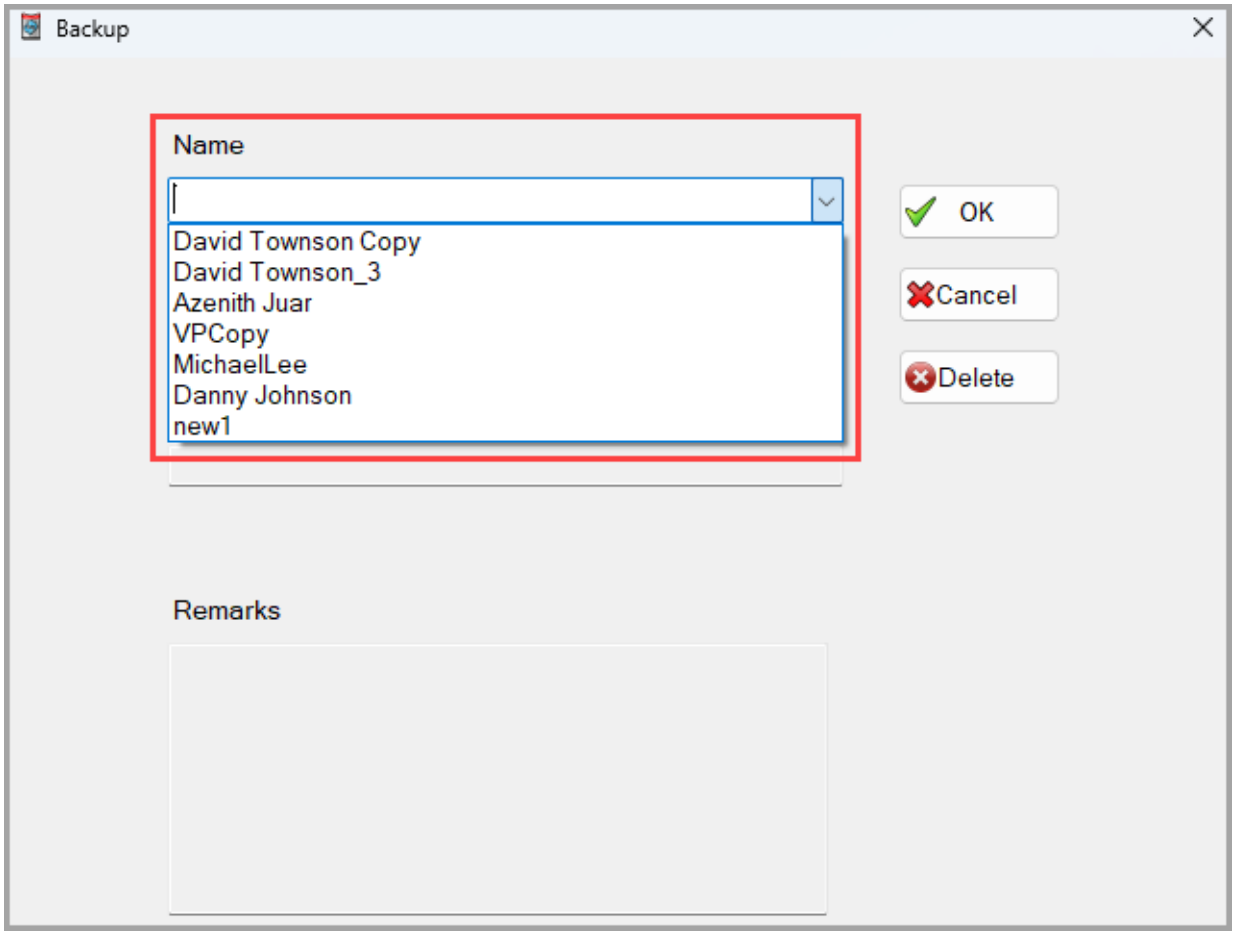
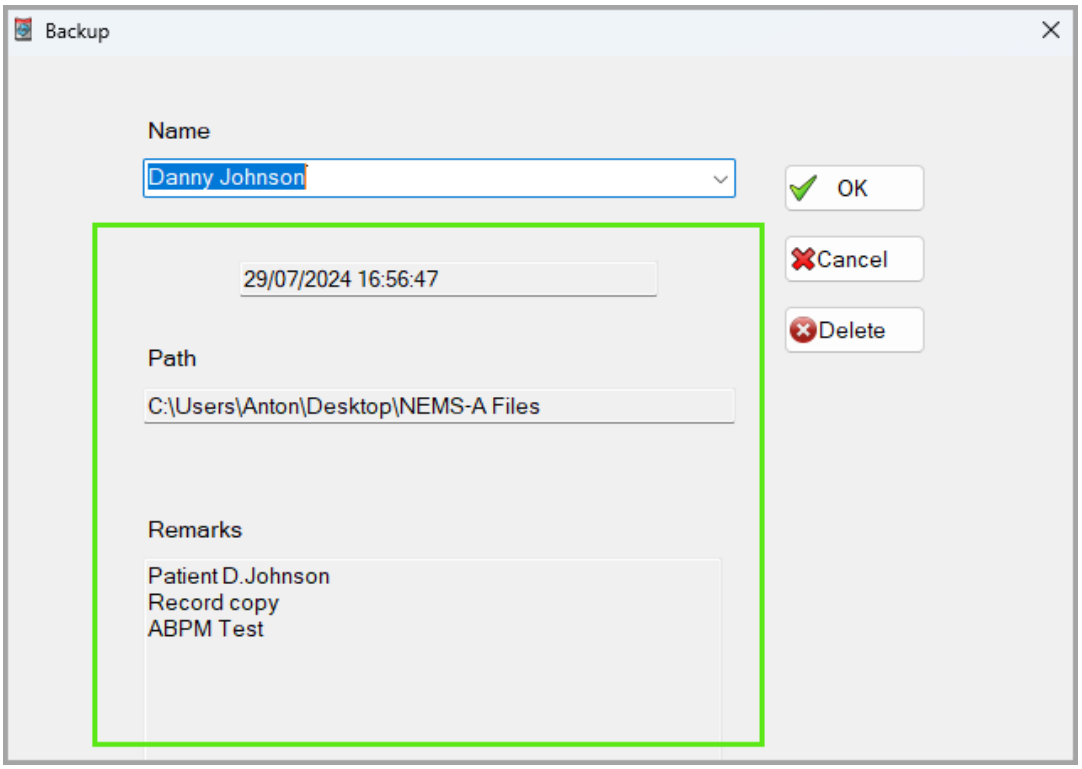


Figure **98**. Records Tab - Copy - Name Drop-Down Menu

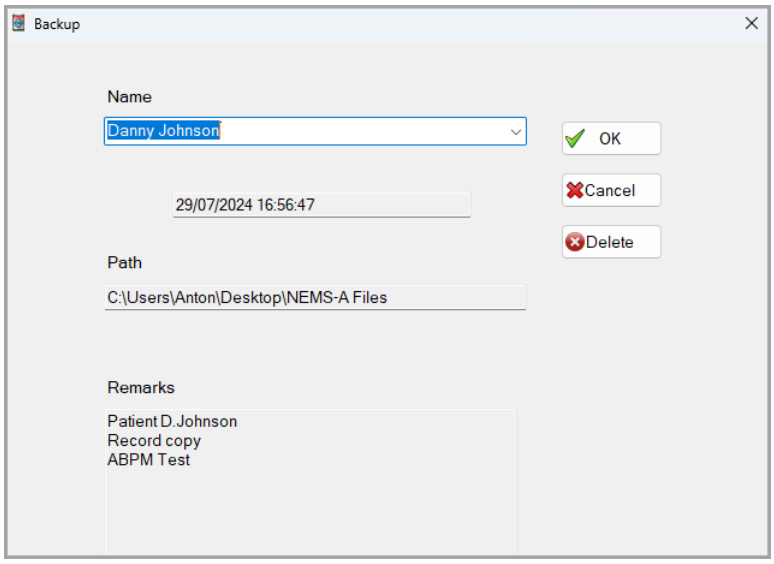
5. Select the relevant name of the copy you made earlier to access the log entry. The copy creation timestamp, the path to the copy, and the remarks will be displayed within the **Backup** dialog box. You cannot edit any of the entry's data within this dialog box.

Figure **99**. Records Tab - Copy - Accessing Log Entry



After you have selected a log entry and the entry information is displayed, you can do the following:

Figure **100**. Records Tab - Copy - Log Entry Data

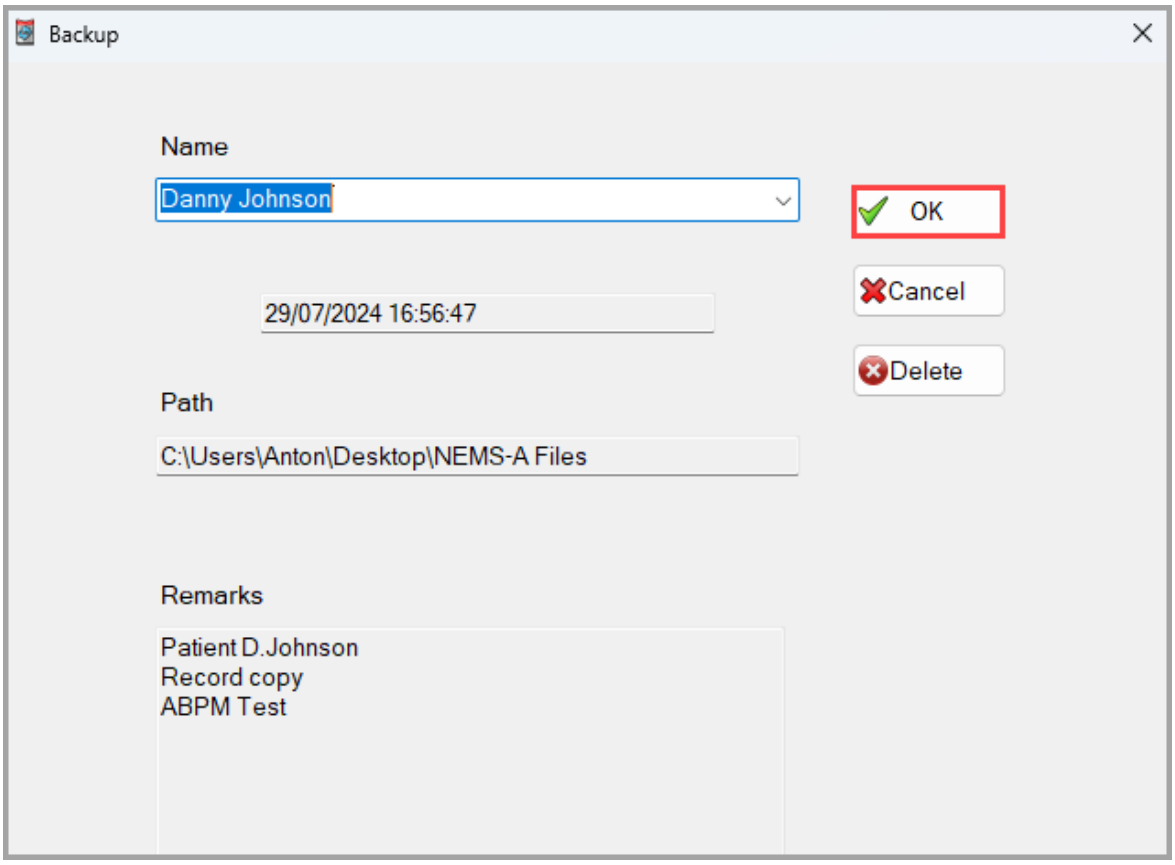


- Update the remarks.
- Return to the **Copy** dialog box.
- Delete the entry.

To update the remarks:

1. Access the log entry you need by following the instructions above.
2. Click **OK** when the requested log entry data is displayed.

Figure **101**. Records Tab - Copy - Editing Log Entry



3. You will be redirected to the **Copy** dialog box. The same copy creation timestamp, the path to the copy and the remarks as in the **Backup** dialog box will be displayed in the **Copy** dialog box.
4. Edit the content within the **Remarks** text field as needed. This text field is editable within the **Copy** dialog box, unlike in the **Backup** dialog box.

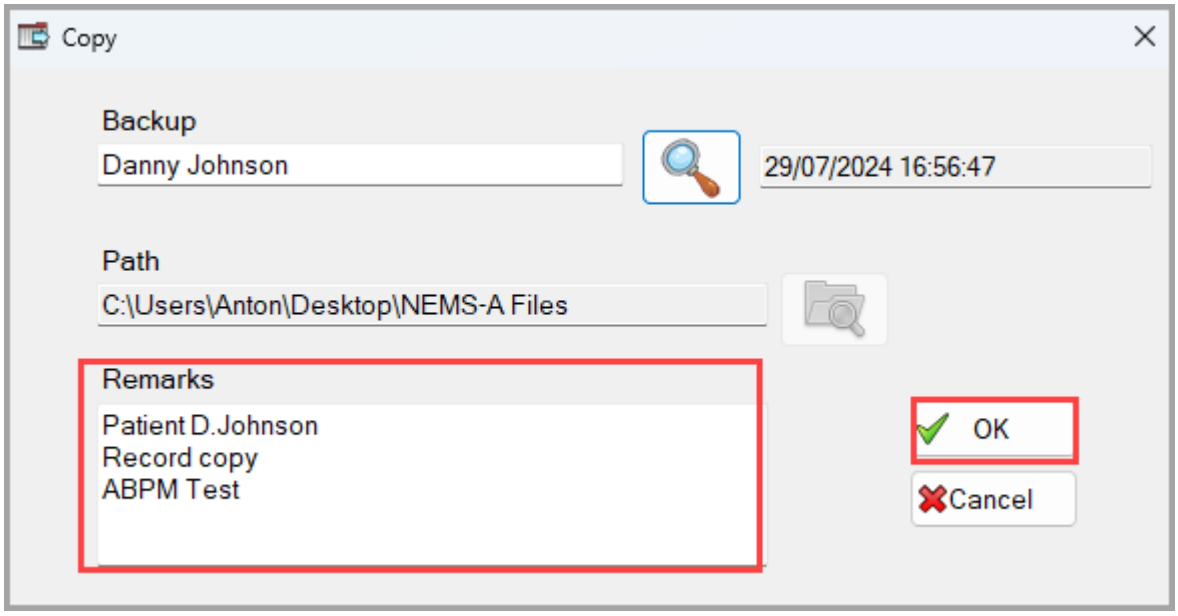
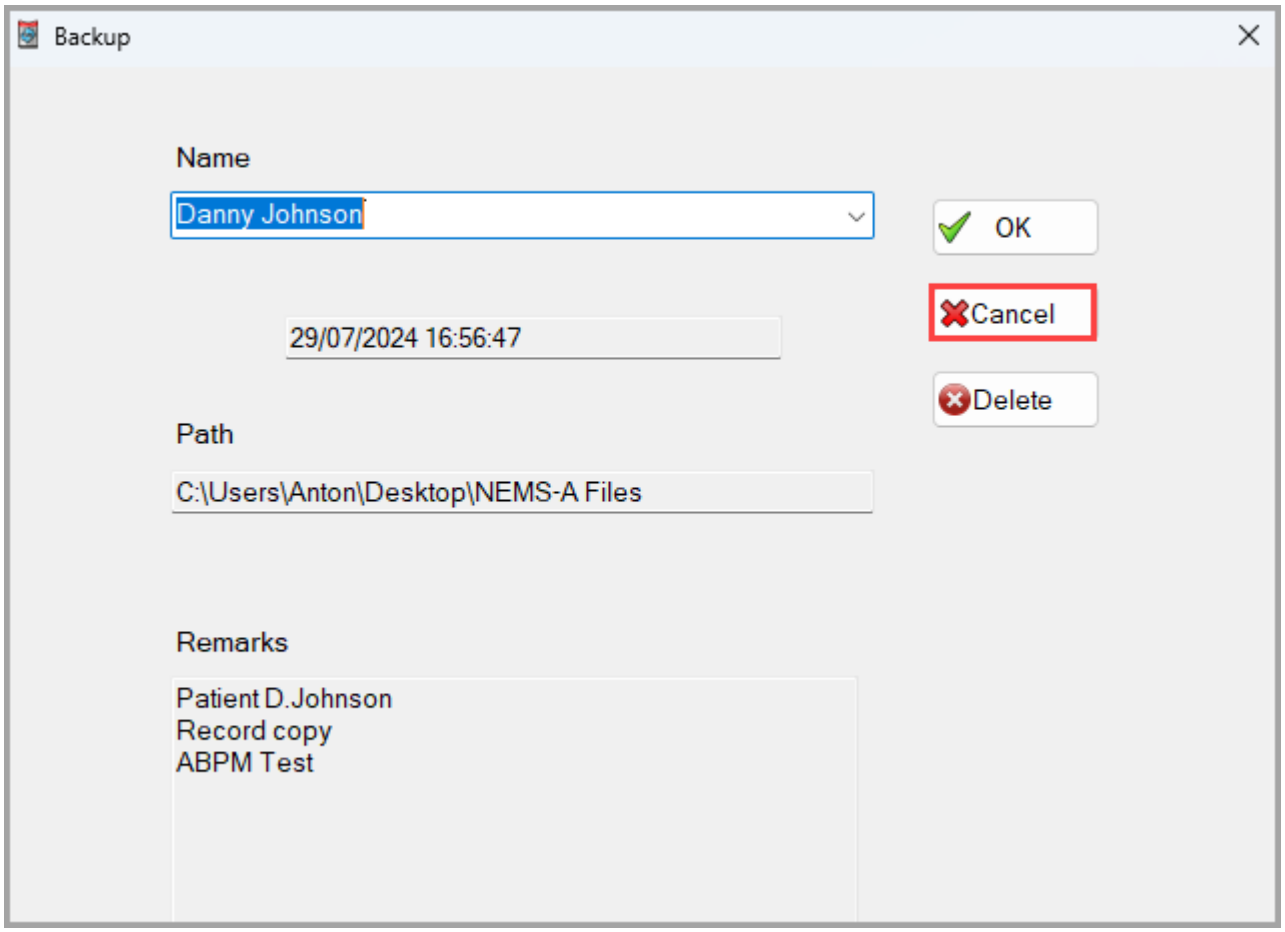


Figure **102**. Records Tab - Copy - Editing Remarks

5. Click **OK** to save the changes in the **Remarks** of the log entry.

To return to the Copy dialog box:

Figure **103**. Records Tab - Copy - Return to Copy Dialog Box

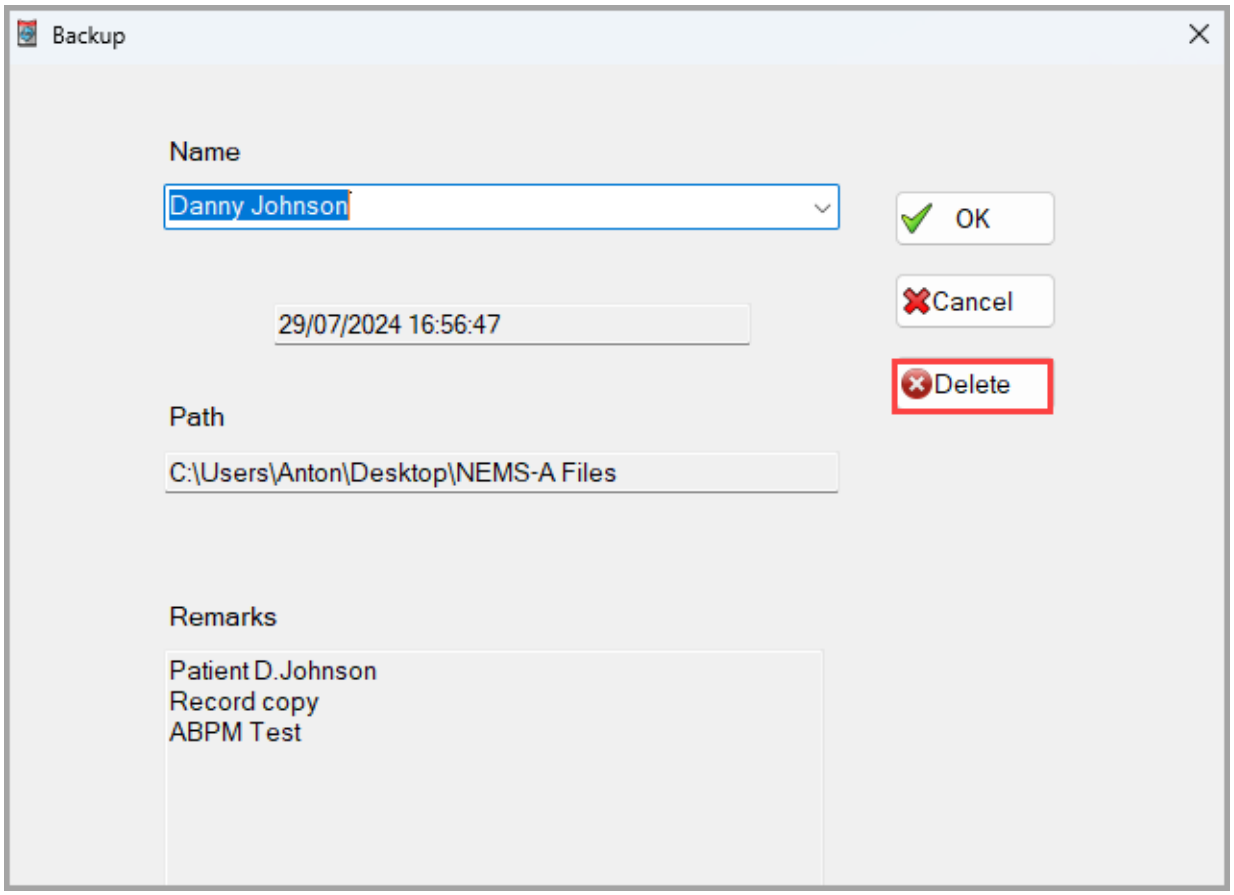


1. Click **Cancel**.

To delete the selected log entry:

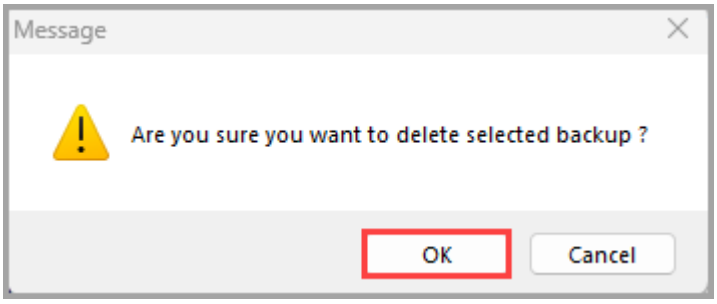
1. Access the log entry you need, following the instructions above.
2. Click **Delete**.

Figure **104**. Records Tab - Copy - Delete Log Entry



3. A pop-up warning window will be displayed (see below).

Figure **105**. Records Tab - Copy - Delete Warning



4. Click **OK** to delete the selected log entry.

Moving Records

The **Move** function's user interface closely resembles that of the **Copy** function, sharing many key features. Like the **Copy** function, the **Move** action allows you to transfer existing records to an external location and remove them from the NEMS- A system. It also provides similar log management functions as the **Copy** function. For further details, refer to the Copying Records section.

To move a patient's record:

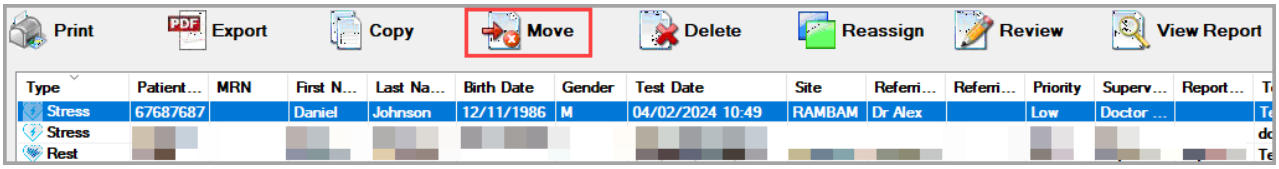
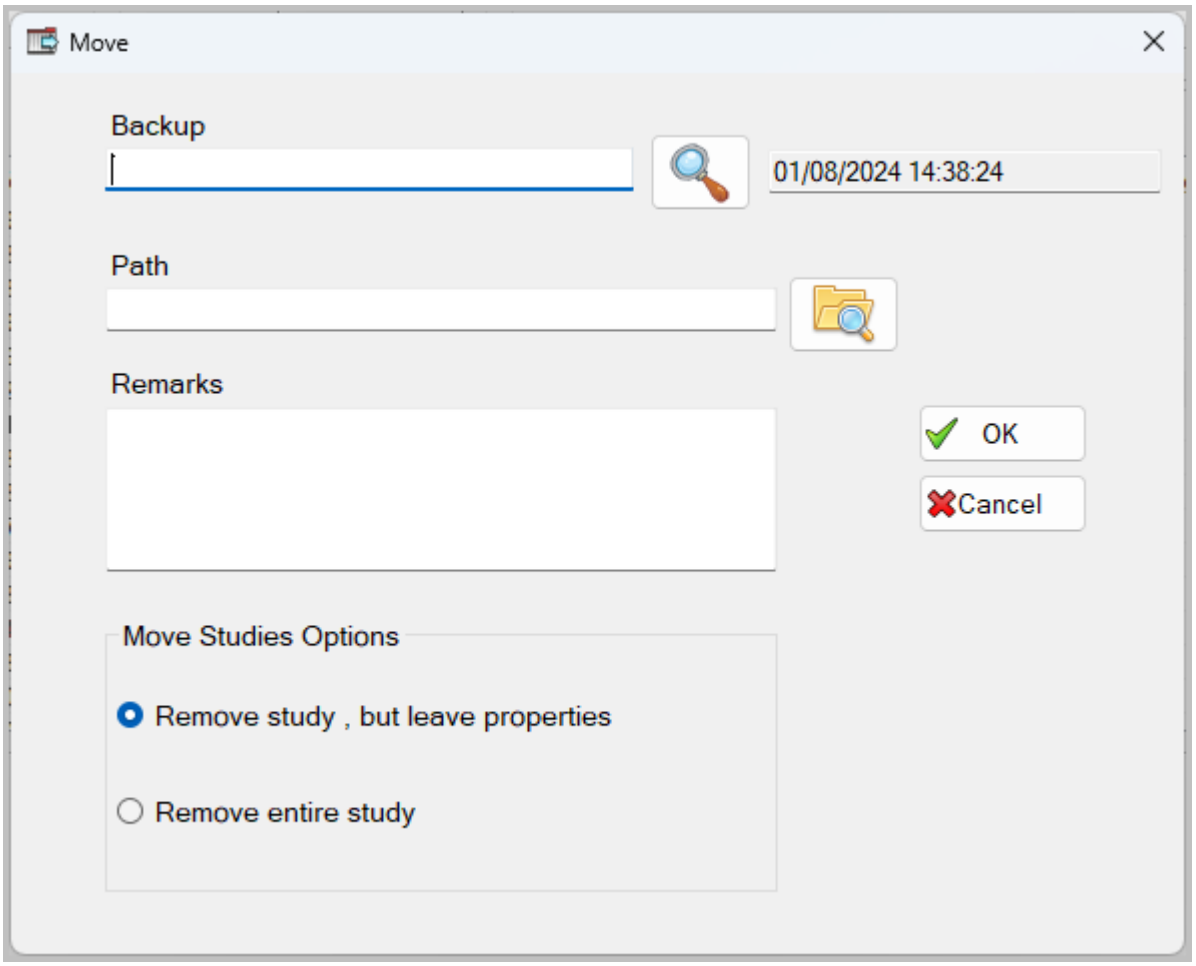


Figure **106**. Records Tab - Actions Bar - Move

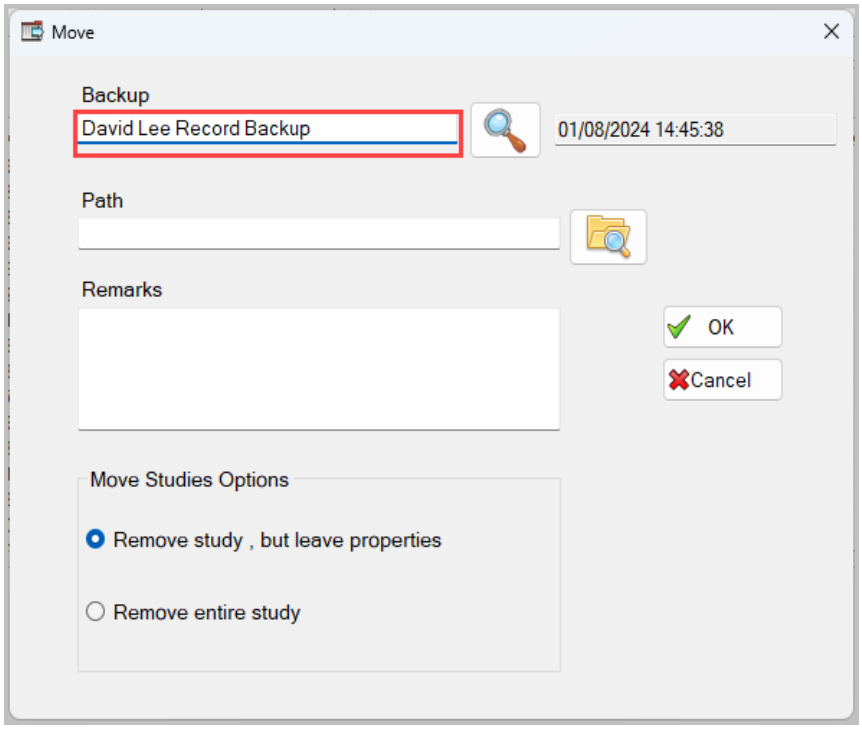
1. Select a record in the **Records List**.
2. Click the **Move** button in the **Actions Bar**. The **Move** dialog box will be displayed.

Figure **107**. Records Tab - Move - Move Dialog Box



3. Enter the copy name in the **Backup** text field.

Figure **108**. Records Tab - Move - Backup Name



4. Click the Explore icon to open the **Browse For Folder** dialog box:

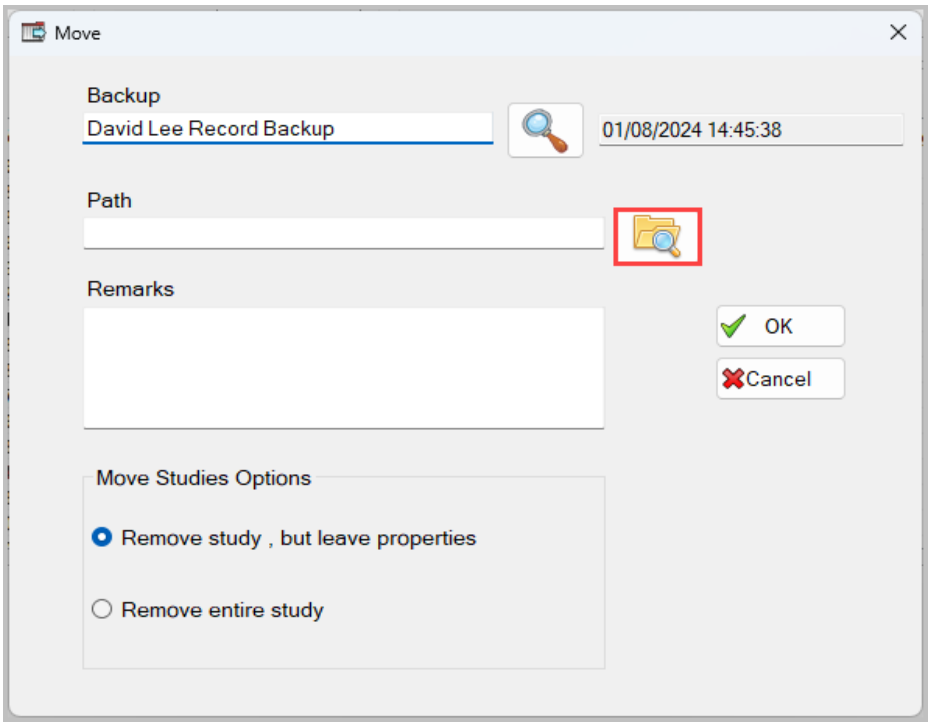
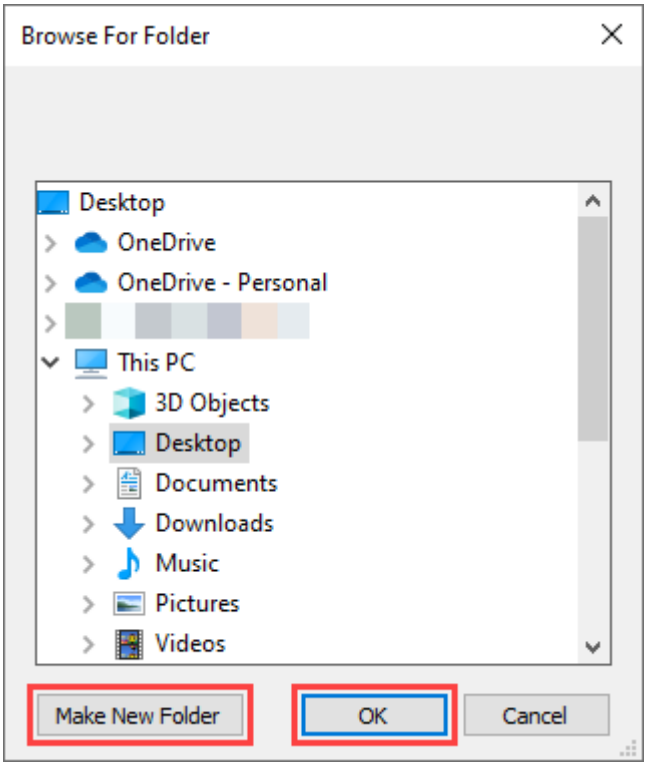


Figure **109**. Records Tab - Move - Setting Path

4.1. Navigate to the location you need and choose a relevant folder.

Figure **110**. First Launch Set Up - Browse For Folder



4.2. **(Optional)** To create a new folder, click **Make New Folder** in the bottom-left corner of the dialog box and type in the folder name manually.

4.3. After you have selected the folder, click **OK** to confirm the path.

5. **(Optional)** Enter remarks in the **Remarks** text field, if needed.

6. Select one of the available options under **Move Studies Options**:

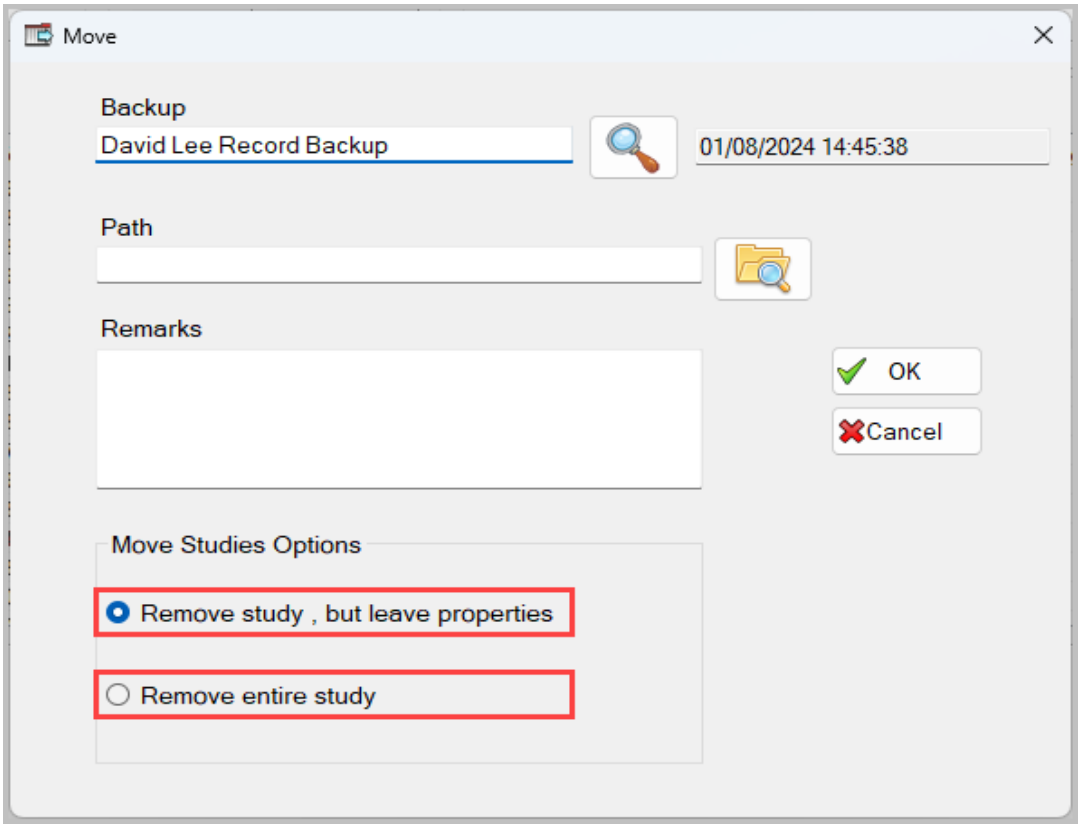
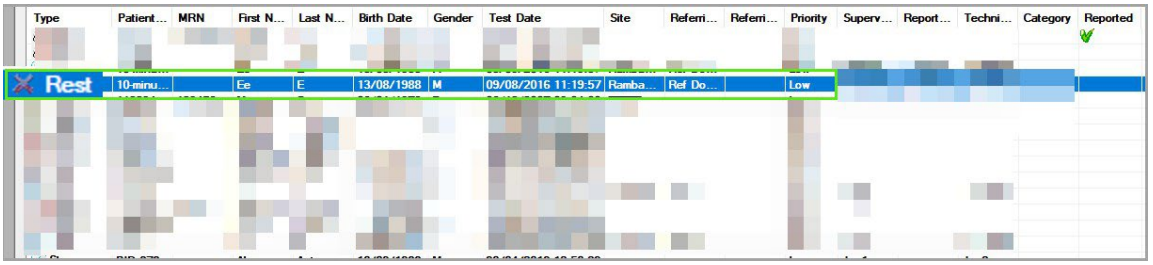


Figure **111**. Records Tab - Move - Move Options

◦ Click "**Remove study, but leave properties**" to move the record but keep the record information in the **Records List**. In this case, all the record's data in the **Records List** remains intact, but the record itself and related report are no longer accessible within the system.

Figure **112**. Records Tab - Move - Record Moved, Data Kept

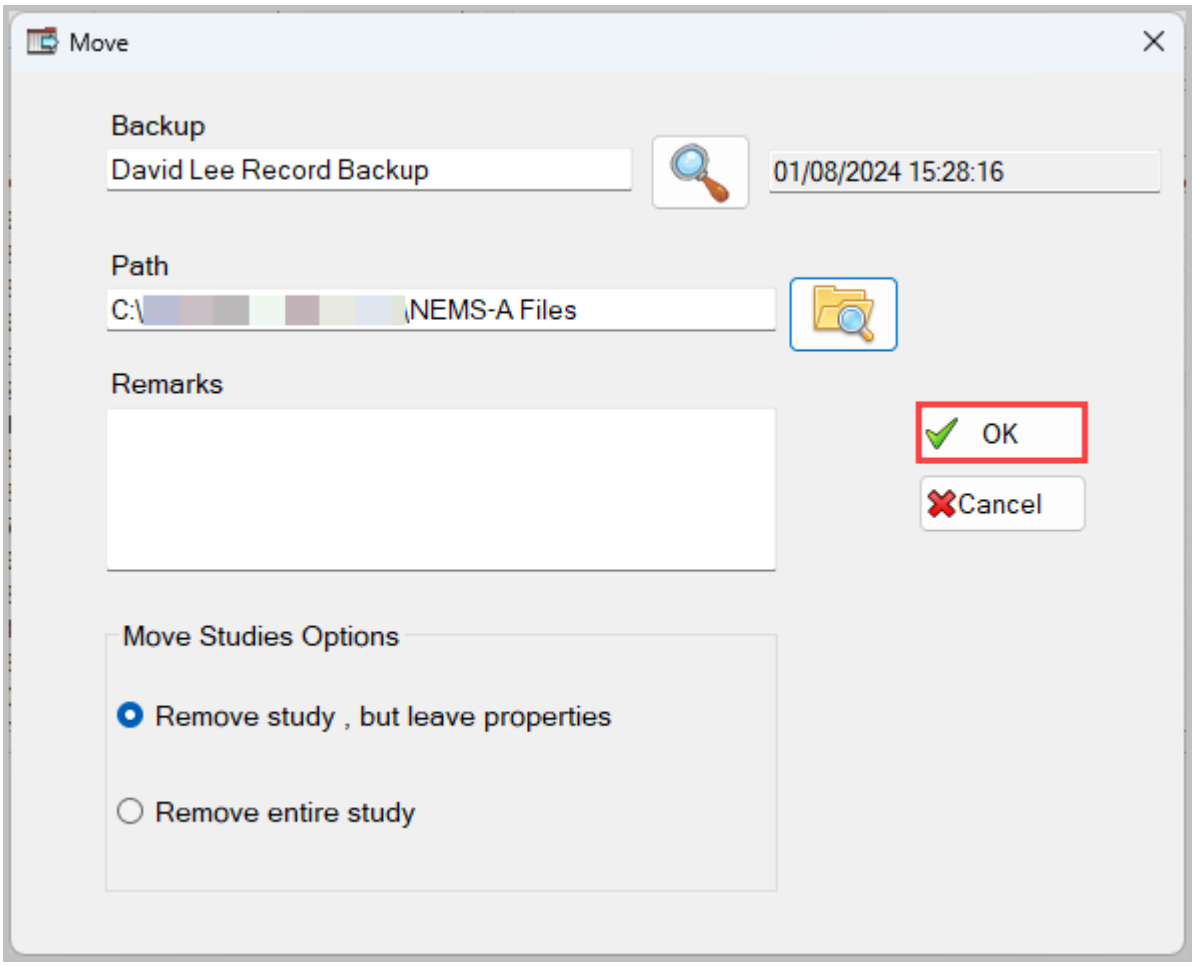


Note: You will be able to remove the record's data from the **Records List** anytime using the **Delete** button in the **Actions Bar**. For more details, refer to the subsection about deleting the records.

◦ Click "**Remove entire study**" to move the record and remove all the record information from the **Records List**. Both the record and its data are removed from the system.

7. Click **OK** to confirm your choice and move the selected record to the selected folder.

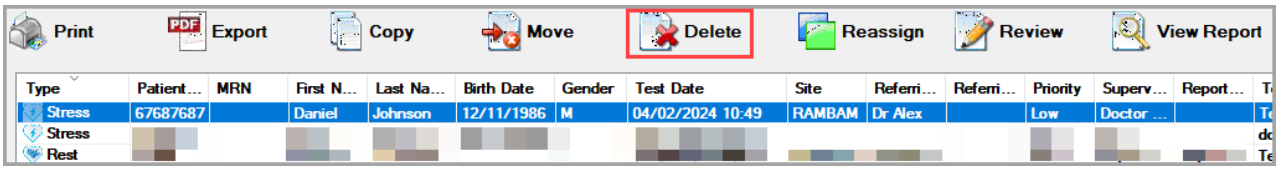
Figure **113**. Records Tab - Move - Moving Copy



Deleting Records

To delete a patient's record:

Figure **114**. Records Tab - Actions Bar - Delete



1. Select a record in the **Records List**.
2. Click the **Delete** button in the **Actions Bar**. The **Delete** dialog box will be displayed.

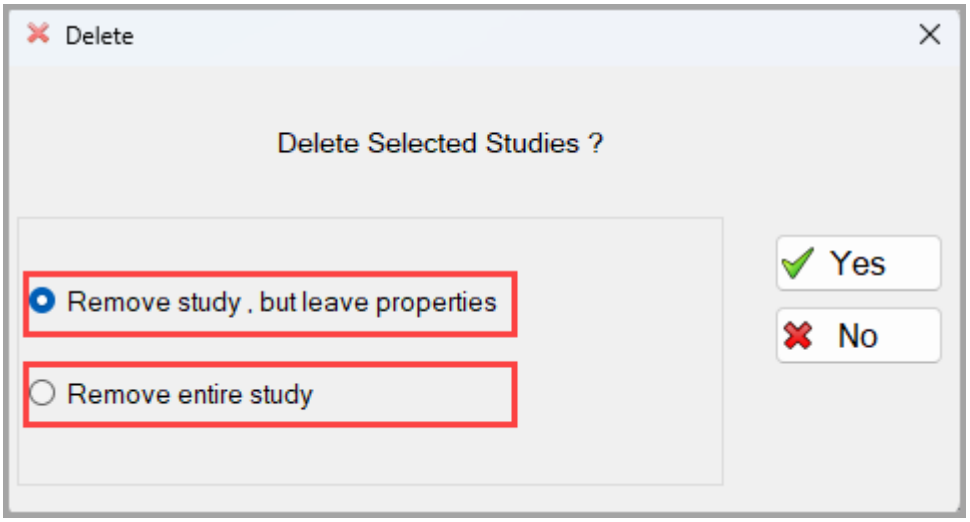
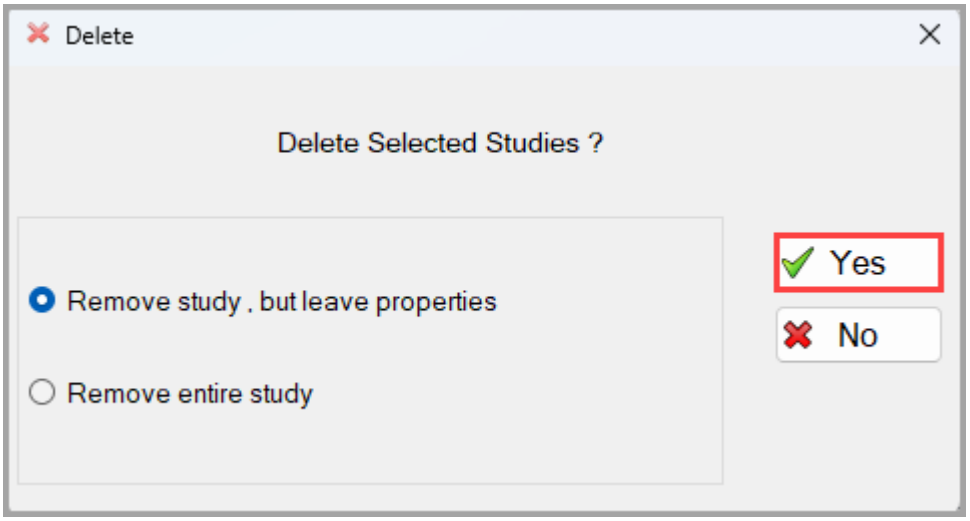


Figure **115**. Records Tab - Delete - Delete Dialog Box

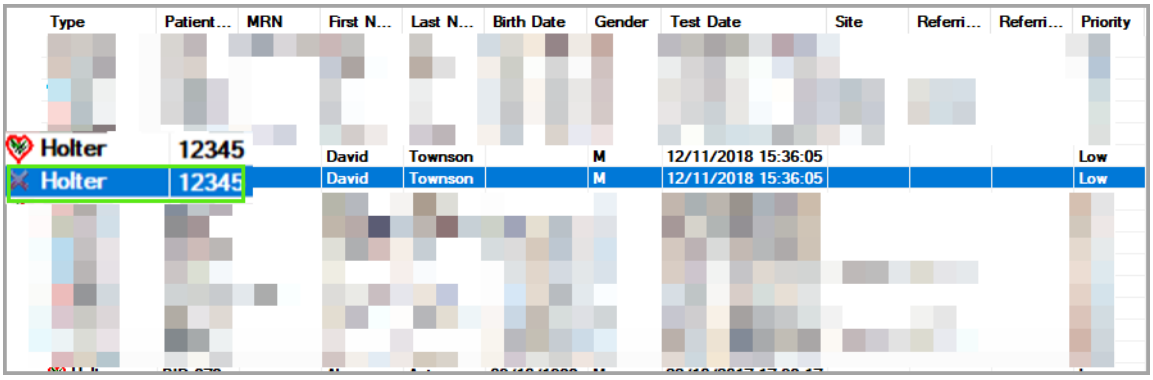
3. Select one of the available options:

Figure **116**. Records Tab - Delete - Delete Options



- Click "**Remove study, but leave properties**" to remove the record from the system but keep the record information in the **Records List**. In this case, all the record's data in the **Records List** remains intact, but the record itself and related report are no longer accessible within the system.

Figure **117**. Records Tab - Delete - Record Removed, Data Kept



◦ Click "**Remove entire study**" to remove the record and all the record information from the **Records List**. Both the record and its data are removed from the system.

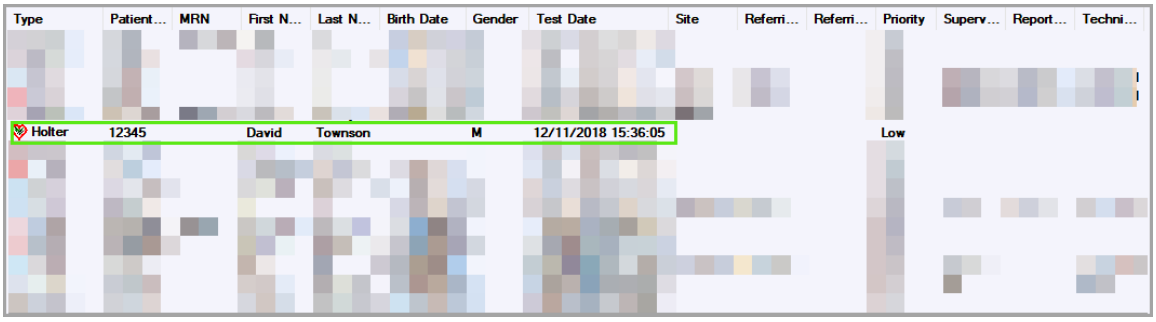
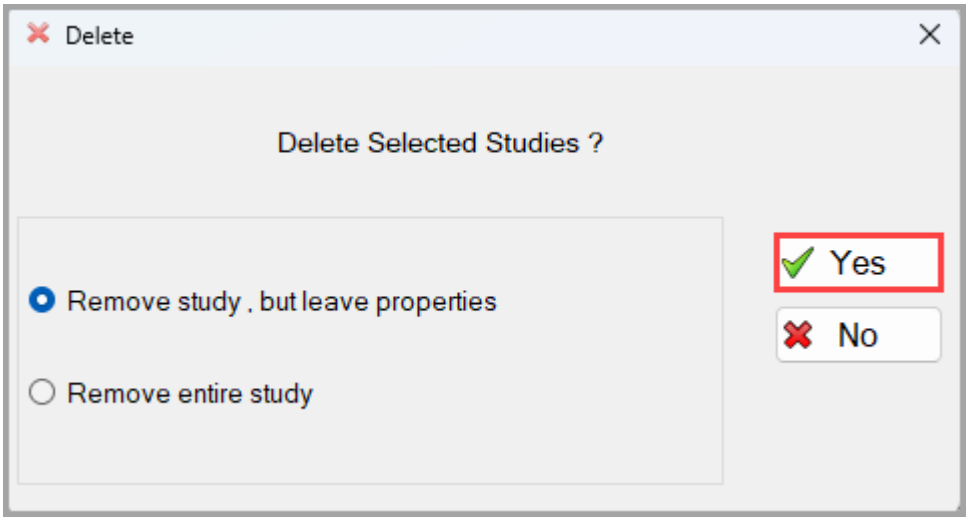


Figure **118**. Records Tab - Delete - Record and Data Removed

Note: Use this option of the **Delete** action to completely remove a record's data if you previously moved or deleted a record using the "**Remove study, but leave properties**" option. This option is available for both the **Move** and **Delete** actions.

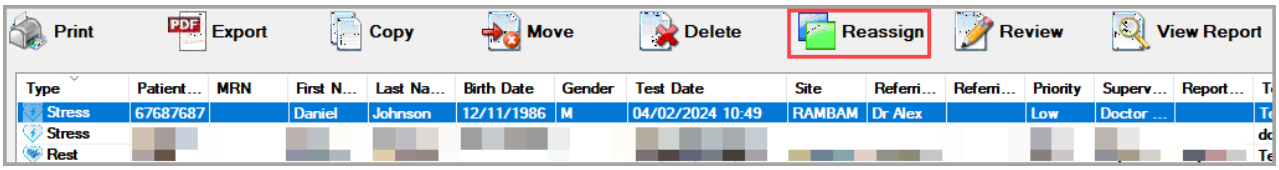
4. Click **Yes** to confirm your choice and remove the record.

Figure **119**. Records Tab - Delete - Removing Record



Reassigning Records
To reassign a patient's record:

Figure **120**. Records Tab - Actions Bar - Reassign



1. Select a record in the **Records List**.
2. Click the **Reassign** button in the **Actions Bar**. The **Reassign test to another patient** dialog box will be displayed.

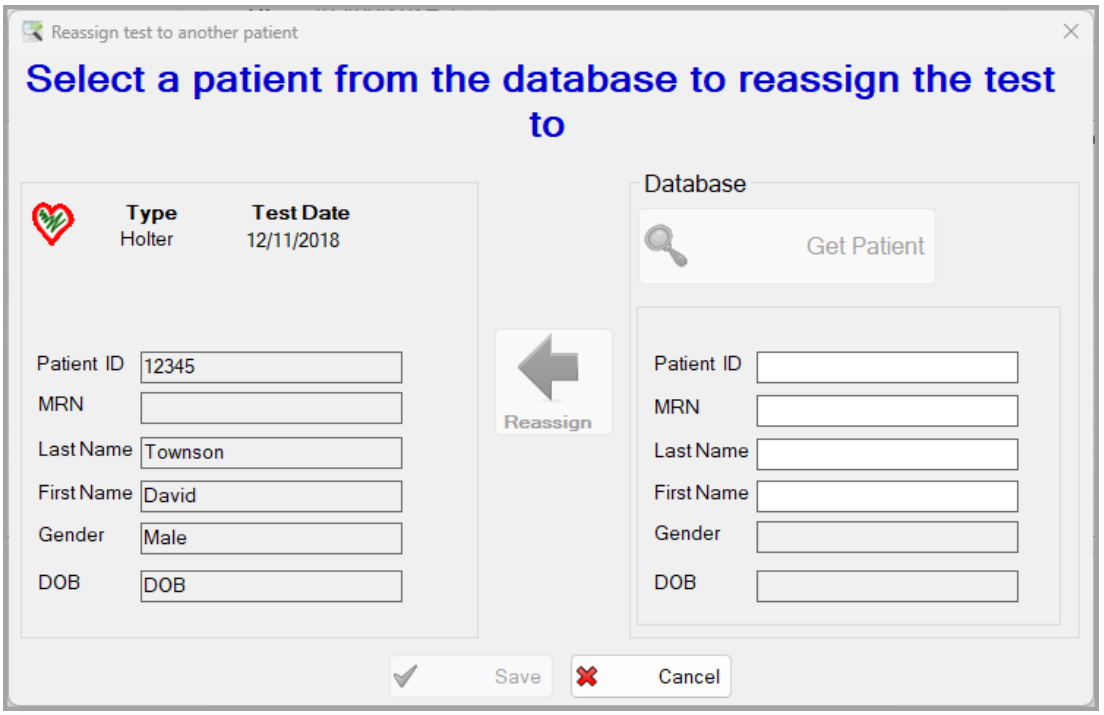


Figure **121**. Records Tab - Reassign - Reassign Dialog Box

3. Enter any of the patient credentials in the **Patient ID**, **MRN**, **Last Name**, or **First Name** search fields within the dialog box. To perform a search, you must enter at least one character in one of these fields. You can also enter values in multiple fields to refine your search using different parameters. For example, you may enter "1" in the **Patient ID** search field to get a list of all patients with IDs containing "1."

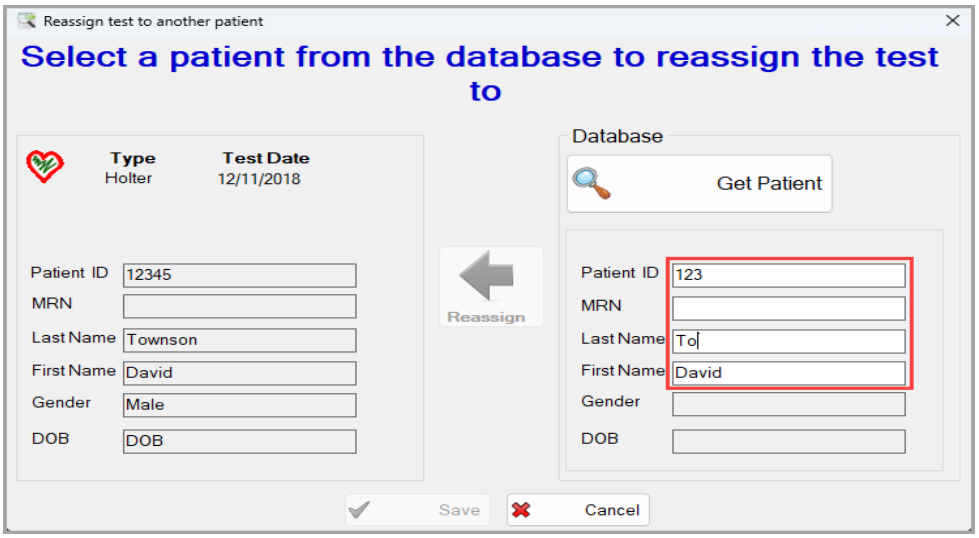
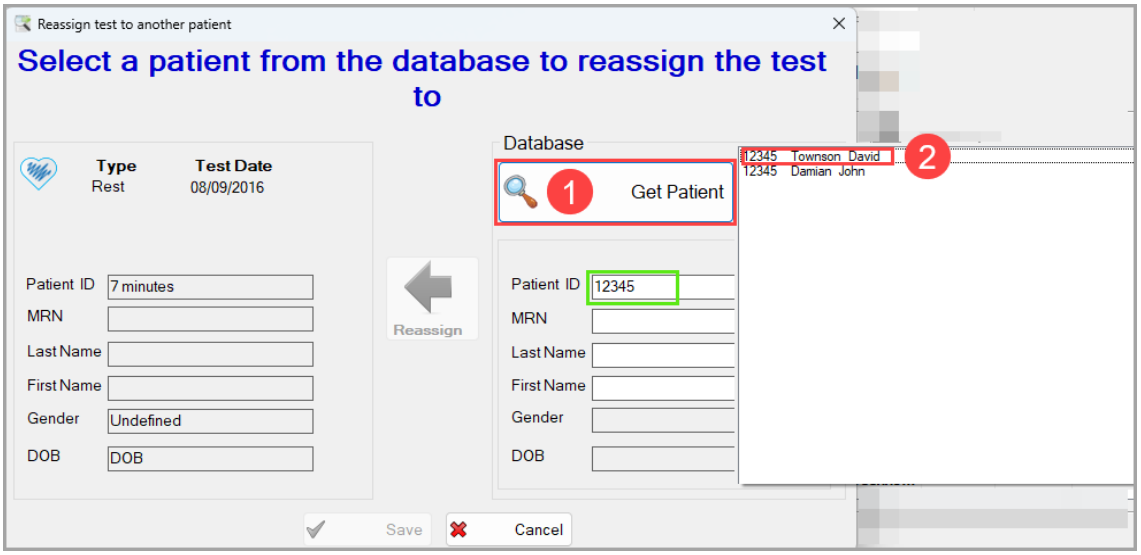


Figure **122**. Records Tab - Reassign - Entering Search Parameters

Note: The **Gender** and **DOB** (Date of Birth) fields are for display purposes only and will be populated with search results. These fields cannot be used to search for patients.

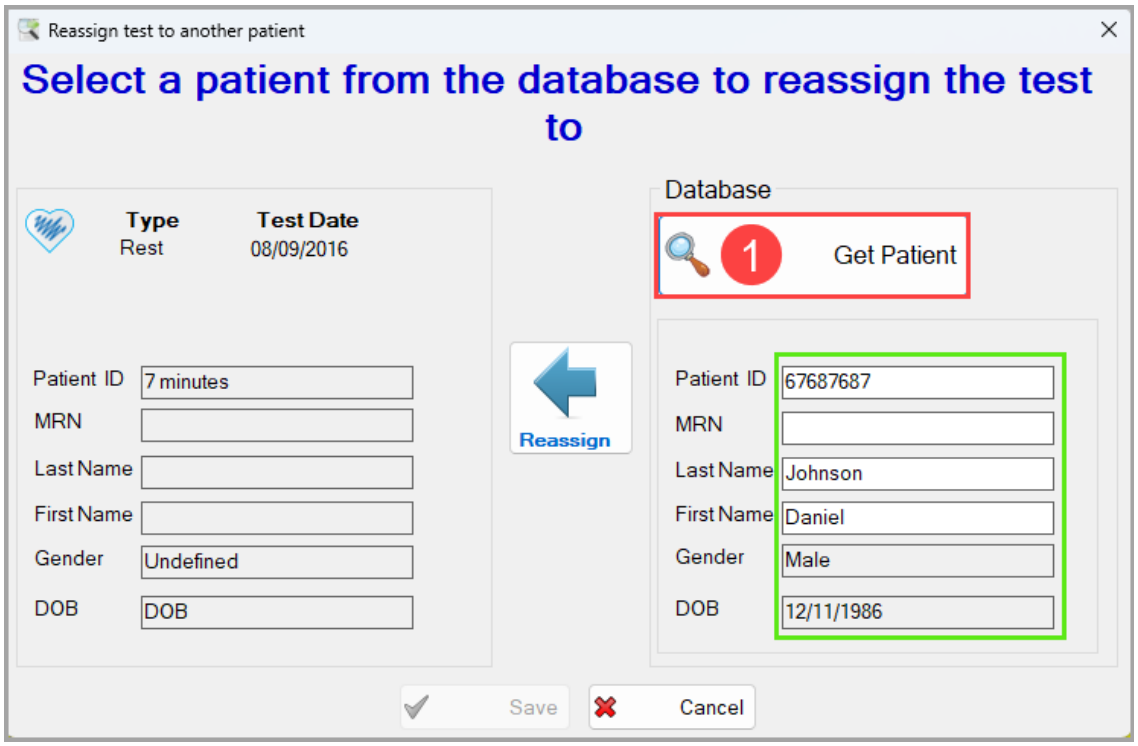
4. Click the **Get Patient** button when you have entered all the search values you wanted:
   - If your search parameters return multiple matches, a list of potential matches will be displayed to the right of the dialog box. Click the result you are looking for, and the relevant text fields within the **Database** section will be populated with the match's data.

     Figure **123**. Records Tab - Reassign - Multiple Matches



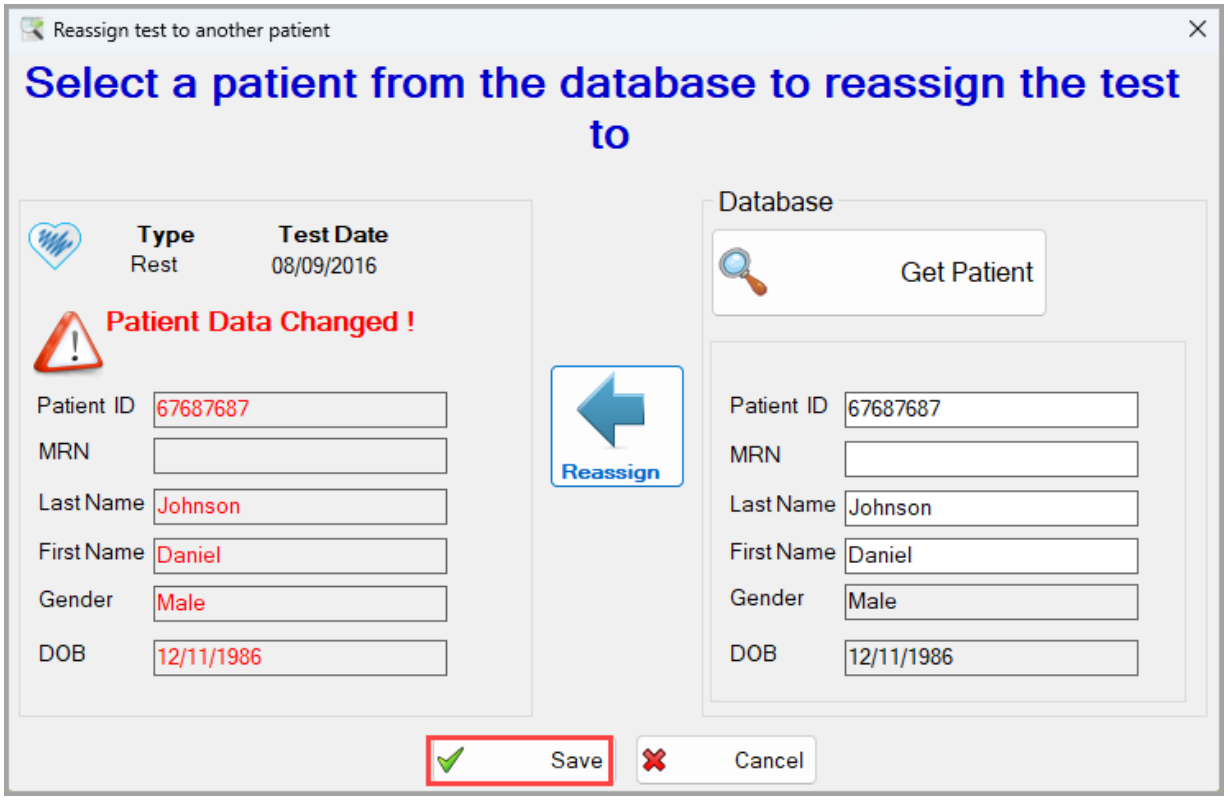
   - If your search parameters return an exact match, the relevant text fields within the **Database** section on the right will be populated with the match's data. In this case, no list of matches will be displayed.

     Figure **124**. Records Tab - Reassign - Exact Match



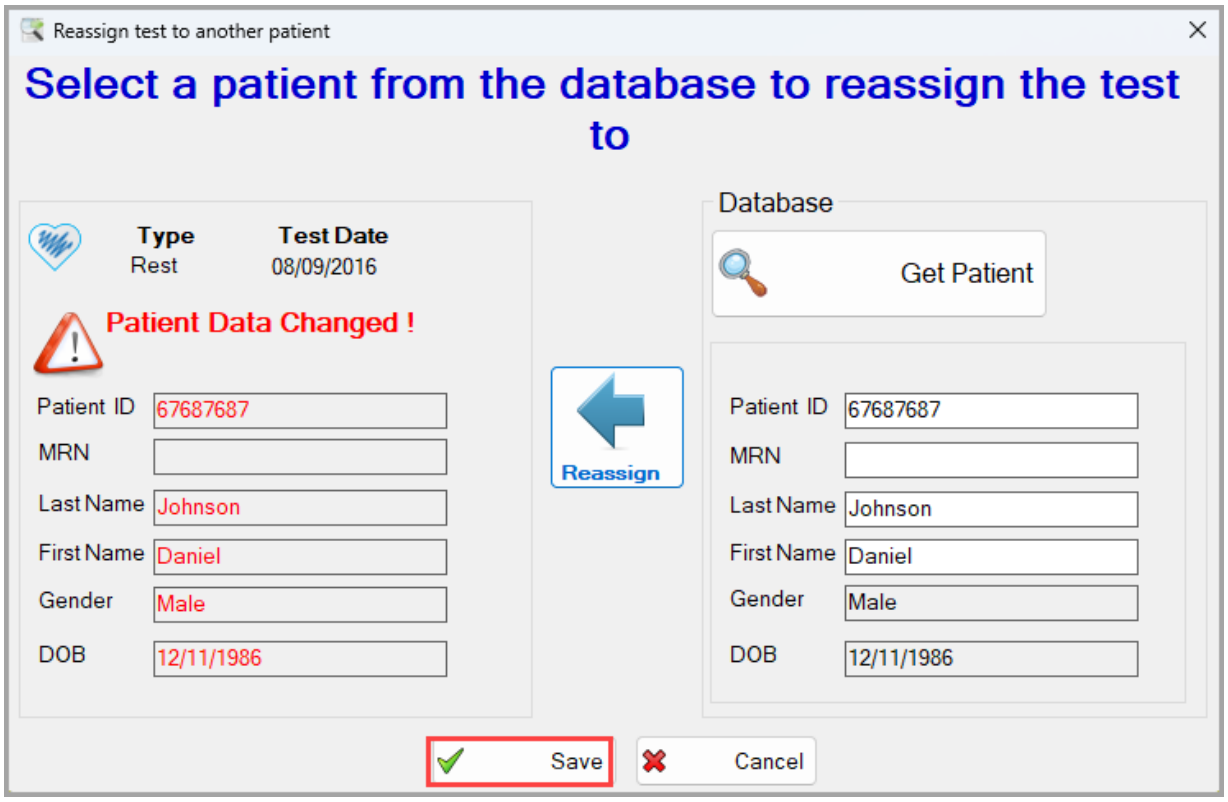
5. Click the **Reassign** button to assign the record on the left to the patient displayed on the right. A "**Patient Data Changed**!" warning will appear on the left side of the dialog box, and the updated patient's data will be highlighted in red.

Figure **125**. Records Tab - Reassign - Reassign



6. Click the **Save** button to save the record with the new patient's data, reassigning it to the new patient.

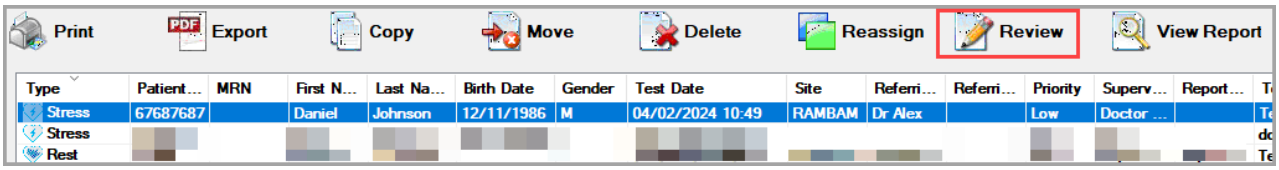
Figure **126**. Records Tab - Reassign - Save



Reviewing Records

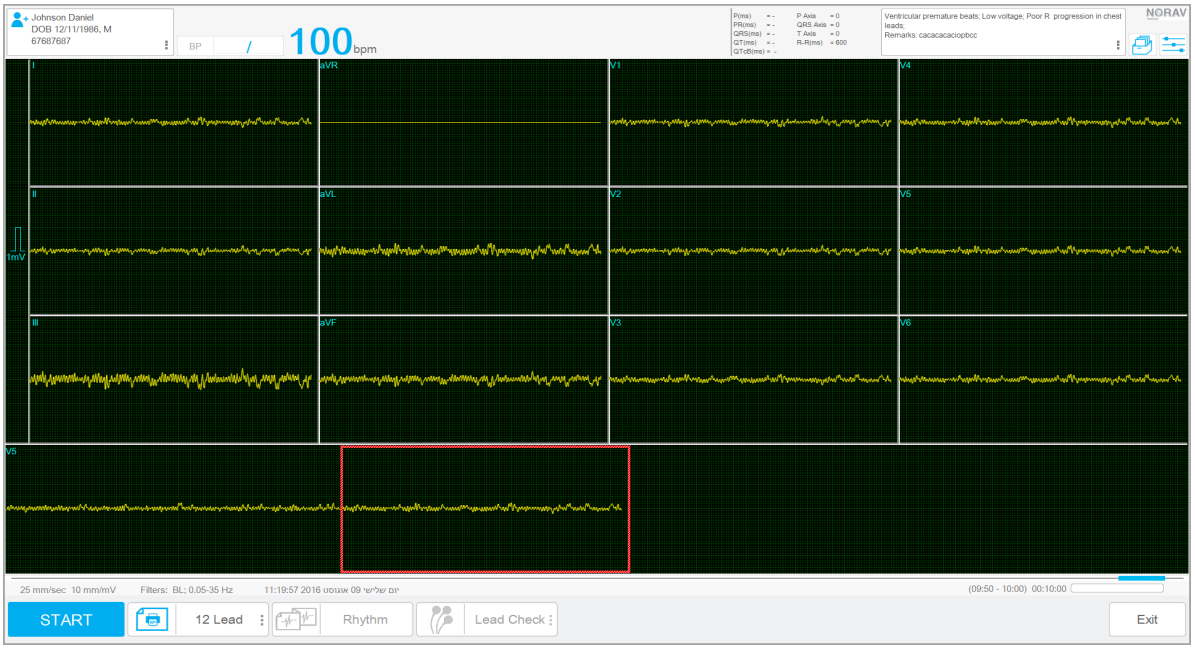
To review a record:

Figure **127**. Records Tab - Actions Bar - Review



1. Select a record in the **Records List**.
2. Click the **Review** button.
3. Depending on the **Type** of record, the corresponding app will be launched:
   - **PC-ECG 1200:** For Rest and Stress records.

     Figure **128**. Records Tab - Review - Rest Application Launched



   - **NH-301:** For Holter records.

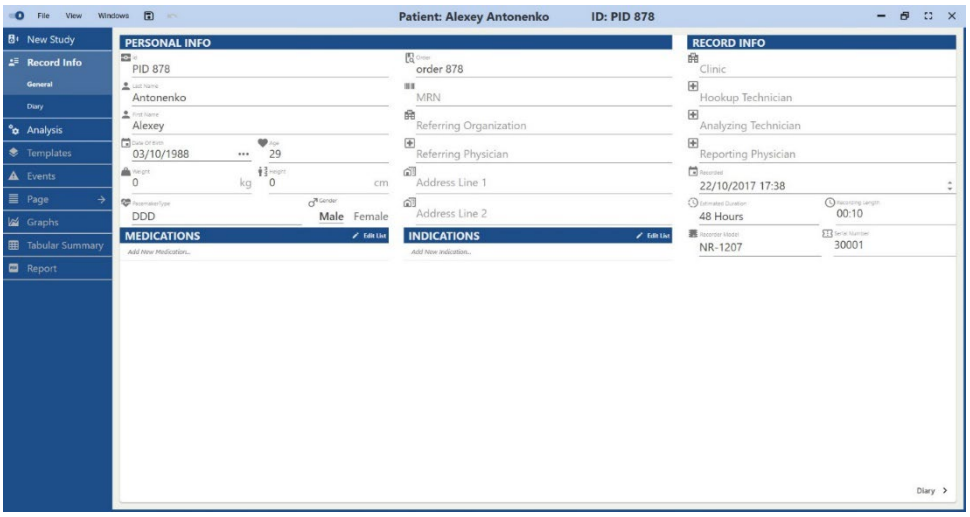
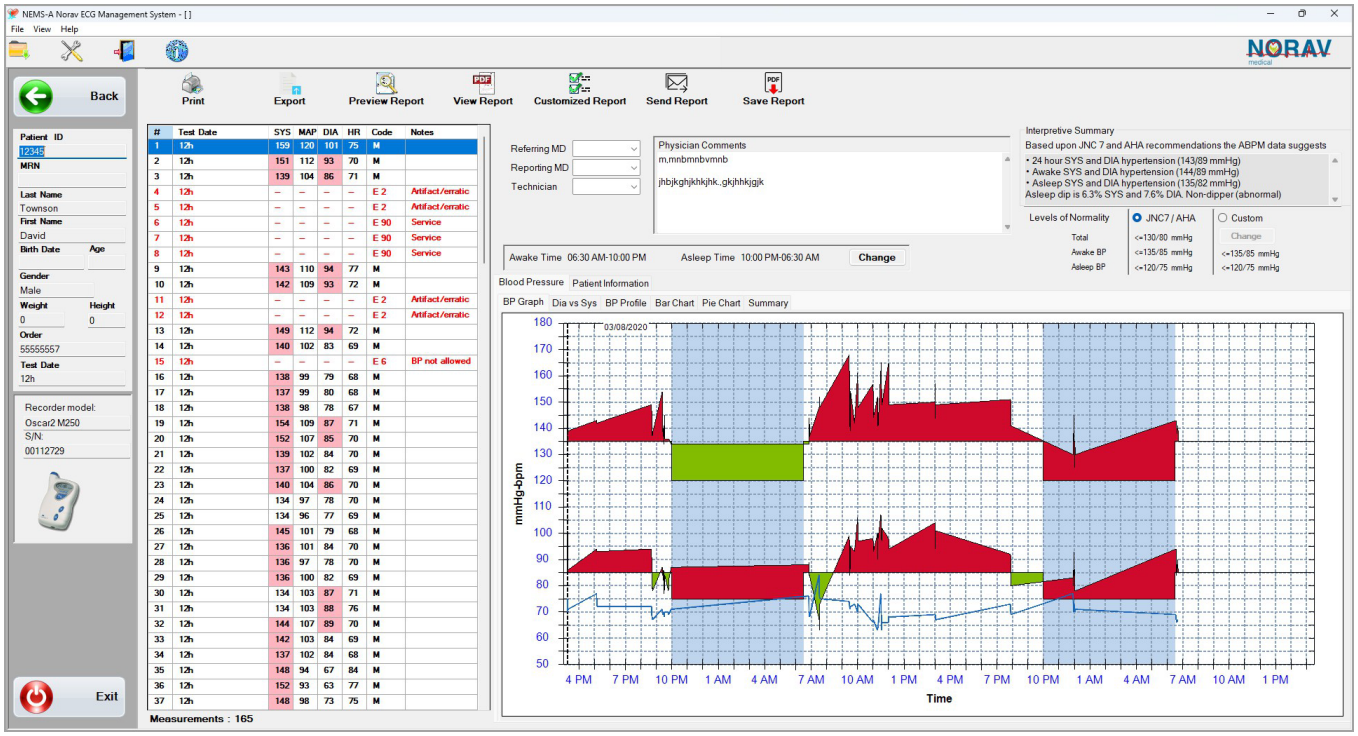


   Figure **129**. Records Tab - Review - NH-301 Application Launched
   - **NEMS-A:** ABPM records are opened directly within the NEMS-A application, with no external or additional apps needed.

Figure **130**. Records Tab - Review - Reviewing ABPM Record

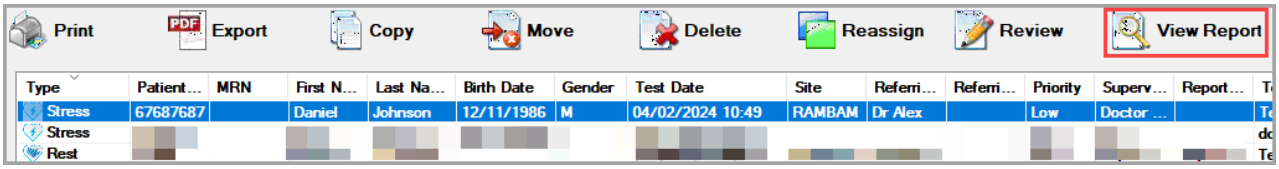


4. Wait until the relevant app is launched and the selected record is loaded for review. Proceed with the review after that.
5. **(Optional)** If you launched the **PC-ECG 1200** (Stress, Rest) or **NH-301** app, you may need to close it after reviewing a record:
   - **Stress and NH-301:** Use **File > Exit** option or the standard Windows **Close** button.
   - **Rest:** Click the **Exit** button in the bottom-right corner.

Viewing Reports

To view a report associated with a patient's record:

Figure **131**. Records Tab - Actions Bar - View Report

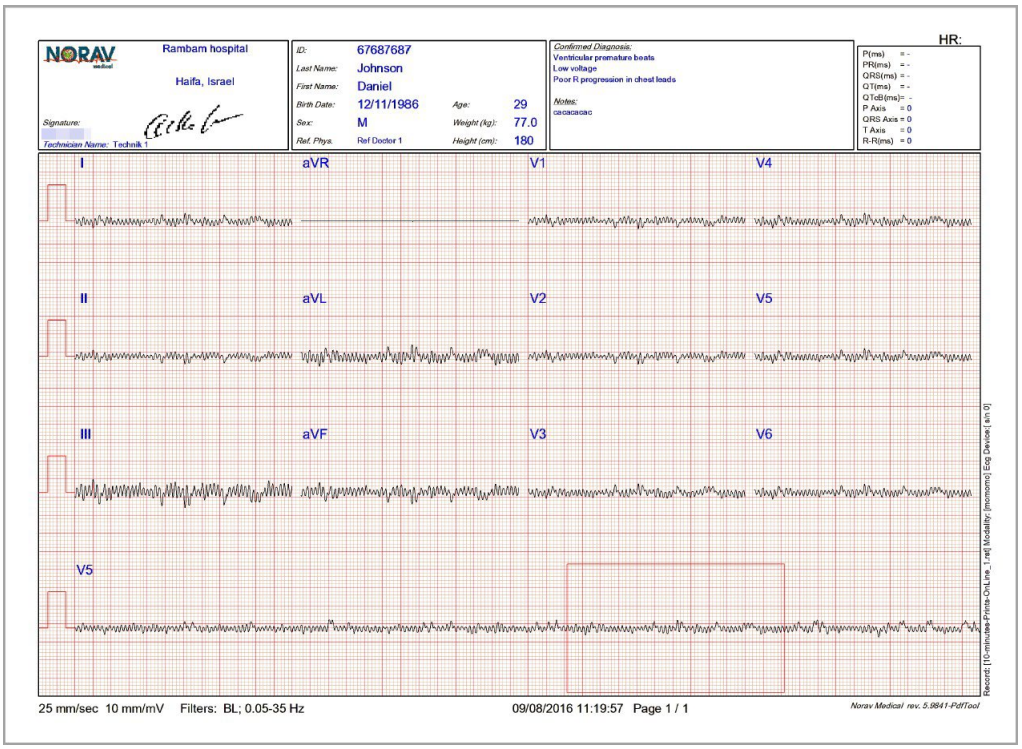


1. Select a record in the **Records List**.
2. Click the **View Report** button.
3. If you have opted to view a **Rest**, **Stress**, or **Holter** report, a progress indicator pop-up will be displayed.

Figure **132**. Records Tab - View Report - Progress Indicator

4. After a short period of time, the report associated with the selected record will be opened:
   - **For Rest, Stress, and Holter reports:** In the PDF viewer installed on your PC.

Figure **133**. Record Tab - View Report - Stress Report

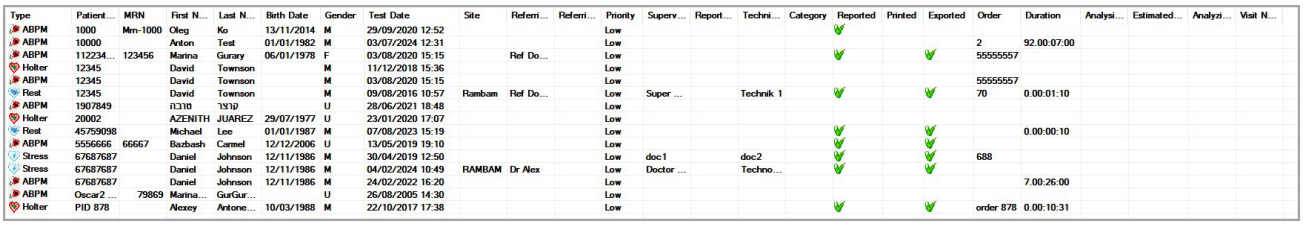


- **For ABPM reports:** Directly within the NEMS-A system.

Records List

Records List is an essential part of the**Records** tab, containing all the records' data displayed within appropriate columns. Within the **Records List**, you can sort the records using column headers and the context menu, turn columns ON and OFF to your liking, access records' properties, and more.

Figure **134**. Records Tab - Records List



Managing Columns

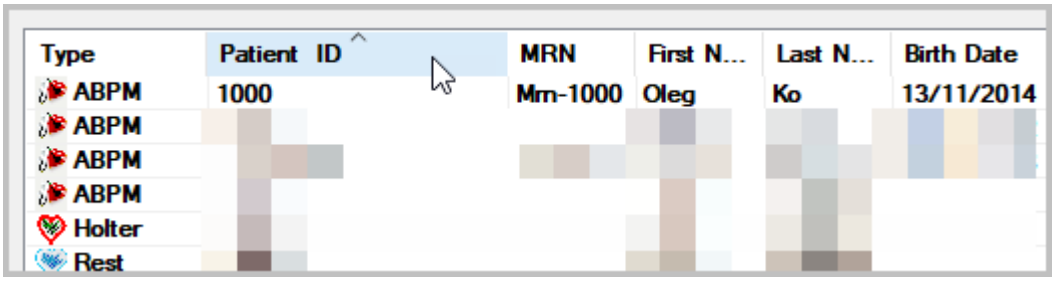
Records List enables users to sort records using column sorting functions. Column sorting toggles the sorting order in a column between ascending and descending and allows users to revert back to the default ("unsorted") state. After changing the order in a column, all records in the list will be rearranged accordingly.

Users can also arrange columns in the preferred order and turn them ON/OFF, including fields like **Patient ID**, **First Name**, **Last Name**, **Test Date**, and others.

To toggle column sorting order:

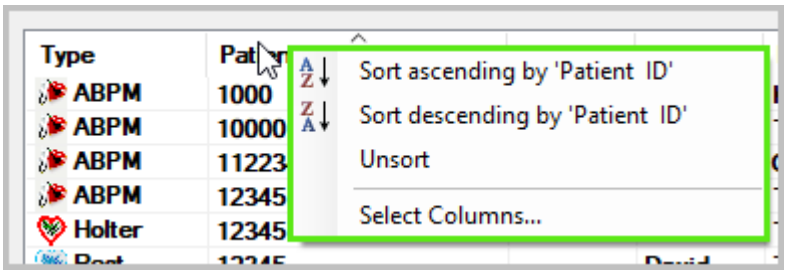
1. Hover your mouse cursor over the header of a column you want to use for sorting (e.g., the Patient ID column).
2. Change the sorting order using one of the following methods:
   - Click the column header to switch between sorting orders. The records will be rearranged in the corresponding order (ascending or descending). The arrow icon on top of the column header will change accordingly.

Figure **135**. Records Tab - Records List - Switching Sorting Order



- Right-click a column header to open the context menu and select one of the available options: **Sort ascending by**, **Sort descending by**, or **Unsort**. The **Unsort** option reverts the sorting to the "default" sorting state.

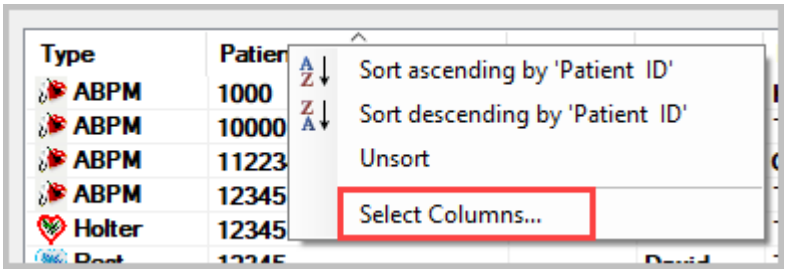
Figure **136**. Records Tab - Records List - Column Header Context Menu



To turn columns ON/OFF or adjust the visibility of displayed columns:

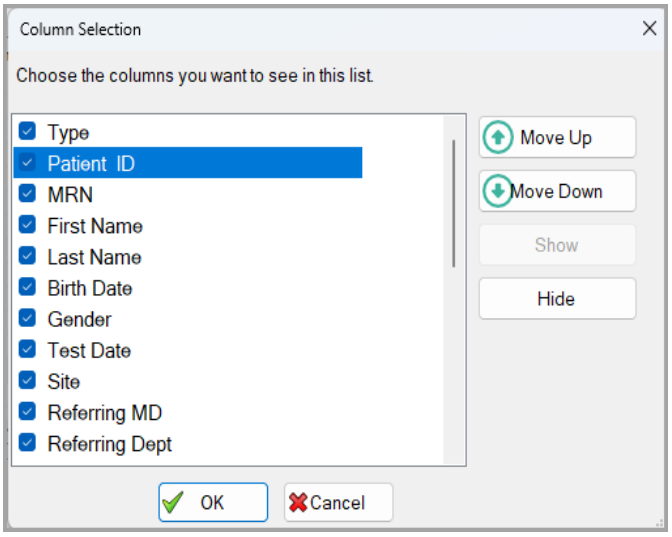
1. Right-click a column header to open the context menu.

Figure **137**. Records Tab - Records List - Select Columns



2. Click on the **Select Columns** option. The **Column Selection** dialog box will be displayed.

Figure **138**. Records Tab - Records List - Column Selection Dialog Box



3. **(Optional)** To toggle any of the 25 available columns ON/OFF, excluding the **Type**

column:
   - Click a checkbox next to the relevant column name (e.g., **Patient ID**, **First Name**, **Test Date**) to toggle it ON or OFF.
   - Select a column to toggle ON/OFF and click the **Show** or **Hide** button on the right to display or hide this column.
4. **(Optional)** To move a column forward (up in the list) or backward (down in the list) in the records list:
   - Select a column to move and click **Move Up** on the right to shift it one position up in the dialog box and forward in the records list. This action can be repeated multiple times.
   - Select a column to move and click **Move Down** to shift it one position down in the dialog box and backward in the records list. This action can be repeated multiple times.
5. Click **OK** to save the changes.

Note: The **Type** column cannot be turned off as it contains data about the test type. You can only change the position of this column using the **Move Up** and **Move Down** buttons in the **Column Selection** dialog box.

Managing Records

Records List also provides the capability to select or deselect all records and presents comprehensive data about the records through a dedicated context menu.

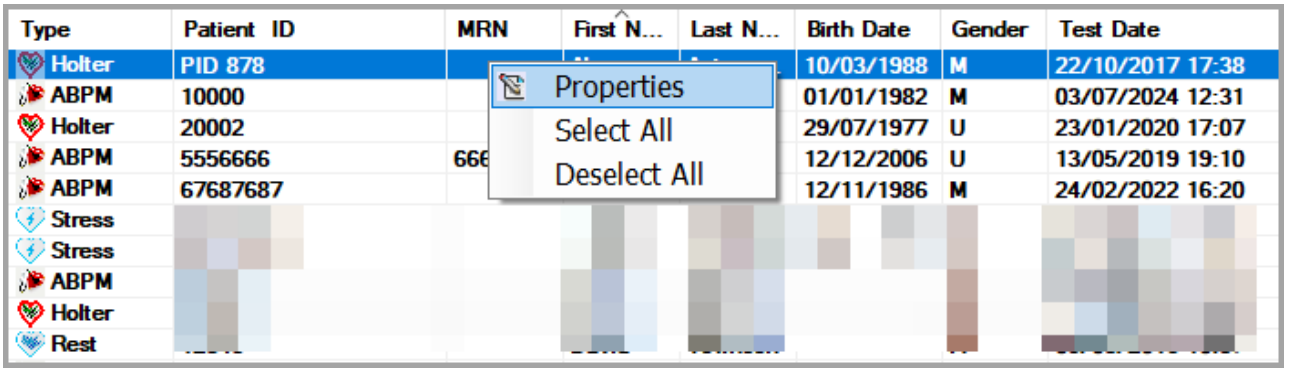


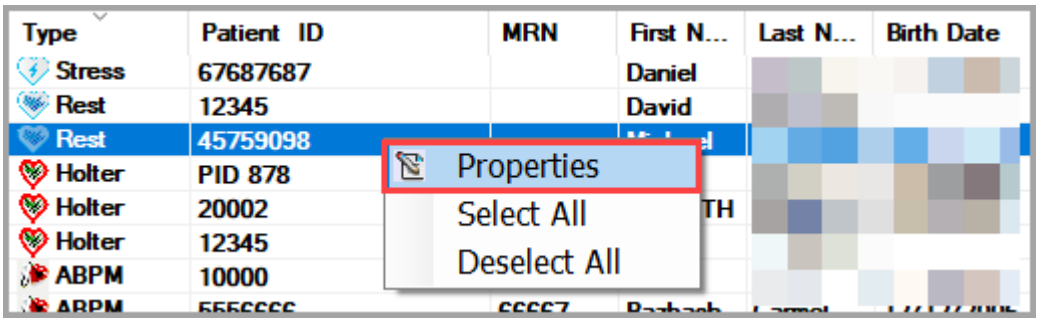
Figure **139**. Records Tab - Records List - Records List Context Menu

Option	Description
Properties	Click this option to access the details of the selected record.
Select All	Click this option to select all records in the **Records List** for bulk actions.
Deselect All	Click this option to deselect all records in the **Records List**.

To access record details:

1. Hover over the specific record you want to obtain data about.
2. Right-click to open the context menu.

Figure **140**. Records Tab - Records List - Properties



3. Click **Properties**. The **Properties** pop-up window will be displayed.
4. Switch between the **General**, **File**, and **Description** tabs to access relevant record details. Please find more information on the tab content below.

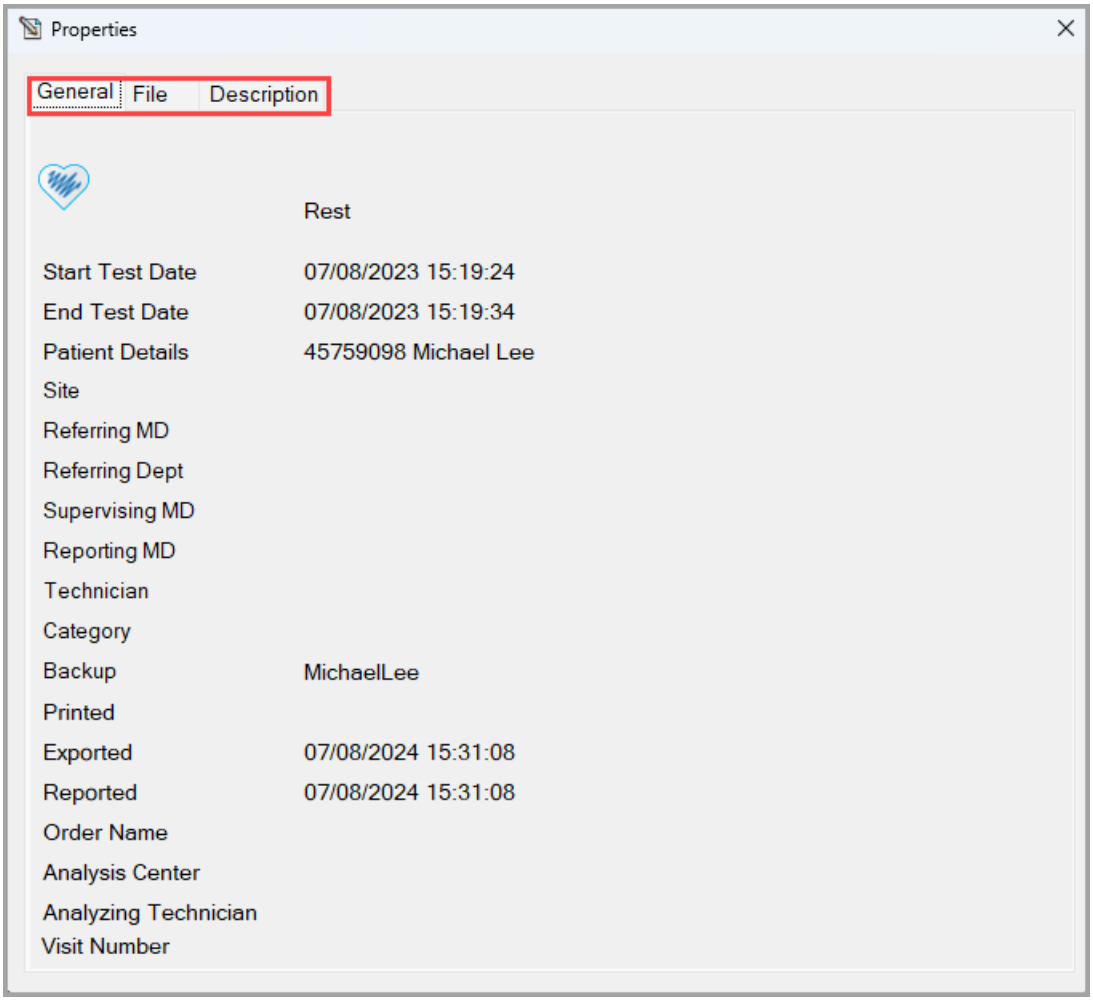


Figure **141**. Records Tab - Records List - Properties

The **General** tab of the **Properties** pop-up contains standard record data visible in the **Records List**, such as test type, start and end test date, patient details, referring physician, etc., along with some additional information, as shown in the image below.

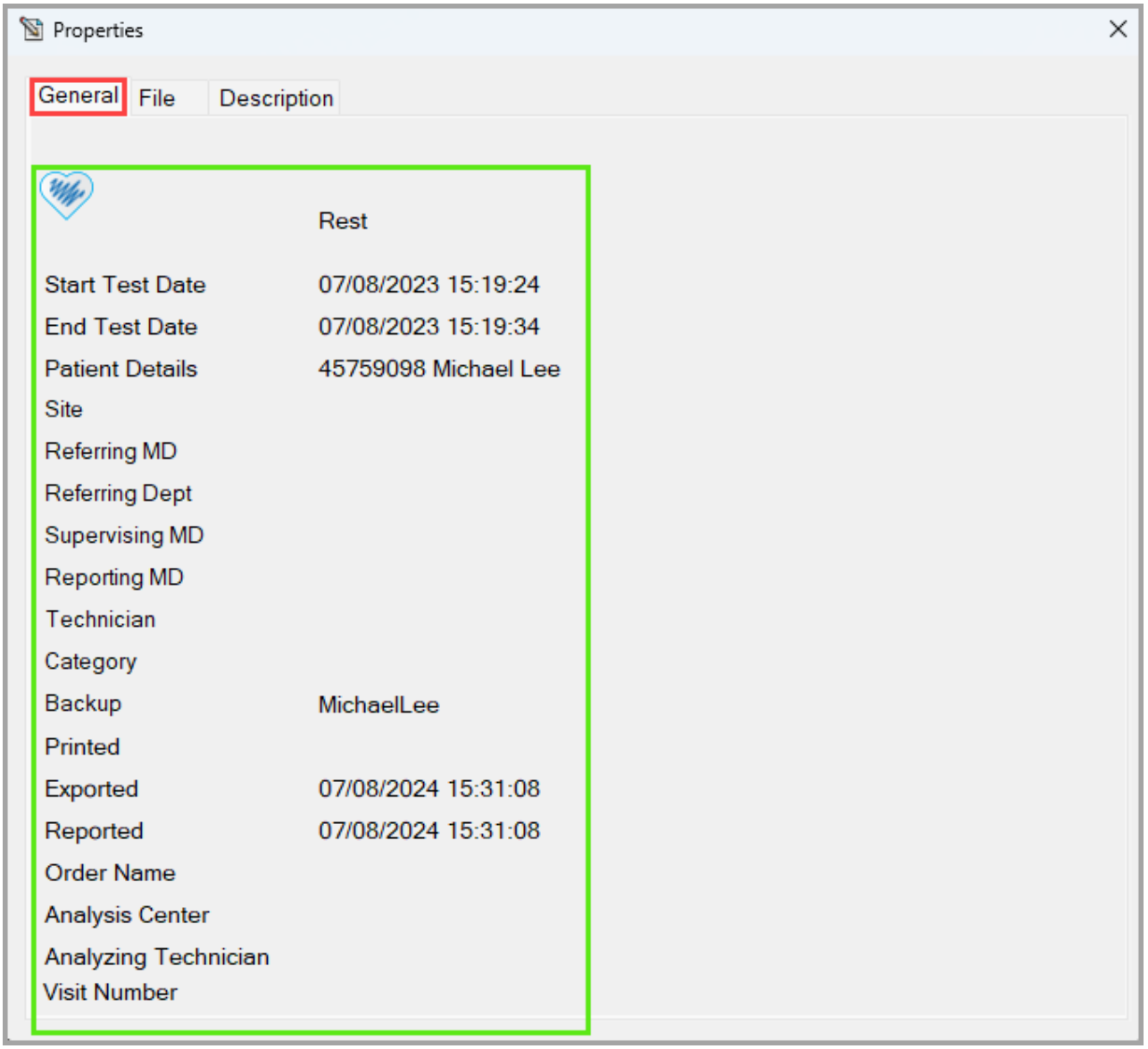


Figure **142**. Records Tab - Records List - General Tab

The **File** tab contains the test file data:

- **File Name:** Name of the file containing the test.
- **File Date:** The date when it was created or imported into the system.
- **Path:** Full path to the file.
- **Size:** The size of the file in bytes.
- **Report Name:** The name of the report associated with the test file.

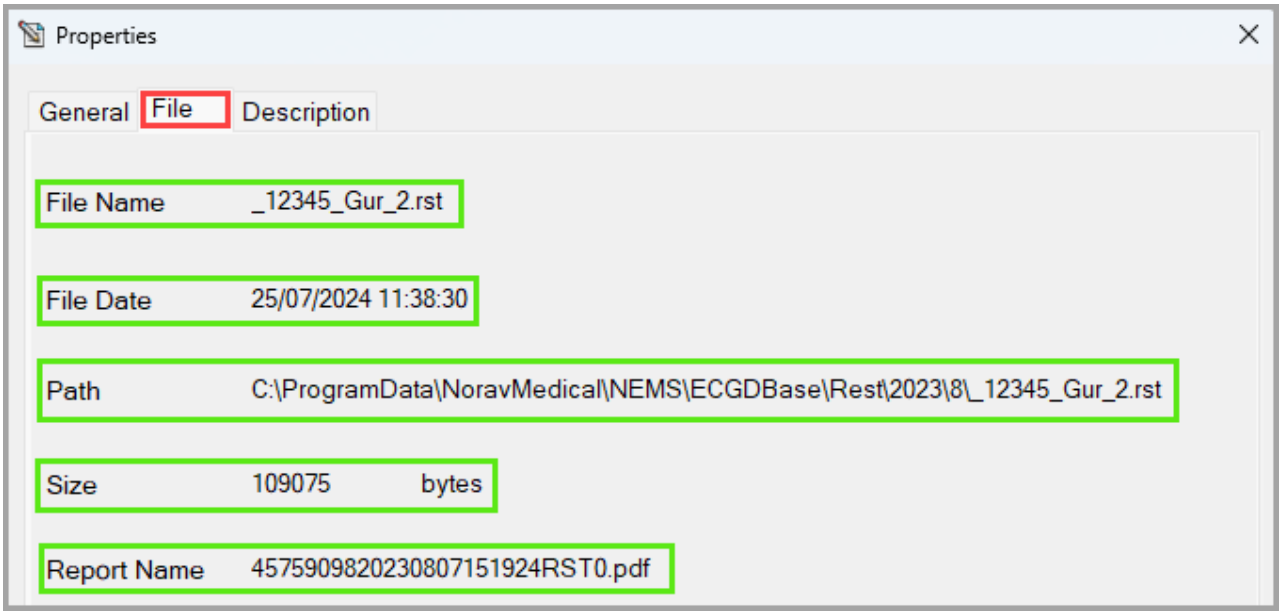
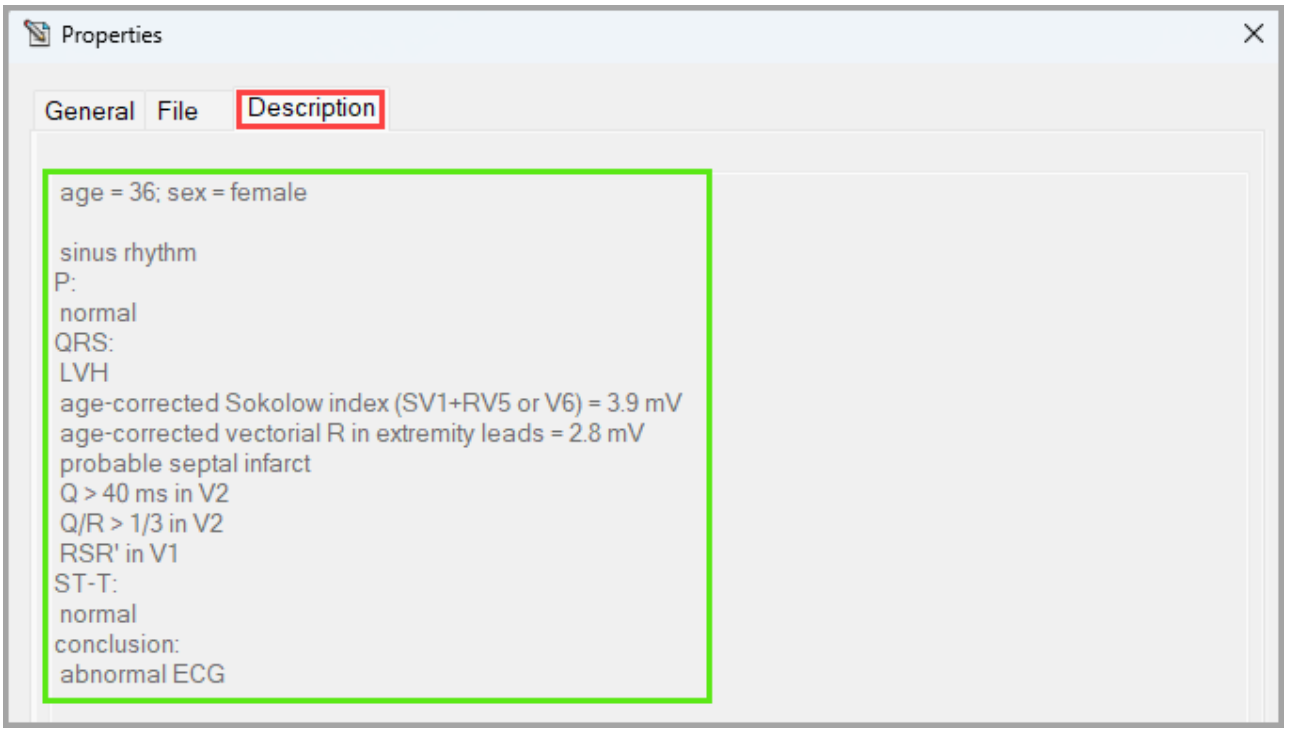


Figure **143**. Records Tab - Records List - File Tab

The **Description** tab contains the test conclusion and remarks made by the medical personnel within the relevant application.

Figure **144**. Records Tab - Records List - Description Tab



Preview Panel

The **Preview Panel** facilitates fast preview of example strips from Rest ECGs (not available for Stress) or blood pressure tests (ABPM), derived from the record.

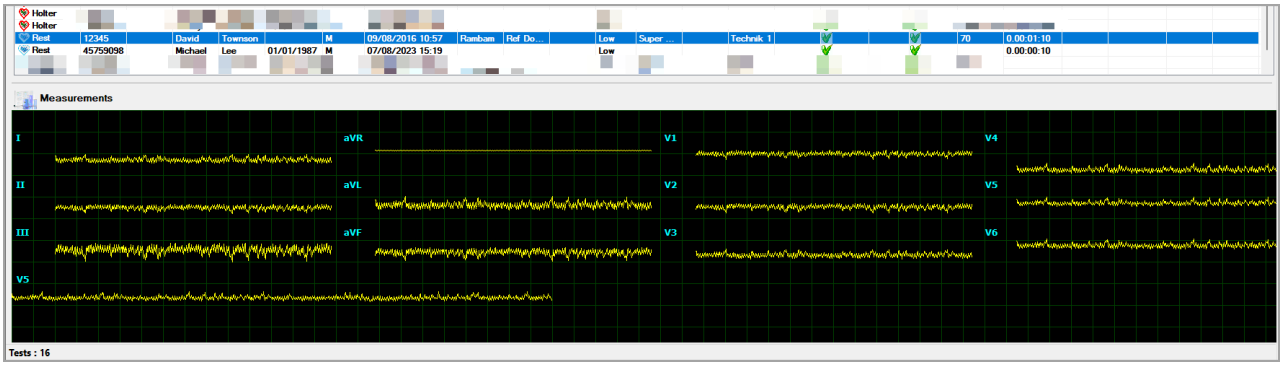


Figure **145**. Records Tab - Preview Panel - Rest Example Strip

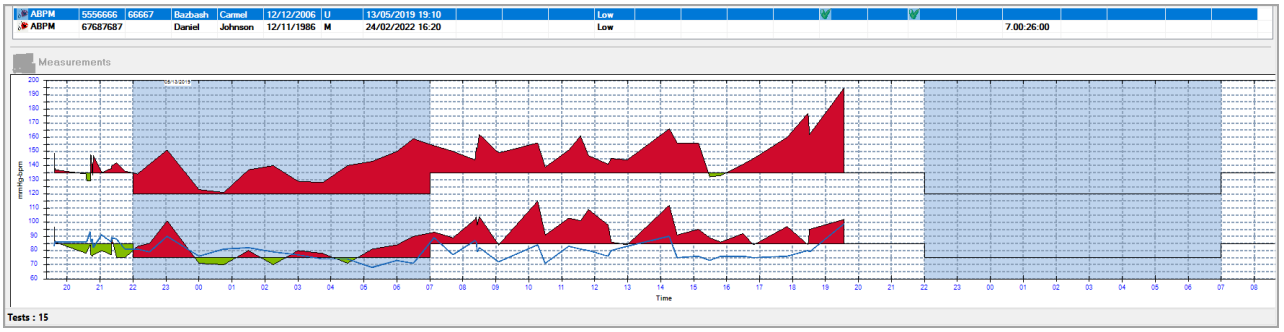
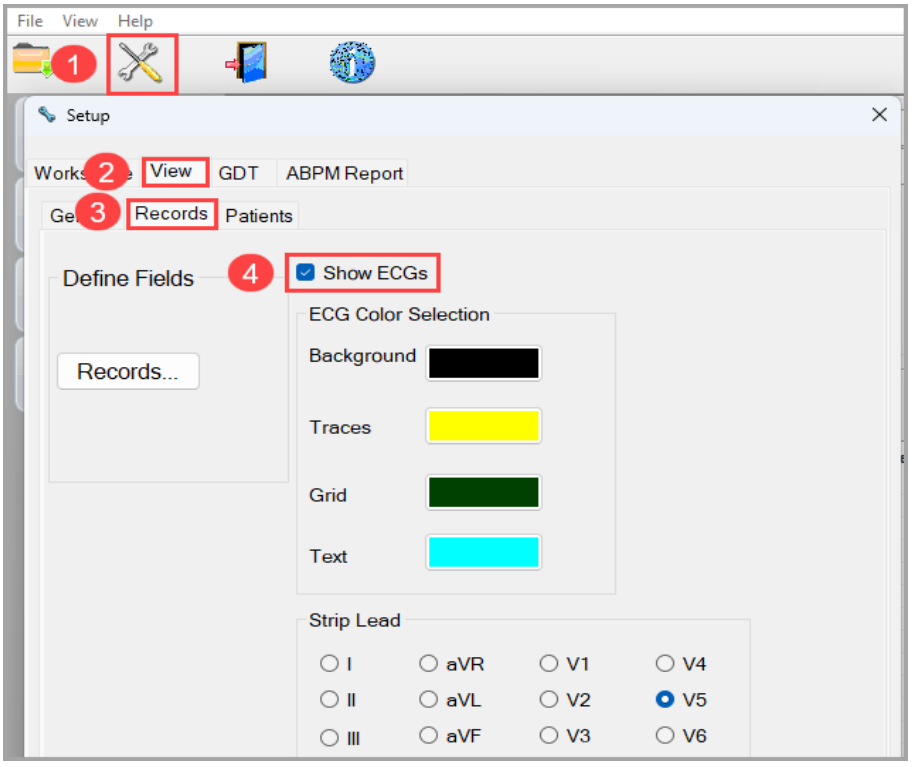


Figure **146**. Records Tab - Preview Panel - ABPM Example Strip

The **Preview Panel** is a **Records** tab element that can be turned ON or OFF. To turn the **Preview Panel** ON, check the checkbox next to the **Show ECGs** option in the **View** tab of the **Setup** dialog box (**Setup > View > Records Tab**). For more detailed instructions on how to turn the **Preview Panel** ON/OFF, refer to the **View** tab section.

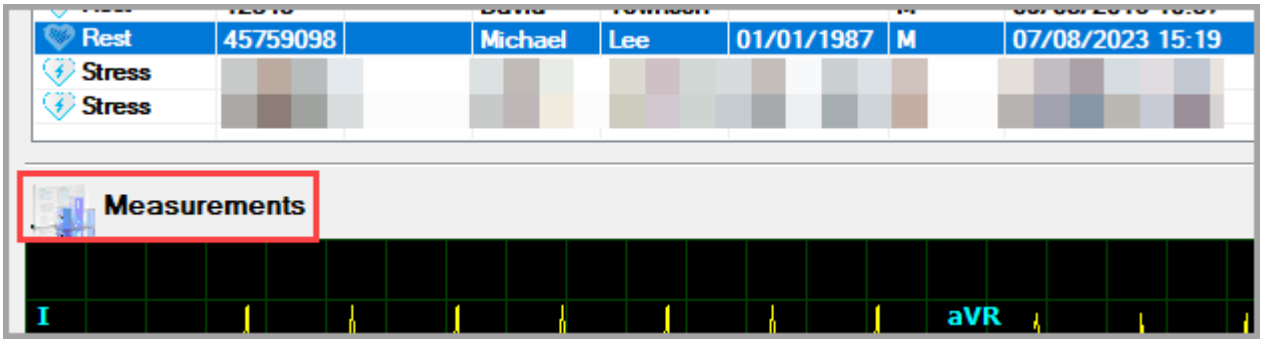
Figure **147**. Setup - View - Records - Show ECGs



Measurements Function

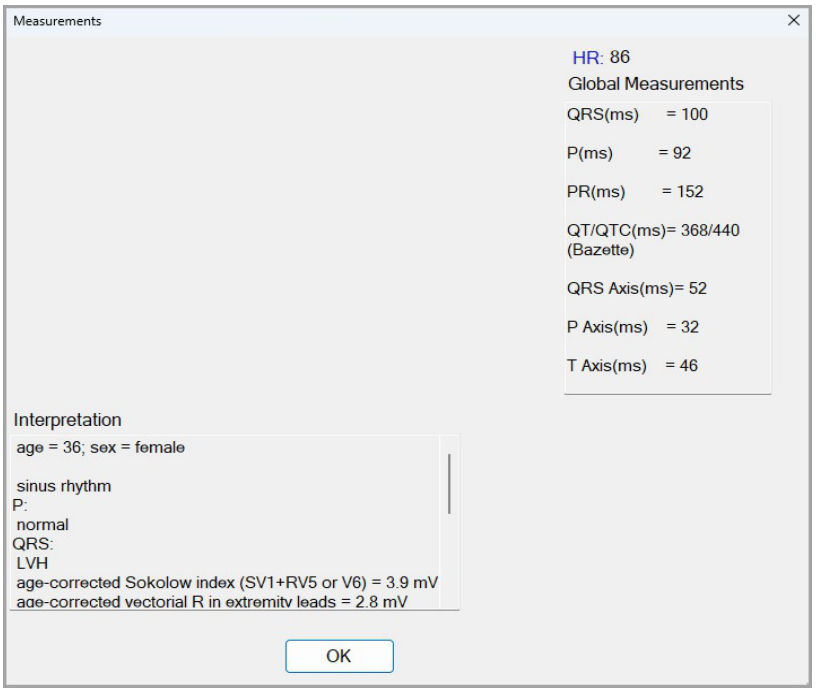
When the **Preview Panel** is turned ON, you can see the **Measurements** button in the upper-left corner, right above the panel itself. This button is only active when a Rest record is selected in the **Records List**.

Figure **148**. Records Tab - Preview Panel - Measurements Button



Click the **Measurements** button to open the **Measurements** window. It provides fast access to test measurements and interpretation without the need to review the test within the Rest application.

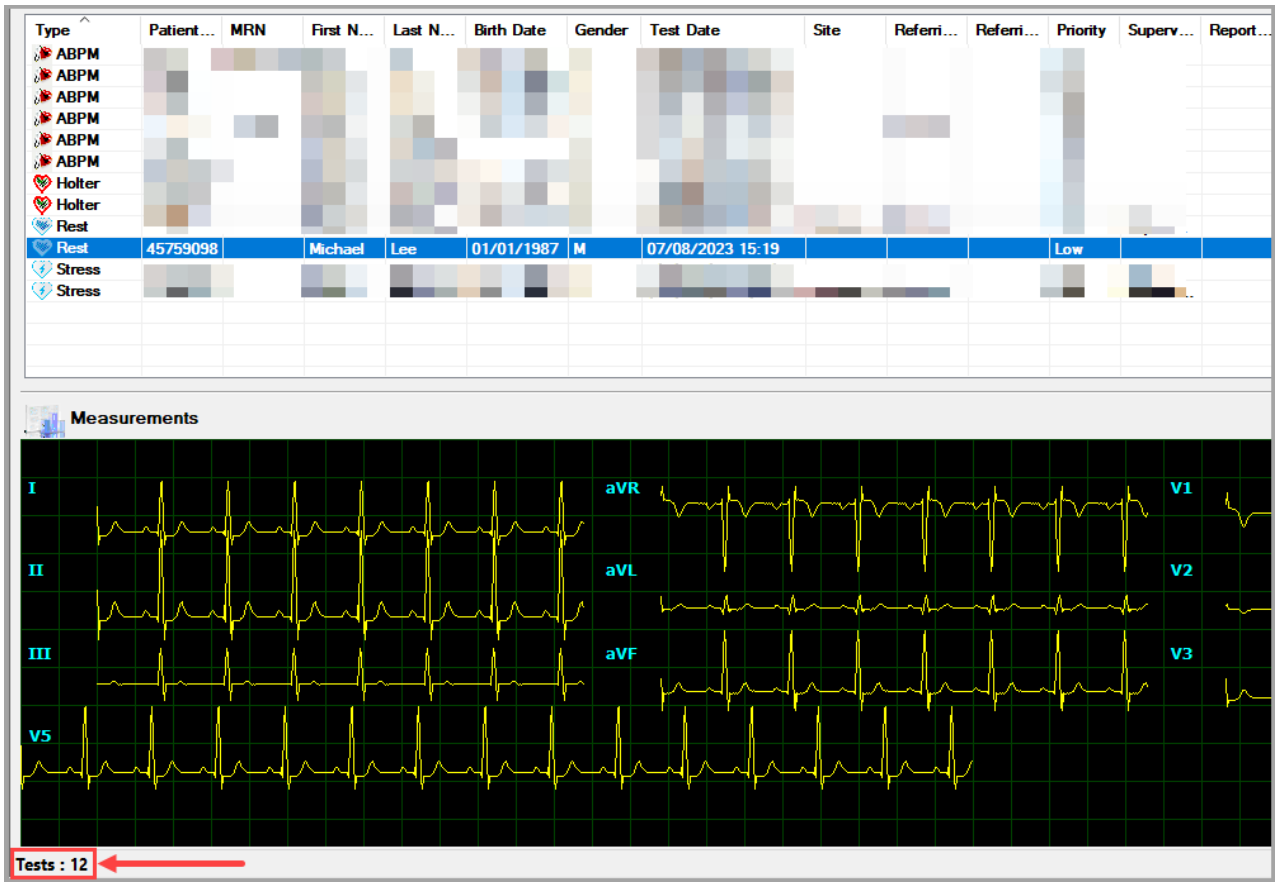
Figure **149**. Records Tab - Preview Panel - Measurements Window



Records Counter

The **Records Counter** is located in the bottom-left corner of the **Records** tab, right below the **Preview Panel** (when it's turned ON). It displays the number of records (tests) shown in the **Records List** at any given moment. In other words, it shows the number of records based on the search criteria selected by the user in the **Filters Pane**.

Figure **150**. Records Tab - Preview Panel - Records Counter



Patients Tab

The purpose of the patient module is to manage the patients, search for specific patient or group of patient, view the patient tests (records), and perform actions on specific tests (e.g., View, Compare, Review).

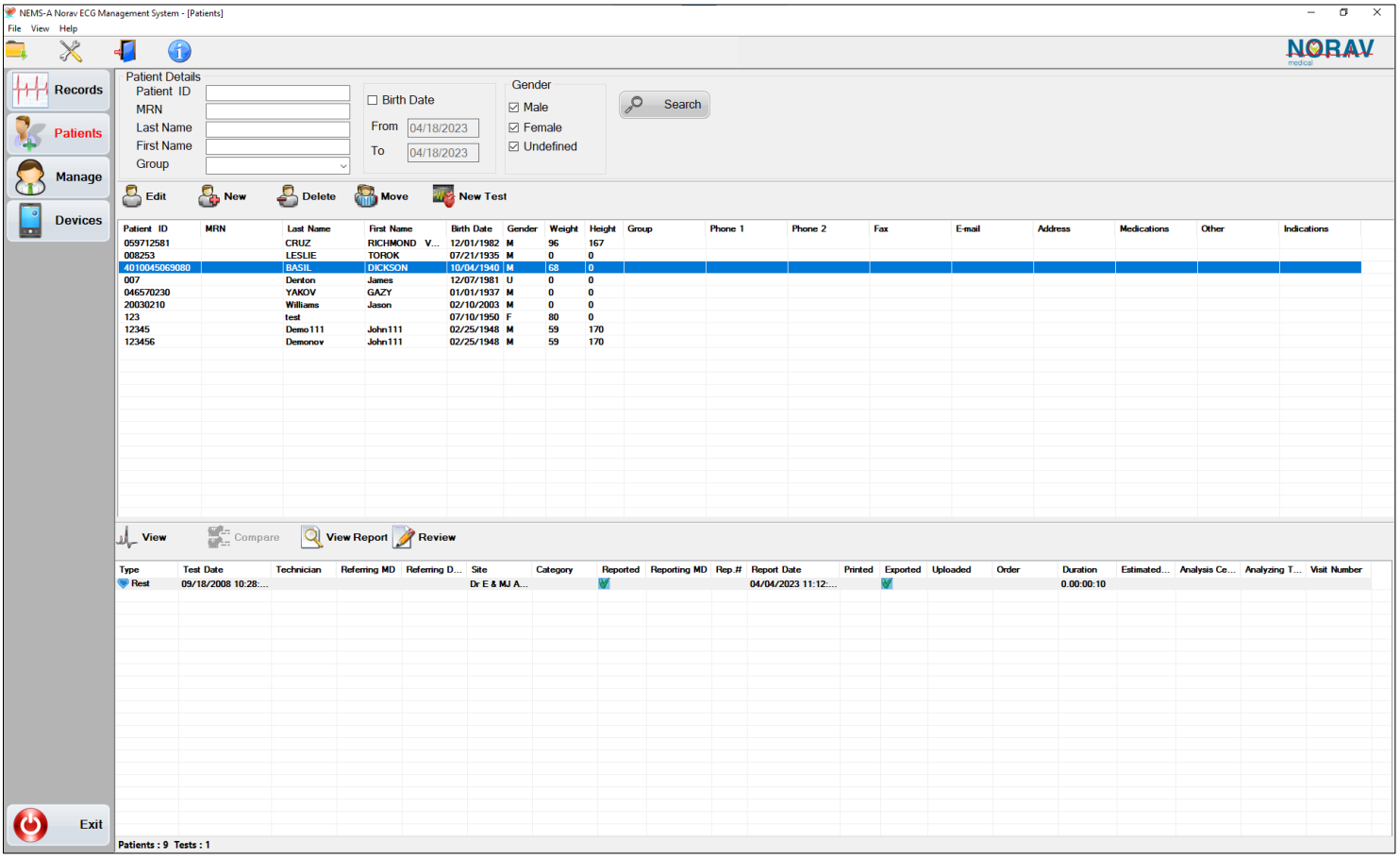


Figure 151: Patients Screen

Patients Tab Buttons

Tab	Description
Edit	Editing patient details
New	Adding new patient
Delete	Deleting patient
Move	Moving patient to another group
New Test	Creating new test for selected patient
View	Viewing patient's test
Compare	Comparing patient's tests
View Report	Viewing the selected report
Review	Reviewing the selected test

Editing Patient

The system administrator can change the patient demographic information in case of missing details or wrong input. To change the patient information, follow the next steps:

1. To edit the patient details (administrator only), select (highlight) the patient, and click Edit.

   The **Patient Details** Dialog Box is displayed.

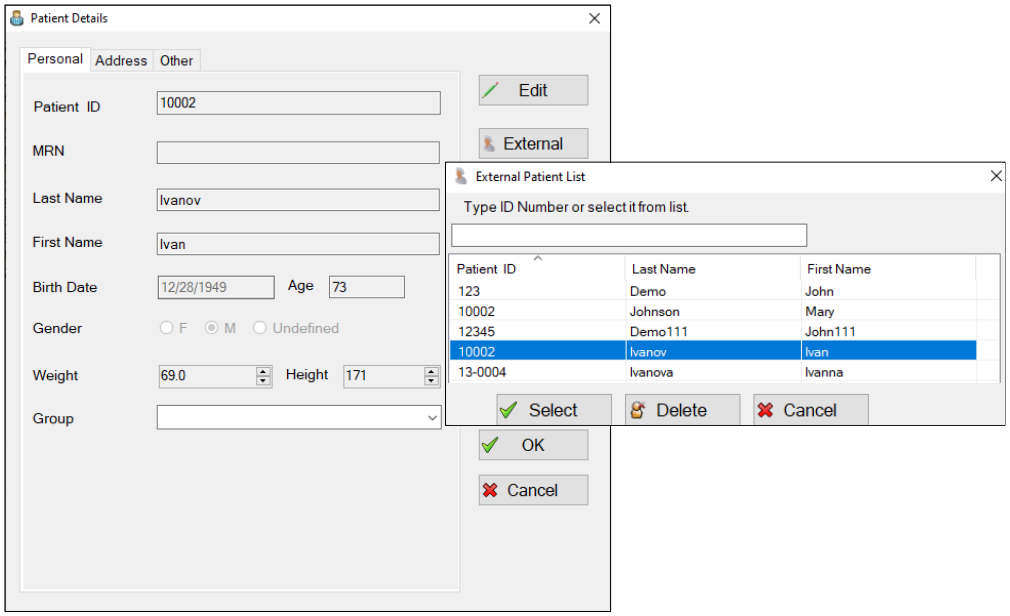


Figure 152: Patient Details Dialog Box

2. Under the **Personal** tab, click Edit and edit the details.

   Or

   Click External, select a patient from the External Patient List Dialog Box, and then click Select on the External Patient List Dialog Box.

Click OK on the **Patient Details** Dialog Box.

To edit the patient address, click the Address tab.

The **Address** Dialog Box is displayed.

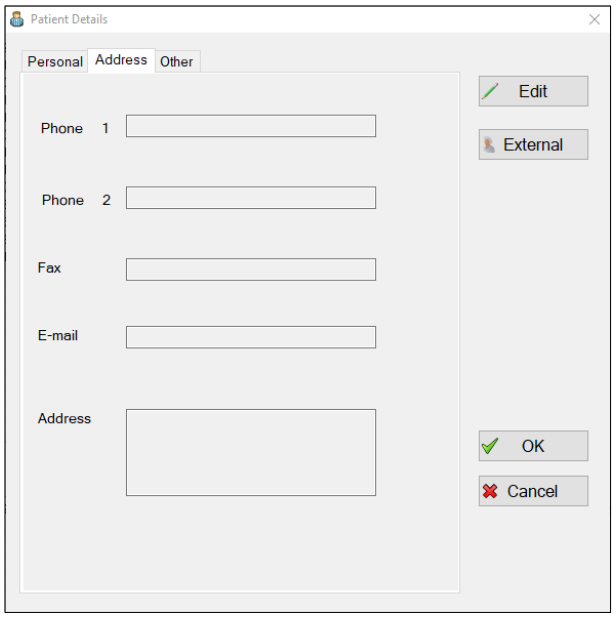


Figure 153: Address Dialog Box

Under the **Address** tab, click Edit and edit the details.

Click OK on the **Address** Dialog Box.

To edit the patient **Medications**, **Indications**, and **Other**, click the Other tab.

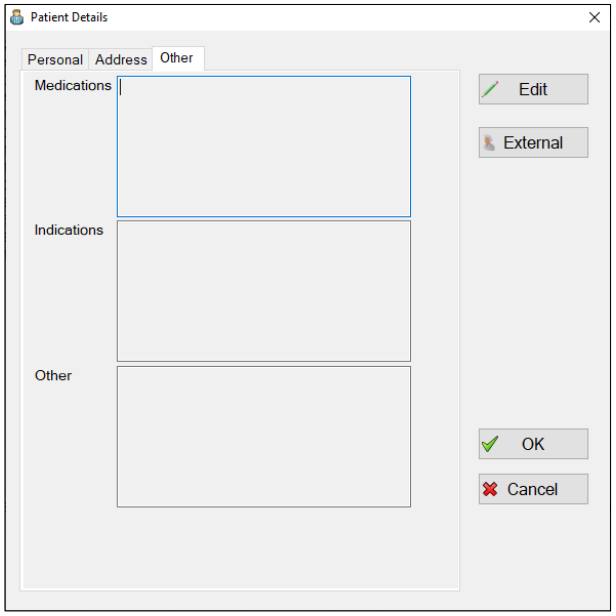


Figure 154: Other Dialog Box

Under the **Other** tab, click Edit and edit the details.

Click OK on the **Other** Dialog Box.

Adding New Patient

1. To add a new patient, click New.

   The **Personal** Dialog Box is displayed.

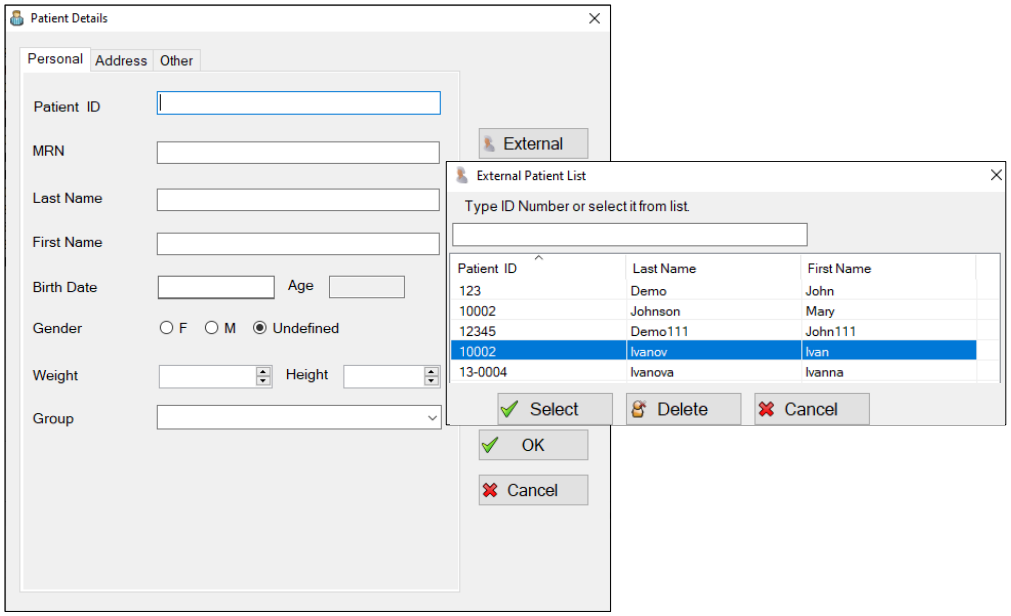


Figure 155: Personal Dialog Box

2. Add the new patient's details: Patient ID, MRN, Last Name, First Name, Birth Date, Gender, Weight, and Height.

3. To look for an existing patient, open the **Patients Screen**, fill in the **Patient ID**, and then click . Search

   The patient is displayed on the patient list, after selecting the patient please click Select.

   Or

   Click External, select a patient from the External Patient List Dialog Box, and then click Select on the External Patient List Dialog Box.

4. Click OK on the **Personal** Dialog Box.

5. To add the new patient address, click the Address tab.

The **Address** Dialog Box is displayed.

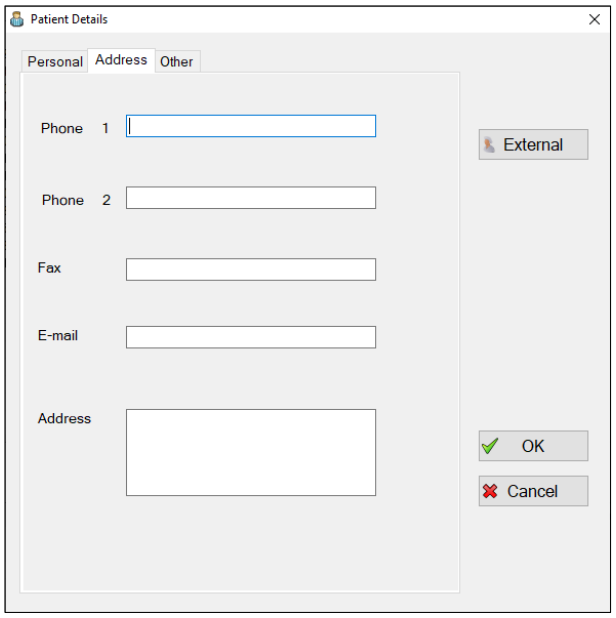


Figure 156: Address Dialog Box

6. Fill all details.
7. Click OK on the **Address** Dialog Box.

To edit the patient **Medications**, **Indications**, and **Other**, click the Other tab.

The **Other** Dialog Box is displayed.

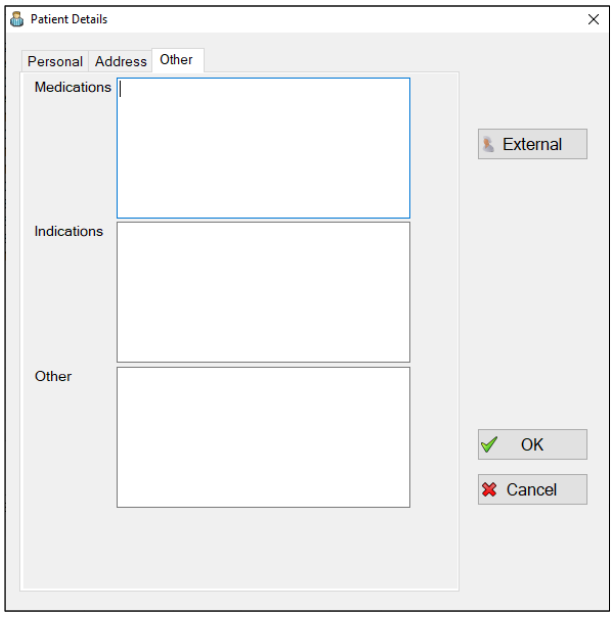


Figure 157: Other Dialog Box

Fill all details.

Click OK on the **Other** Dialog Box.

Deleting Patient

1. To delete a patient along with all attached tests (administrator only), select (highlight) the patient, and click Delete.

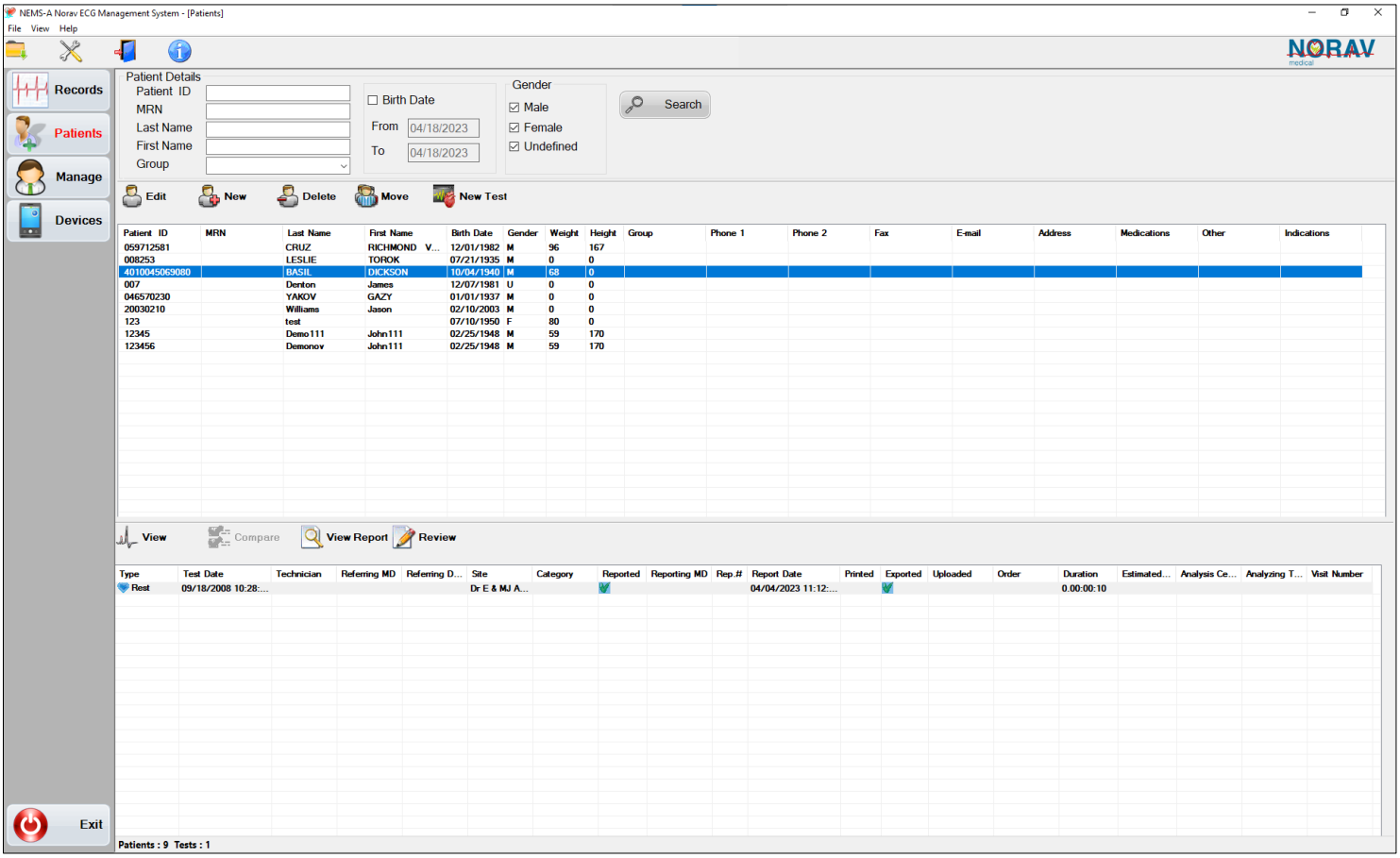
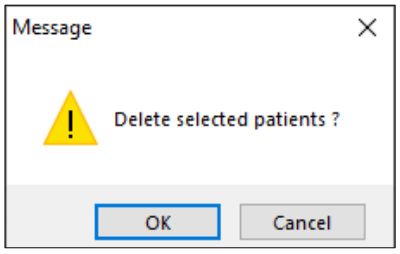


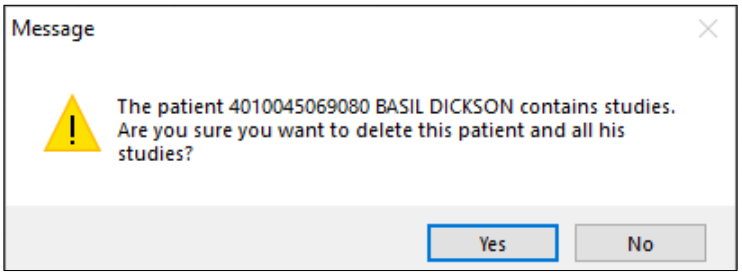
Figure 158: Deleting Patient from Patients Screen

The following message is displayed:



Click OK

The following message is displayed:



Click Yes

The selected patient with all attached tests is deleted.

Moving Patient from One Group to Another

1. To move a patient to another group, select (highlight) the patient, and click 

.

   The **Groups Window** is displayed on the screen under the 

button.

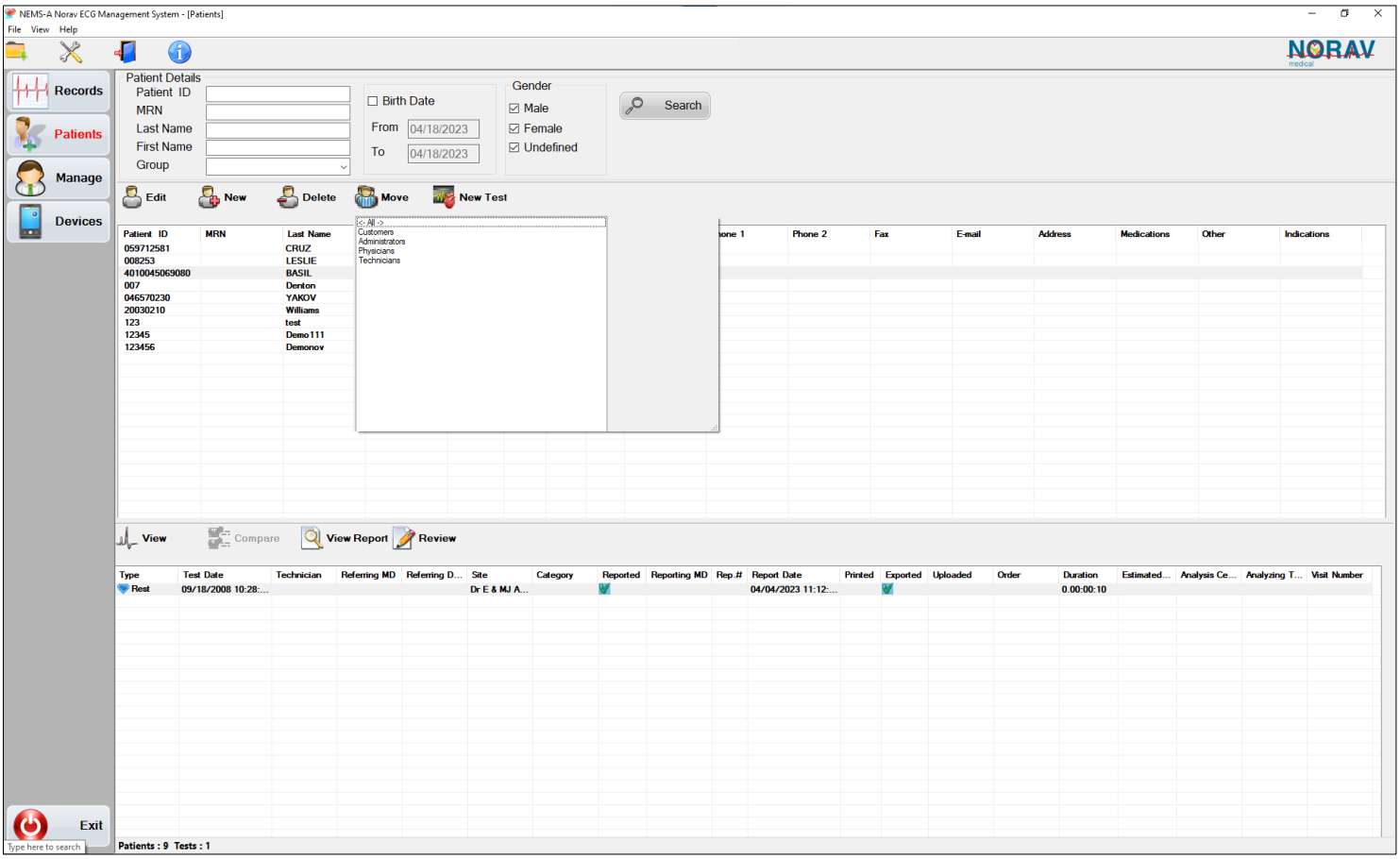


Figure 159: Moving Patient to another Group Screen

Click (select) a group from the **Groups Window**.

The selected patient is moved to the selected group.

Creating New Test

1. To create a new test, select (highlight) the patient and click 

.

   The **Test Type List Window** is displayed under the 

button.

   For test type descriptions, see the table below.

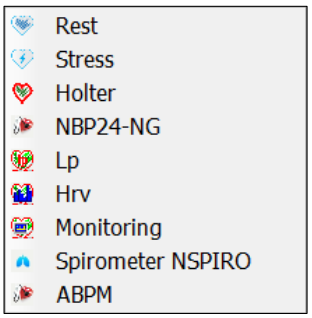


Figure 160: Test Type List Window

Test Type Descriptions

Test Type	Description
Rest	ECG test through repeated cardiac cycles during rest (10 seconds minimum) at clinic.
Stress	ECG test through repeated cardiac cycles during exercise at clinic.
Holter	ECG test using a portable recorder for 24 hours to two weeks at home. Available options: NR Patch (NR-314-P device) or NR (all other NR-series Holter devices, excluding NR-314-P).
NBP-24 NG	24-hour Ambulatory Blood Pressure Monitoring using the NBP-24 NG recorder.
LP	Signal-averaged electrocardiogram (SAECG) testing performed to identify low-amplitude late-potentials, typically at the end of the QRS complex, aiding in identification of increased risk for ventricular tachycardia.
HRV	Heart Rate Variability (time intervals between heartbeats) testing.
Monitoring	ECG Monitoring test during activity (ergometer, treadmill, etc.).
Spirometer NSpiro™	Pulmonary Analysis.
ABPM	24-hour Ambulatory Blood Pressure Monitoring using the NBP One or Oscar 2 recorder directly via NEMS-Q, NEMS-A, or NEMS Web.

2. Select the required test type from the list.
   The corresponding test application is opened.

Viewing Patient Test

To view a patient's test (report), select (highlight) the required test on the bottom pane and click 

on the bottom pane.
The corresponding test application is opened, allowing viewing the test.

Comparing Patient Tests

To compare two or more patient **Rest** tests, select (highlight) the tests, and then click 

.

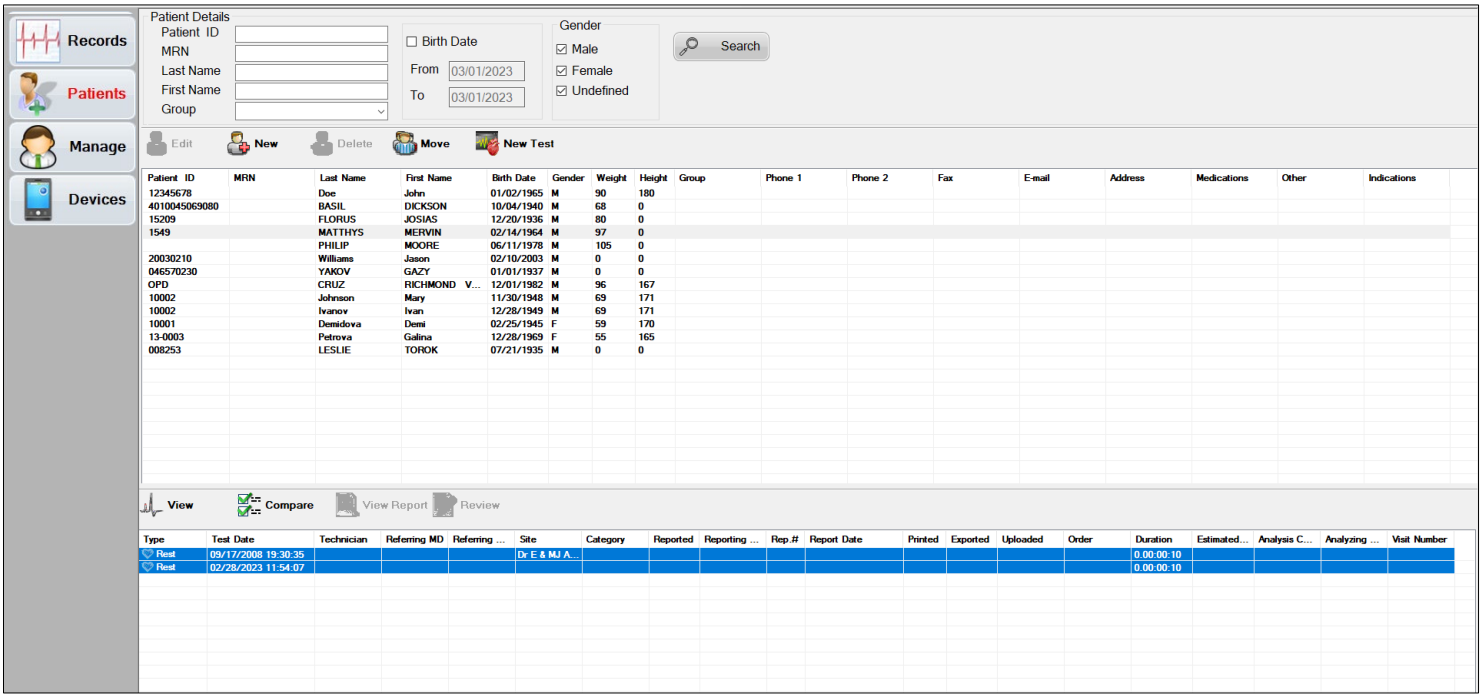


Figure 161: Selecting Tests for Comparison Screen

The Resting ECG application is opened, displaying the compared tests.

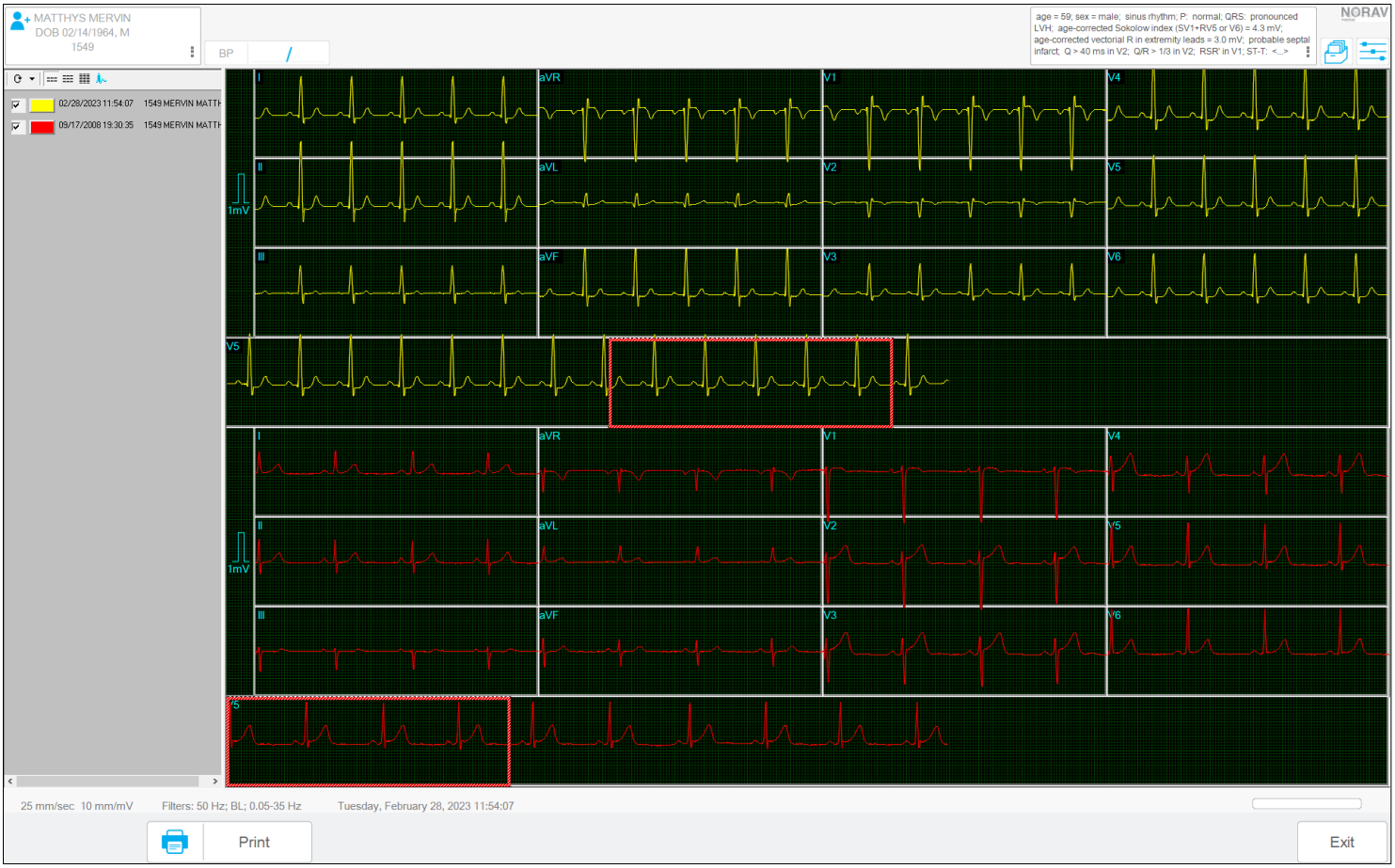


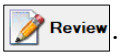
Figure 162: Comparing Tests Screen

Viewing Report

To view patient test report, select (highlight) the test, and then click 

.
The report of the selected test is displayed.

Reviewing Test

To review patient test report (physician only), select (highlight) the test, and then click 

.
The corresponding application is opened, displaying the test for physician review, and allowing adding remarks.

Manage Tab

The Manage tab enables the creation of user groups, as well as referring physicians, technicians, and reporting MDs lists.

Figure 163: Manage Screen

Patient groups can be created in the **Manage** tab. After creating a **Group**, you can add patients to it and search for them in the **Records** tab using this filter. You need to create relevant groups first to use them for filtering records. There is only one predefined default patient group named **All**, which includes all patients within the system. For more detailed information about groups

1. To add a group, click 

and then click 

.

   The **Add** Dialog Box is displayed.

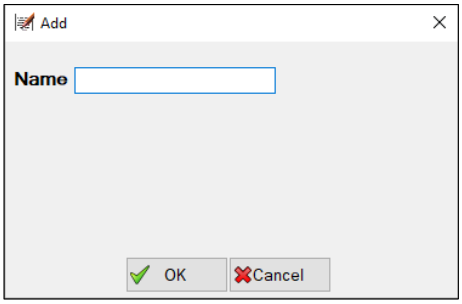


Figure 164: Add Dialog Box

Fill the group name, and then click 

.

The group is added to the **Groups** list.

To edit a group, select (highlight) the group and click 

.

The **Edit** Dialog Box is displayed.

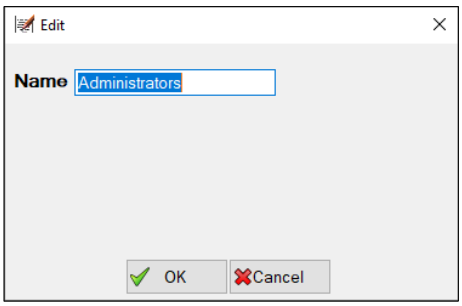


Figure 165: Edit Dialog Box

Edit the group name and then click OK.

To delete a group, click Delete.

The **Delete** Dialog Box is displayed.

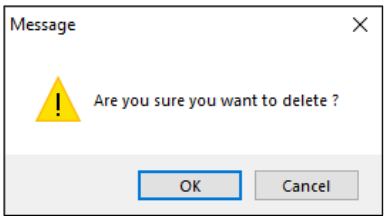


Figure 166: Delete Dialog Box

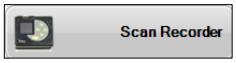
Click OK

All other types of groups work the same way.

Devices Tab

The Devices tab allows scanning connected Holter Recorder and downloading patient test to NEMS-A.

Figure 167: Devices Screen

1. Connect the recorder and click the  button.

   The **Patient Details Screen** is displayed.

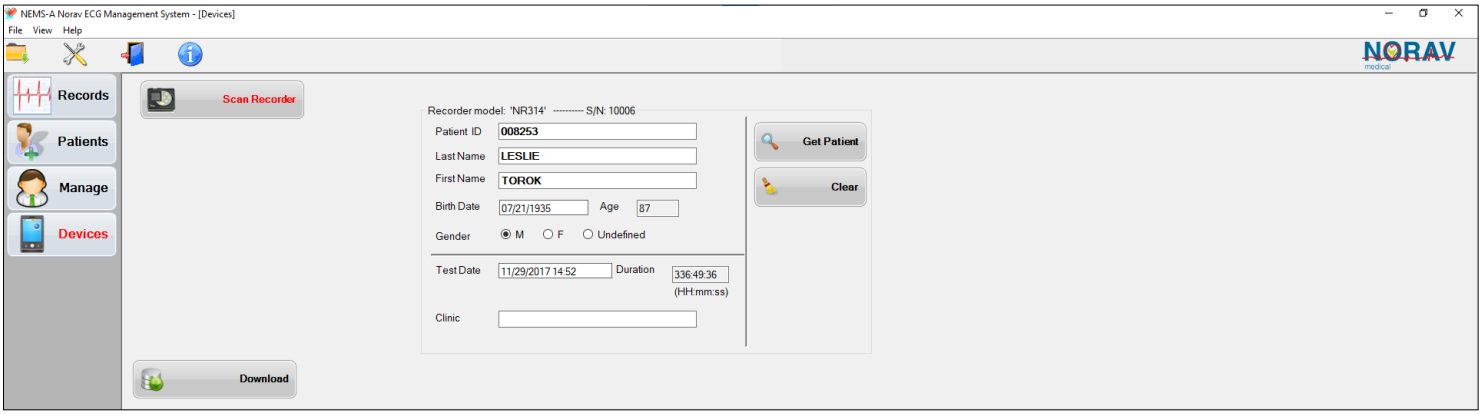
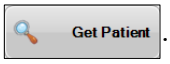


Figure 168: Patient Details Screen

2. To download the test (record) to NEMS-A, click  .

3. To replace the patient details if the patient already exists in the DB, type the first digit of the patient's ID and click  .

   The **Patient List Window** is displayed.

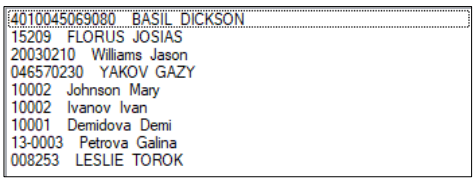
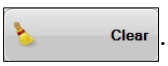


Figure 169: Patient List Window

4. Select the patient from the list.
   The selected patient's details are displayed on the **Patient Details** screen.

5. To **clear** the patient's details, click  .

Working with the NH-301 Holter Analysis System

The following operations are specific for operating NEMS-A together with the NH-301 app:

Preparing Holter Recorder for New Patient

Downloading ECG Recording from Holter Recorder

Reviewing ECG Record using NH-301 Software

Preparing Holter Recorder for New Patient

Preparing a Holter recorder involves sending patient data to the recorder before starting the test. The NEMS-A application supports two preparation flows:

- **Via USB connection** – used when the recorder is physically connected to the PC or when its memory card is inserted via a card reader.
- **Via Bluetooth connection** – used when the recorder is paired with the PC via Bluetooth. This method enables the **Check ECG** function, which allows users to verify the quality of the ECG signal and the electrode connections in real time before sending data to the recorder. For more details on connecting recorders to the PC, refer to the **Pairing Norav Devices via Bluetooth** section of the **NH-301 Instructions for Use**.

Both methods follow similar steps for selecting a patient and assigning test details, but the Bluetooth-based flow includes optional signal verification using the **Check ECG** button.

To prepare the recorder using a USB connection:

1. Select a patient in the **Patients Screen**, and then click **New Test**.

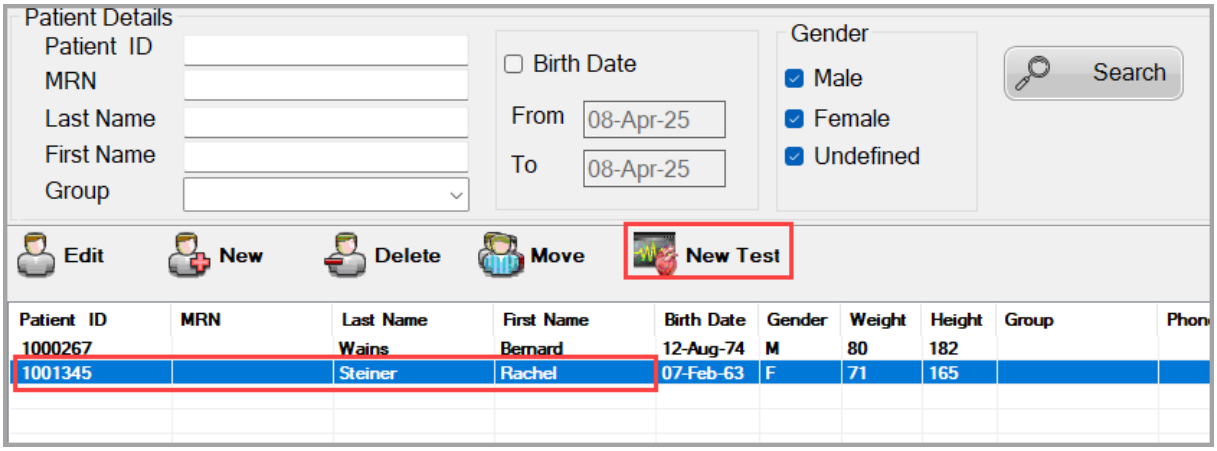


Figure 170: Start New Test

2. In the **New Test** drop-down menu, hover over **Holter**, and then select either:

   - **NR** to prepare any of the NR recorder models **except** NR-314-P;

- **NR Patch** to prepare **specifically the NR-314-P** recorder model.

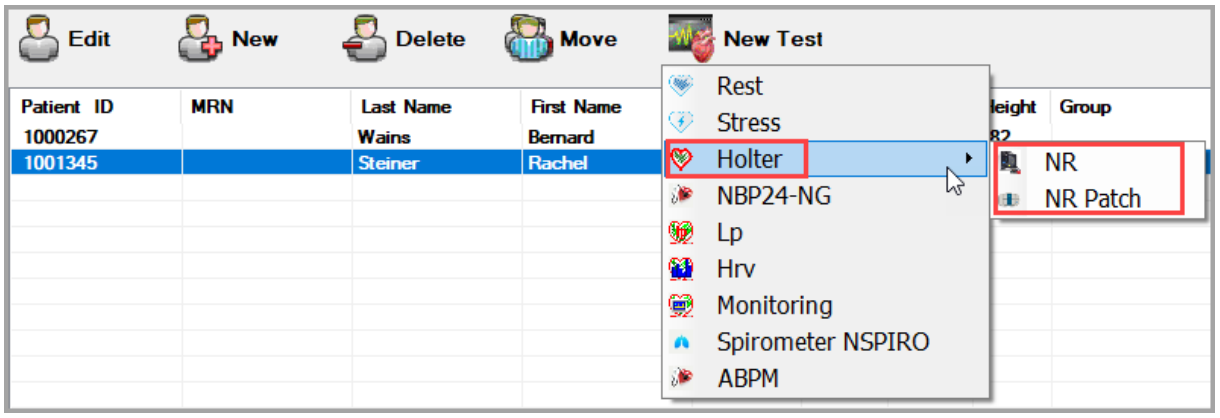


Figure 171: Select Recorder Type

3. The **Patient Details** window is displayed. Verify and complete patient demographics, including **Patient ID**, **First Name**, **Last Name**, **Birth Date**, and **Order**, if available (see **Figure 172: Patient Details Window**).

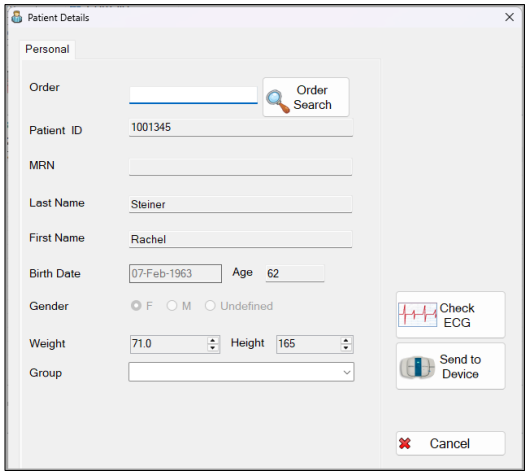


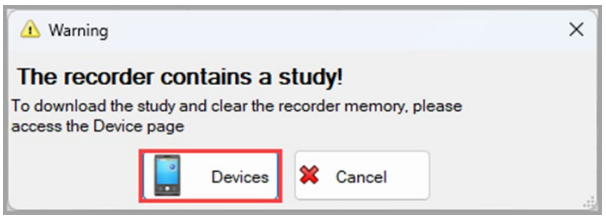
Figure 172: Patient Details Window

Note

It is important to complete patient demographics (**Patient ID**, **First Name**, **Last Name**, **Birth Date**, and **Order**, if available).

Note

If the recorder memory contains a test record, a warning message will appear (see below). Click **Devices**, switch to the **Devices** tab, and download the existing record. For more details, refer to **Downloading ECG Recording from Holter Recorder**.



4. Once the patient's demographics are complete and verified, click **Send to Device** in the NEMS-A app.

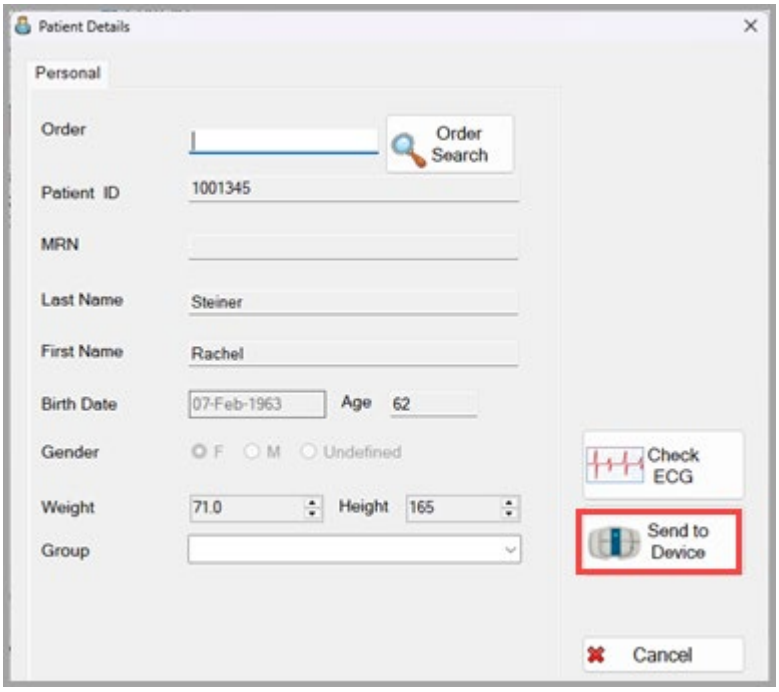


Figure 173: Send to Device

5. Wait until the recorder preparation is completed. A status message will be displayed. Click **OK** to dismiss the message. Now you may disconnect the **Holter recorder** or the **memory card** from the PC.

Figure 174: Status Message - NEMS-A

6. Hook up the patient. Once everything is ready and the electrodes are properly connected, you may proceed with the test.

To prepare the recorder using a Bluetooth connection:

1. Connect the recorder via Bluetooth and follow **Steps 1-3** of the instruction above on how to prepare the recorder using a USB connection.
2. **(Optional) For a Bluetooth connection:** When the patient is hooked up, you may click the **Check ECG** button to verify electrode connection and signal quality:

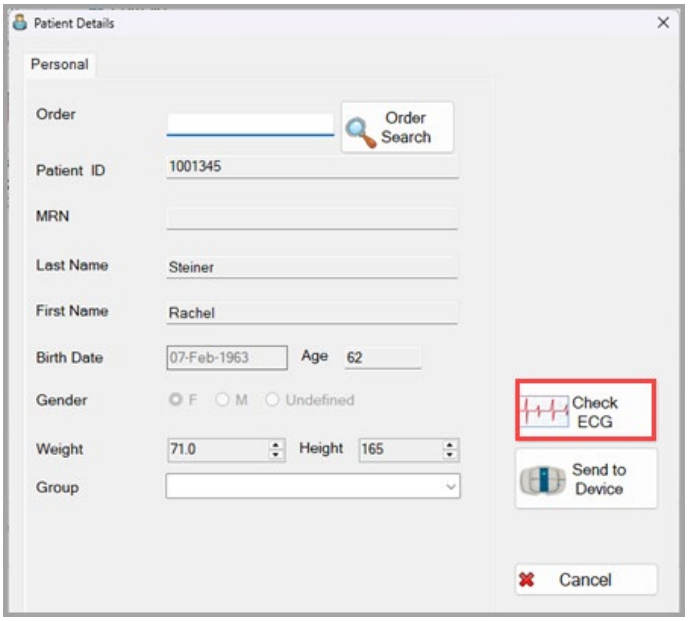


Figure 175: Check ECG – NEMS-A

1. Click **Check ECG**. The **Norav Holter Device Manager** application will be launched. Wait until the recorder selection screen is displayed.

Figure 176: Norav Holter Device Manager Launcher

2. Select the Bluetooth-connected recorder from the list. If the recorder does not appear, click **Refresh** in the bottom-left corner and recheck. If it still does not appear, verify your Bluetooth connection.

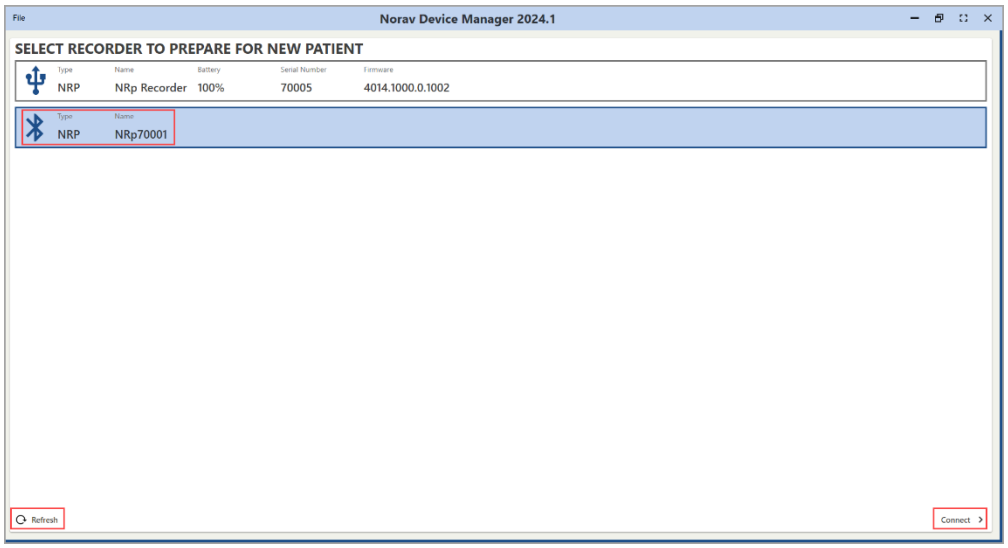


Figure 177: Select Recorder

3. Click **Connect** in the bottom-right corner. The **Record Information** screen will appear, containing the **Personal Information** of the patient and **Record Information**.

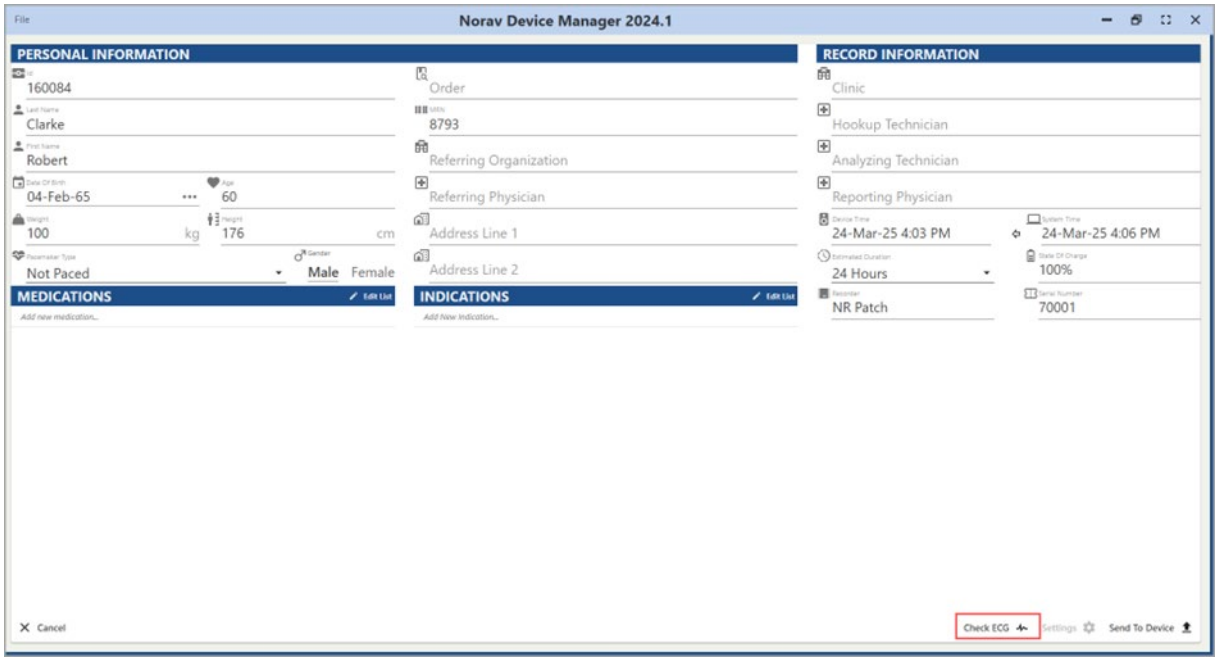


Figure 178: Click Check ECG

4. Click **Check ECG** again in the bottom-right corner. A pop-up window will stream the ECG signal and indicate the electrode connection status. If any electrode is marked **OFF** and the signal is absent or distorted, adjust the connection and retry.

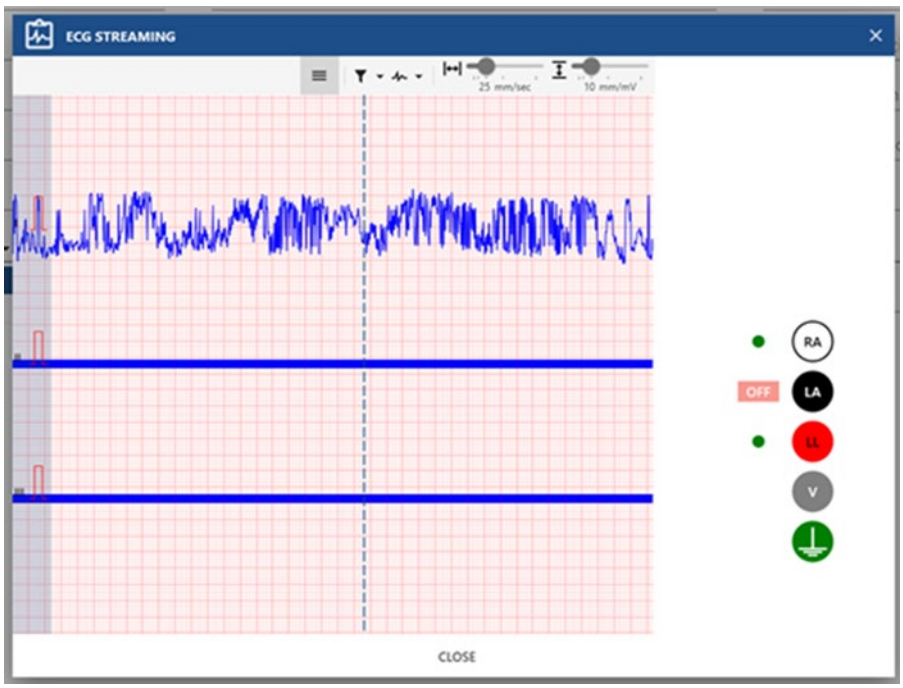


Figure 179: ECG Streaming

4. Once electrode connections are verified and rectified if needed, click **Send To Device** in the Device Manager app.

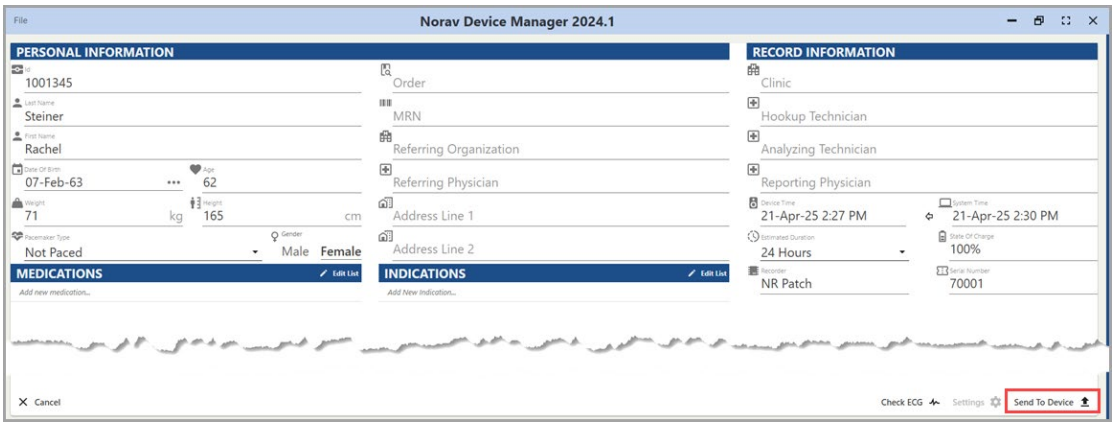


Figure 180: Send to Device – Device Manager

5. Wait until the recorder preparation is completed. A status message will be displayed. Click **OK** to dismiss the message.

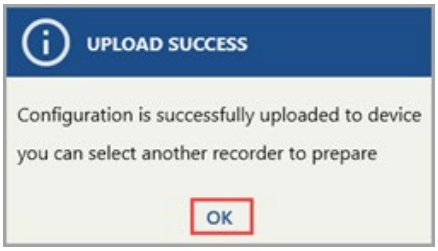


Figure 181: Status Message – Device Manager

6. Once everything is ready and the electrodes are properly connected, you may proceed with the test.

Downloading ECG Recording from Holter Recorder

1. After the test is completed, make sure the Holter recorder is connected to the PC, or the Holter Memory Card is connected to the PC via the Card Reader device.
2. Click the Devices tab, and then click the Scan Recorder button.
   The Patient Details Screen is displayed.

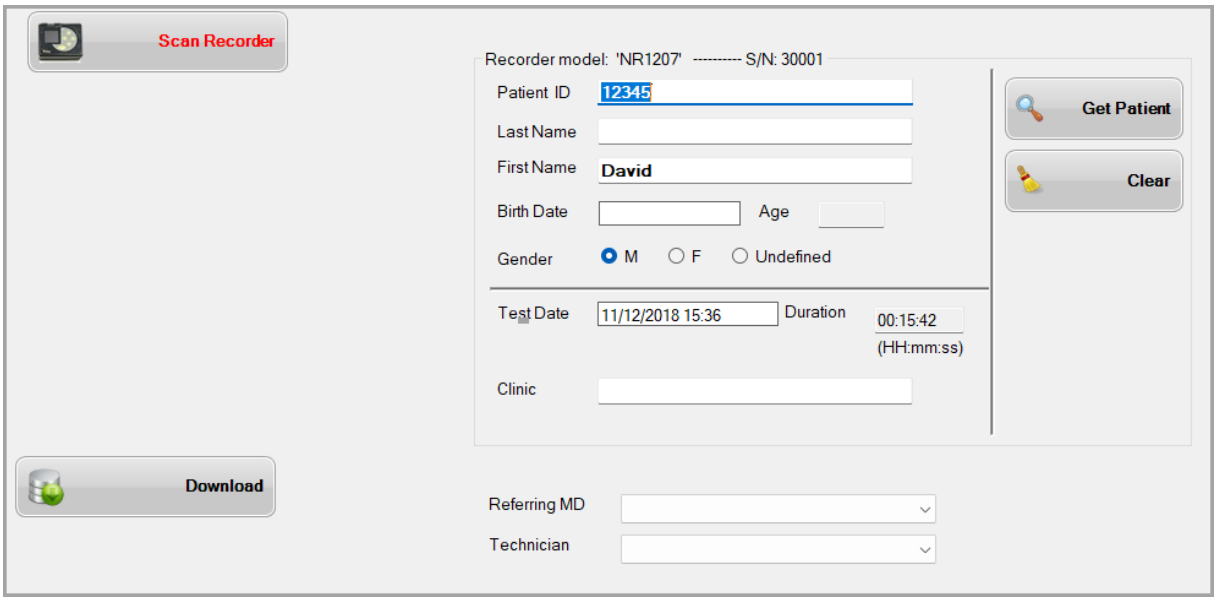
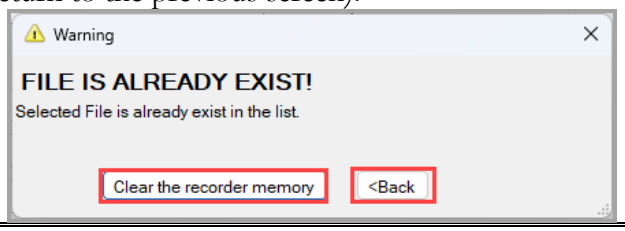


Figure 182: Patient Details Screen

3. Validate or edit the patient details, and then click the Download button.

Note

If a record already exists in the system, a warning message (see the image below) will appear with two options: **Clear the recorder memory** (to remove the record) or **<Back** (to return to the previous screen).



4. You will be prompted with the **Download Complete** dialog box, indicating that the test was successfully downloaded to the NEMS-A system.

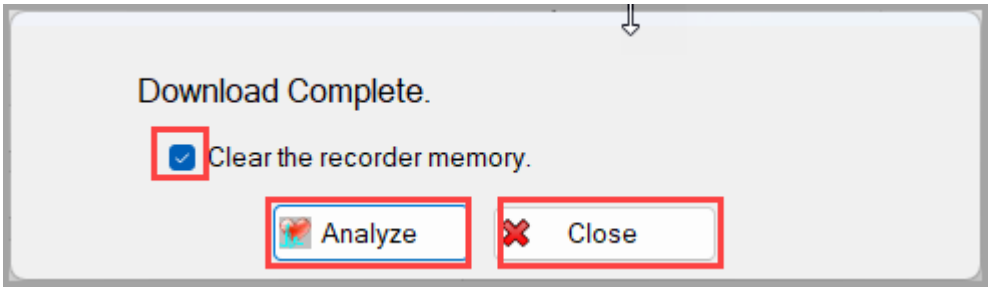


Figure 183: Download Complete Dialog Box

5. **(Optional)** To remove the downloaded record from the recorder, leave the **Clear recorder memory** option checked. To keep the record in the recorder memory, uncheck the **Clear recorder memory** option.

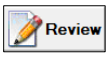
6. Click **Close** to proceed without analyzing the downloaded record, or **Analyze** to analyze the record immediately. Depending on whether the **Clear recorder memory** option is checked, the record will either be removed from the recorder memory or kept intact..
7. Disconnect the **Holter Recorder** or the **Memory Card** from the PC.

Reviewing ECG Record using NH-301 Software

Note

The NH-301 Holter software license is required.

To open a Holter recording, click the 

tab, select a Holter test, and then click the 

button on the record list toolbar.

For detailed description, refer to the NH-301 IFU – Reviewing and Editing ECG Recording.

Working with the PC-ECG 1200 System

The PC-ECG 1200 software is required with the PC-ECG 1200 software license.

The following operations are specific for operating NEMS-A with the PC-ECG 1200 system.

Starting New ECG Test

Opening ECG Record for Review

Starting New ECG Test

1. To start a new test from the **Patients Screen**, select (highlight) the patient, click the New Test button, and then select the test type from the drop-down list.

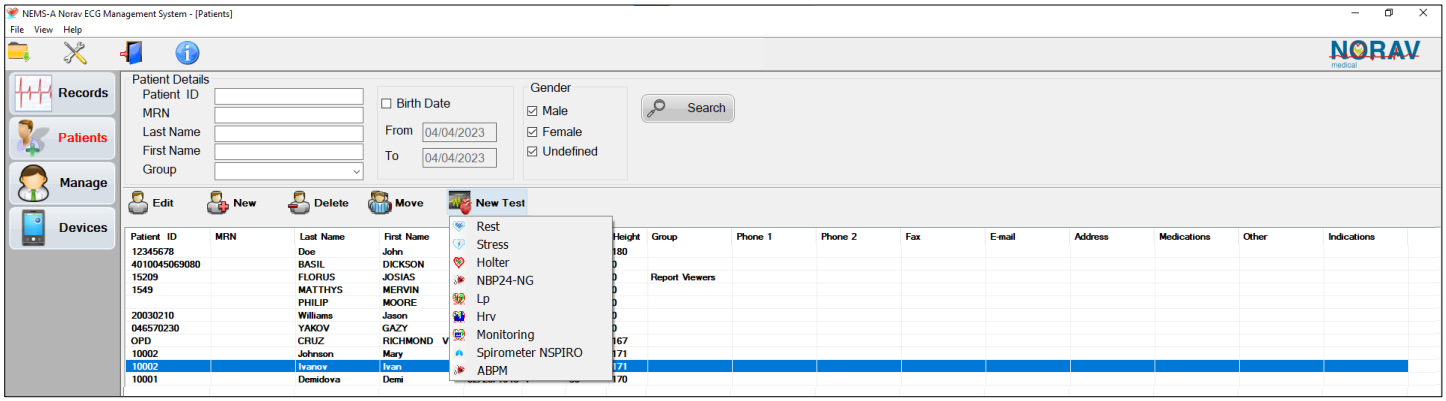
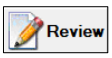


Figure 184: Starting New Test from Patients Screen

After the ECG recording is finished, click Exit to close the PC-ECG 1200 application.

The ECG recording is automatically imported from the database and displayed on the patient's recording list.

Opening ECG Record for Review

1. Select an ECG test (only by physician) from the recording list and then click the 

button.

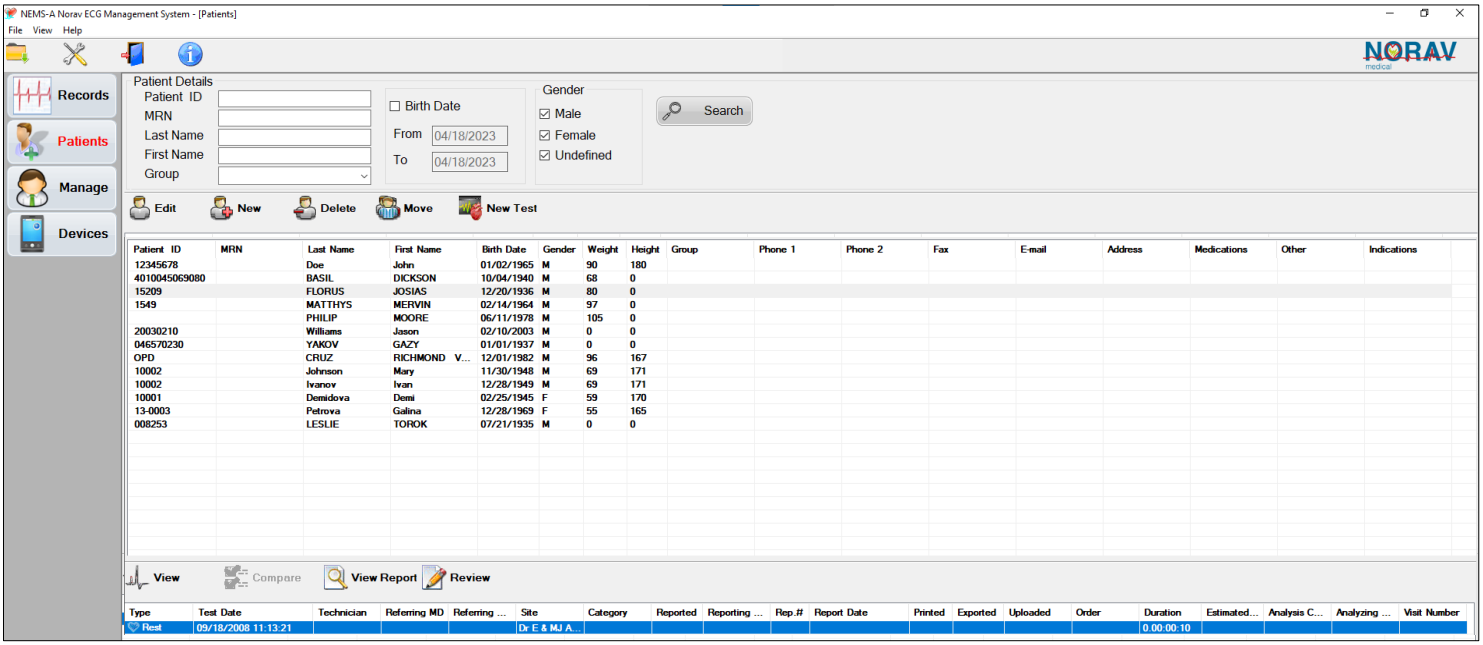


Figure 185: Opening ECG Recording for Review

The ECG recording is opened in the PC-ECG 1200 program interface.

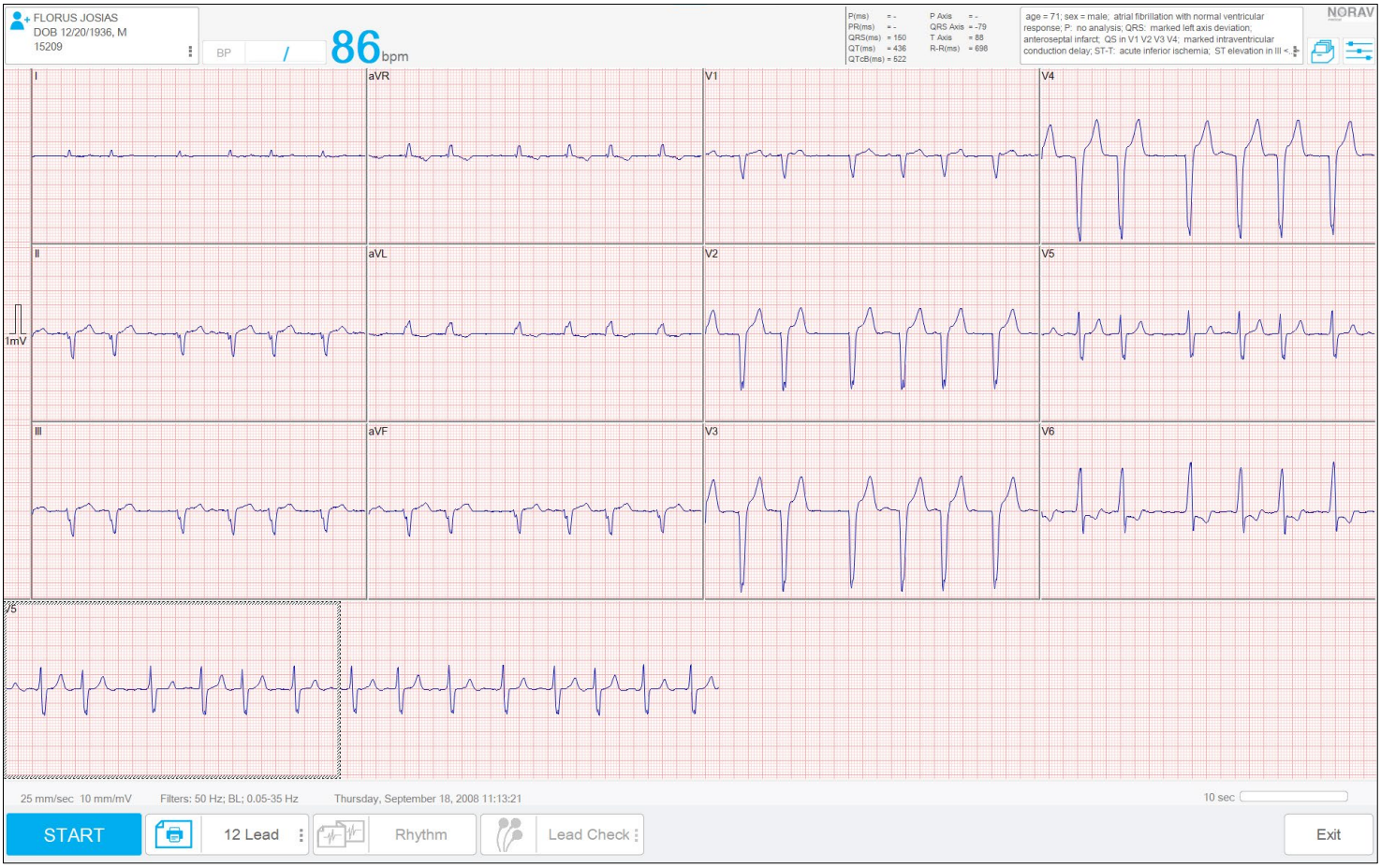


Figure 186: ECG Recording Opened for Review

Click on the Interpretation window (with automatic Interpretation and Remarks) on the top right of the screen (highlighted blue).

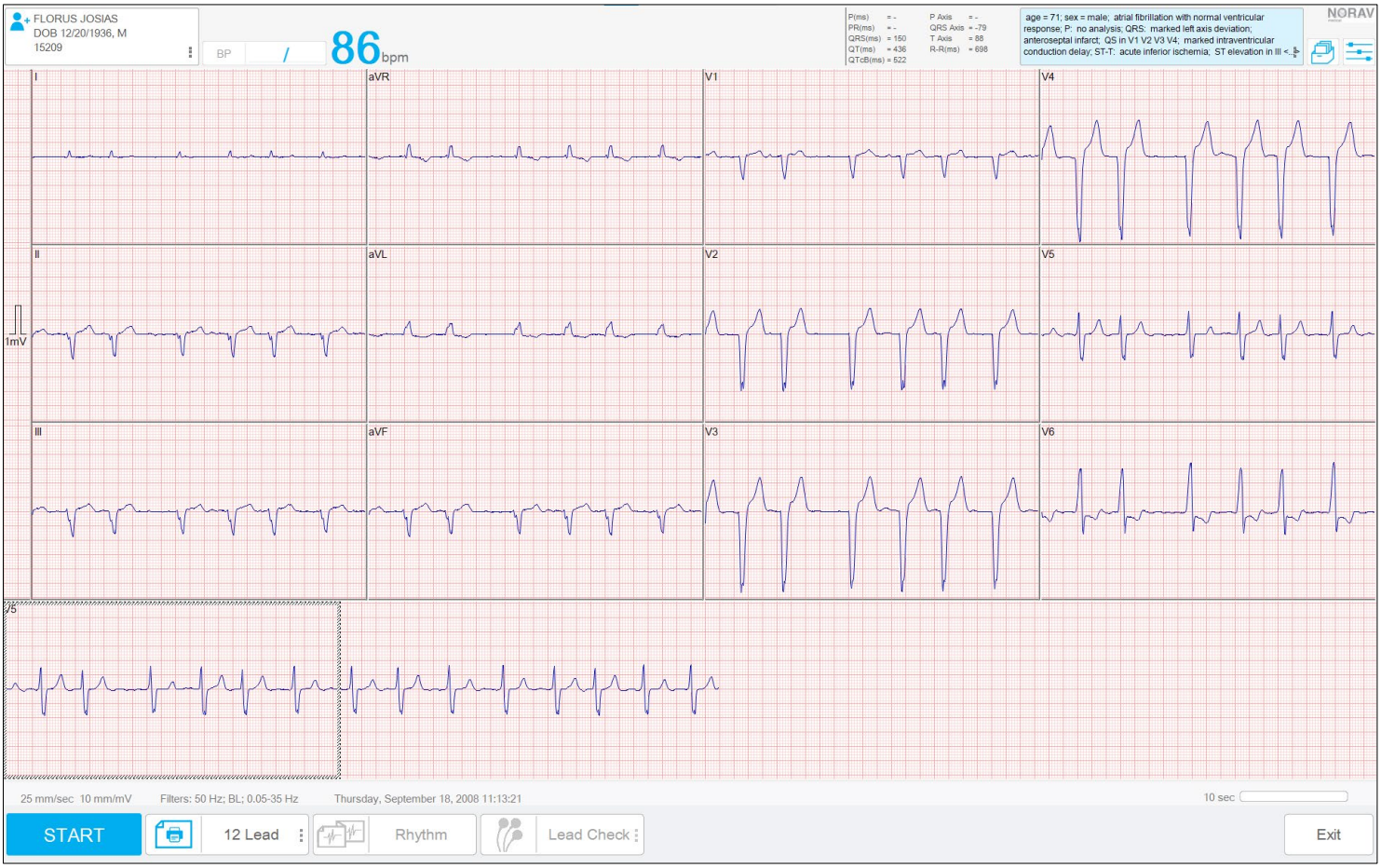


Figure 187: Adding Remarks to ECG Recording

The **Remarks** Dialog Box is displayed.

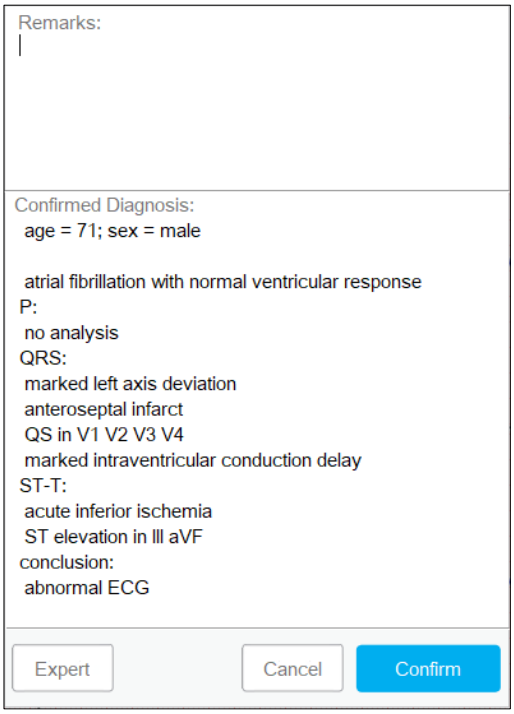


Figure 188: Remarks Dialog Box

Write remark(s) and click 

The written remark(s) are added.

Or

To add remark template(s), click Expert.

The **Expert Interpretation** Dialog Box is displayed.

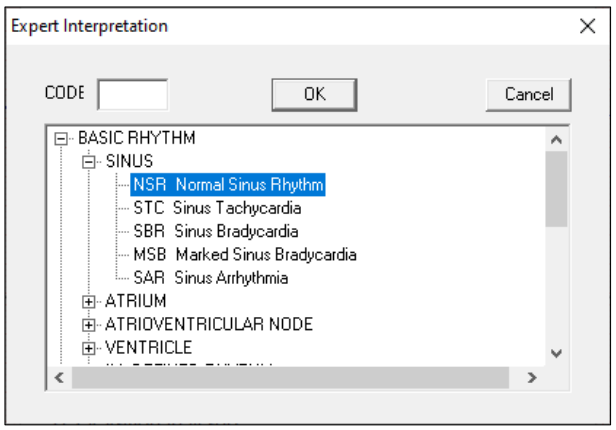


Figure 189: Expert Interpretation Box

Select the appropriate remark template(s) from the ⊞ folder(s) and click OK

The selected remark template(s) is displayed on the **Remarks** Dialog Box.

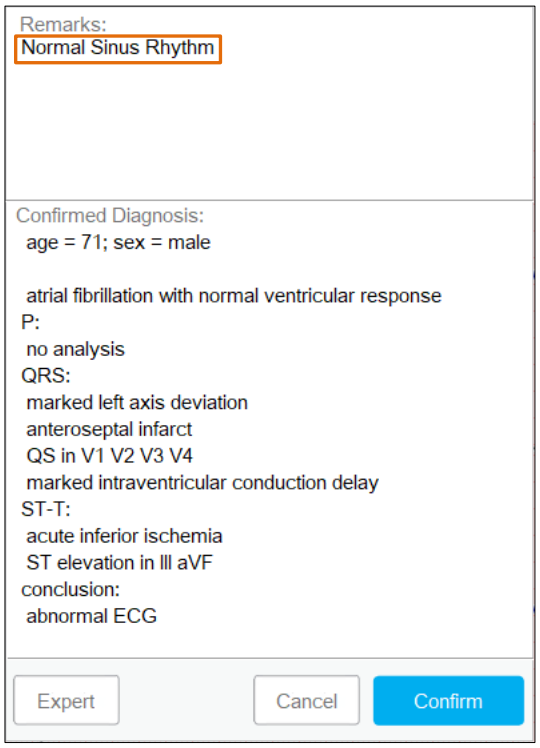


Figure 190: Remarks Dialog Box with Added Remark

To save the added remark template(s), click Confirm

Downloading ECG+ Recordings from NR-1207-3

1. Connect the NR-1207-3 recorder, which contains the data acquired in the ECG+ mode, to the PC using a USB cable or insert the NR-1207-3 recorder Memory Card into the card reader.

Click the Devices tab and then click the Scan Recorder button.

The list of ECG records in the NR-1207-3 recorder Memory Card is displayed.

Validate or edit the records one-by-one on the download list. The edited data is displayed in red.

To apply the changes after editing the patient data, click the button.

To select the records for download, mark the checkbox(es), and then click the Download Selected button.

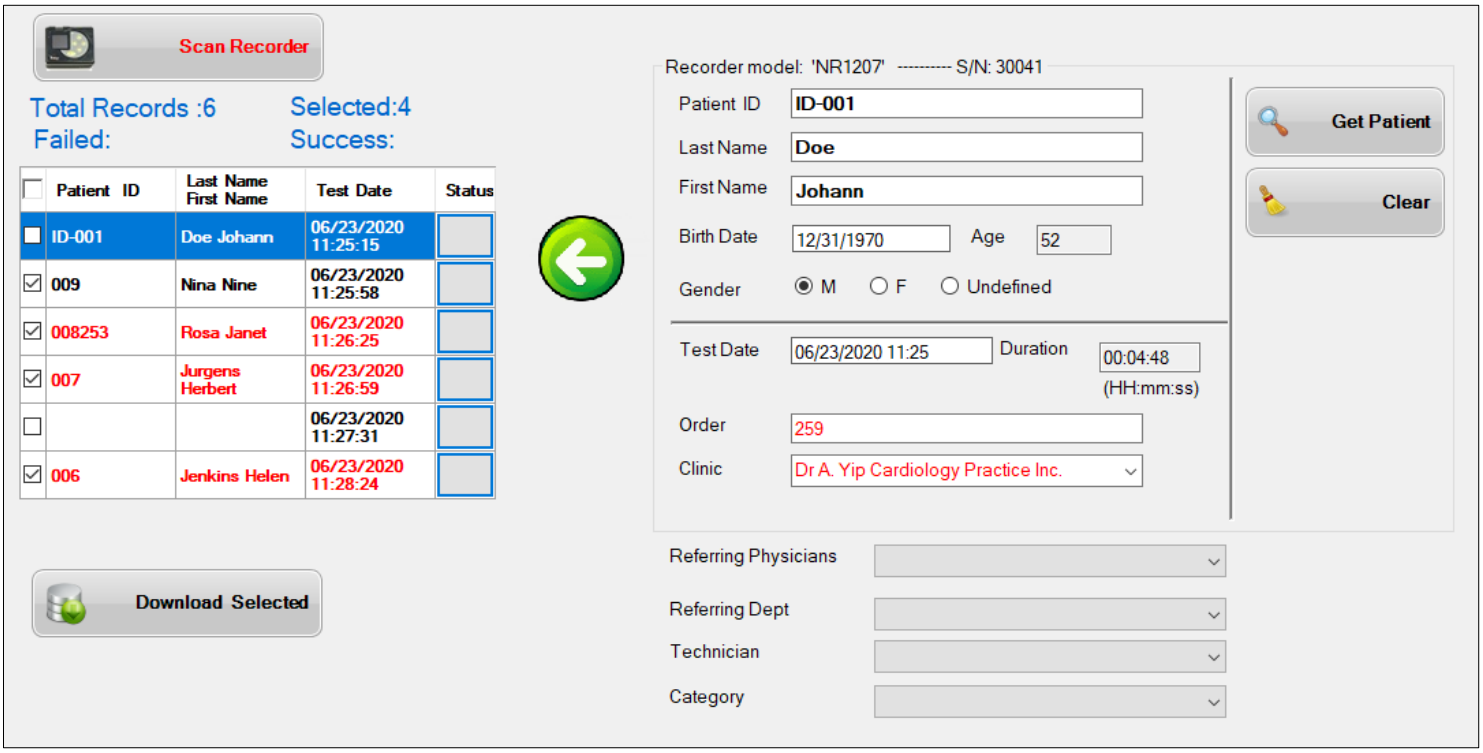


Figure 191: Selecting Records for Download

Wait until the procedure ends.

The successfully downloaded records are marked on the **Status** column,

and any unsuccessful downloaded records are indicated .

Disconnect the NR-1207-3 recorder or the Memory Card from the PC.

Click the Records tab and validate that all new Resting ECG records appear on the list.

ABPM Module

Operating Environment

Windows 10 Pro 32/64 bit or Windows 11 Pro

4 GB RAM

Core i5 CPU

.Net Framework 4.7.2

SQL Server Express 2019

USB port

Product Functions

1. Connect to ABPM device (Oscar 2, NBP One) via USB.

Select/Create Patient

Select Patient -> New Test -> Select ABPM test.

Later – Select NBP-24 NG test.

Prepare recorder for ABPM test (see Section Preparing NBP One Recorder for New ABPM Test).

Download the ABPM recording from the recorder (see Section Downloading ABPM Recording from NBP One Recorder).

Preview the ABPM results in Record List (see Section Previewing Test Results).

Review the ABPM examination results (see Section Reviewing ABPM Recording in NEMS-A).

Report types (see Section Report Types):

Ambulatory Blood Pressure Report

Patient Information

BP Profile

Bar Chart

Measurements

Diastolic vs Systolic Graph

Pie Chart

Summary Report

Setup

ABPM-related parameters

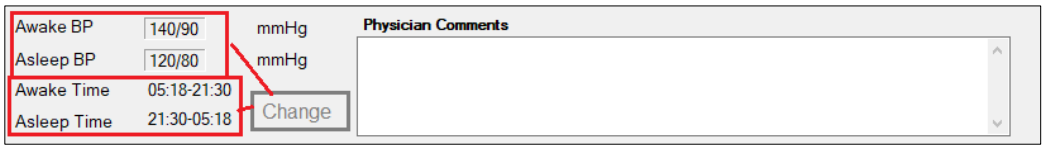
Measurement Schedule

Specifies when and how often the monitor takes readings.

For Awake Time and Asleep Time, select from the Hour drop-down menu to establish the start time for these periods.

From the Brachial BP Interval drop-down menus, select the desired interval between readings (5, 10, 15, 20, 30, 45, 60, 90, or 120 minutes.

When downloading a test from the BP device, you can change the Awake Time, Asleep Time, or change the values (see following Figure).

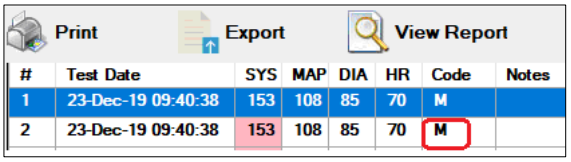


Start study in 5 minutes option: the study starts automatically after programming.

The physician is allowed to change day and night intervals (Prepare, Download, Edit).

The measurements table out of limits is in red based on limit settings (see following Figure).

Manual Measurement events are displayed in the Events field (see following Figure).



Advanced Options:

Max. Pressure – Establishes the maximum inflation pressure for the monitor (160 mmHg to 280 mmHg).
Suggested setting is 30 mmHg above the highest expected systolic BP.

Display Results – When ON, allows viewing the results immediately after a measurement.

Manual Readings - When ON, allows the taking measurements outside the scheduled program using the Start/Stop button.

Day/Night button – When ON, enables the Day/Night button on the monitor allowing the patient to start the Awake and Asleep periods according to their daily schedule.
A period can be started up to four hours before the programmed period begins.

Audible Alerts – Play an alert sound at the beginning and upon completion of each reading, during the Awake period only.

Retry Attempts – The monitor reattempts a measurement that initially failed.

Automatically open a patient file directly after the data is retrieved.

Viewing an Ambulatory Blood Pressure study:

ABP Data – ABP measurement data from the monitor and relevant graphs.

Patient Info – Demographic info: patient name, DOB, sex, patient ID, contact information, physical description, medications, indications.

Clinic Info – Clinical information (site).

Statistics – Statistical analysis of the ABP study.

Summary –Interpretative summary settings and results for current study.

Events Diary, containing managed list with Date and Time.

Note

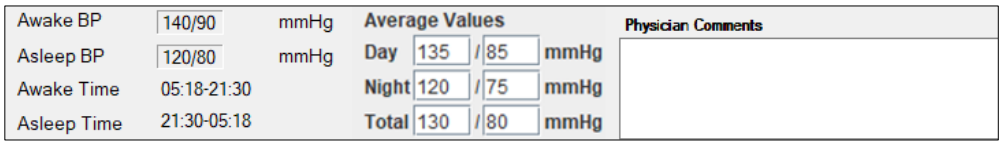
After changing, the raw data is saved.

Blood Pressure Limits for existing patients & global system limits (see following Figure).

The source of average values is the SQL tables (children and adults) hypertension limits.

The values can be changed by the user and have a button for Standard (which restores the values from SQL).

The average values are included in the review pane (Total = Round (Day+Night)/2).



Various Export File types: CSV, PDF, NBP (Norav Blood Pressure)

The ABPM module allows comparing current patient record(s) with multiple history records.

Ordering the ABPM devices:

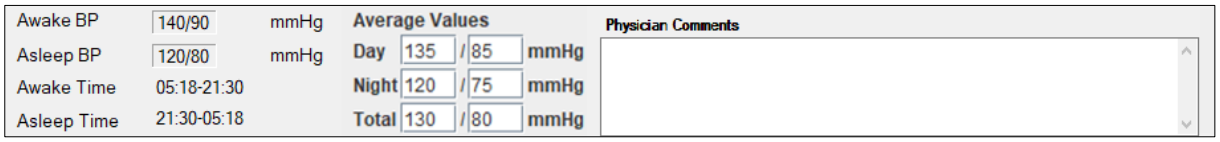
NBP-24 NG

NBP One

Oscar 2

ABPM Settings Screen

See following Figure.



You can specify global thresholds for Systolic and Diastolic blood pressure.

When these values are exceeded, the measurements are marked accordingly in the analysis.

These values are automatically stored as limits for new patients.

Recent studies (Blood Pressure percentiles by Age and Height) have shown that the limit depends on age and gender in children and adolescents. The European Society for Hypertension (ESH) published comprehensive tables, which constitute the basis of the thresholds set for the Norav ABPM.

The thresholds are determined based on 95% percentile curve. The limit value can then be defined as one which is either equal or lower for 95% of a whole study (statistic report on children). Any values above this limit are defined as hypertension.

Working with the percentile curve: To display the percentile curve (P95) (only for children and adolescents from 4 to 18 years of age), the patient's date of birth must be entered; then this data will be the basis for the calculation of the patient's age.

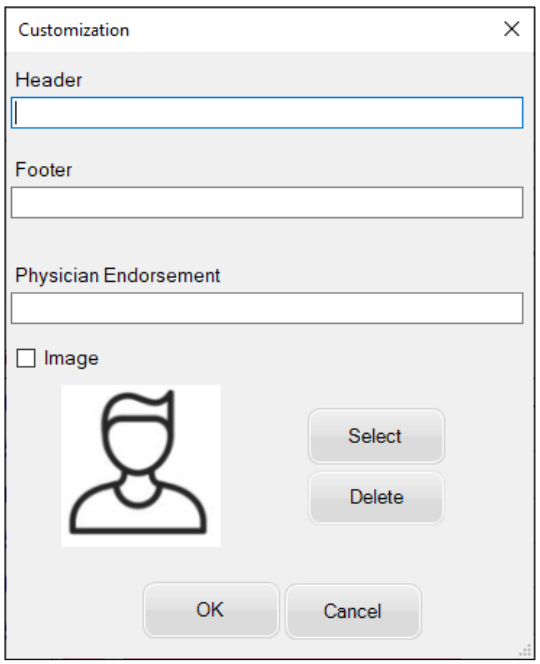
Important: The analysis **always** refers to the **current** age of the patient.
Displaying a patient's history requires one print per appointment.

Note

You can set BP limits for each patient individually on the Patient Information pane. BP Limits affect the calculation for the graphs and reports.

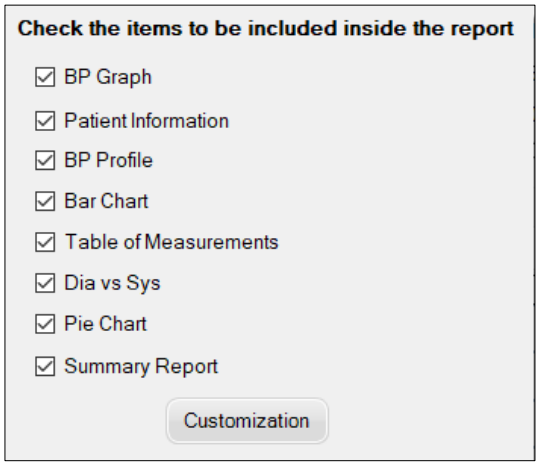
ABPM Customized Report

Customization allows defining the report **Header title**, **Footer title**, and **Physician Endorsement** with an option for digital signature (see following Figure).



1. On the **ABPM Review Screen**, click the **Customized Report** button.

   The **Customization** Dialog Box is opened (see following Figure).



Select the ☑ of the items to be included in the report (see Figure above).

The selected items are saved (as global settings). Default settings include all reports.

Click **Customization** (see Figure above).

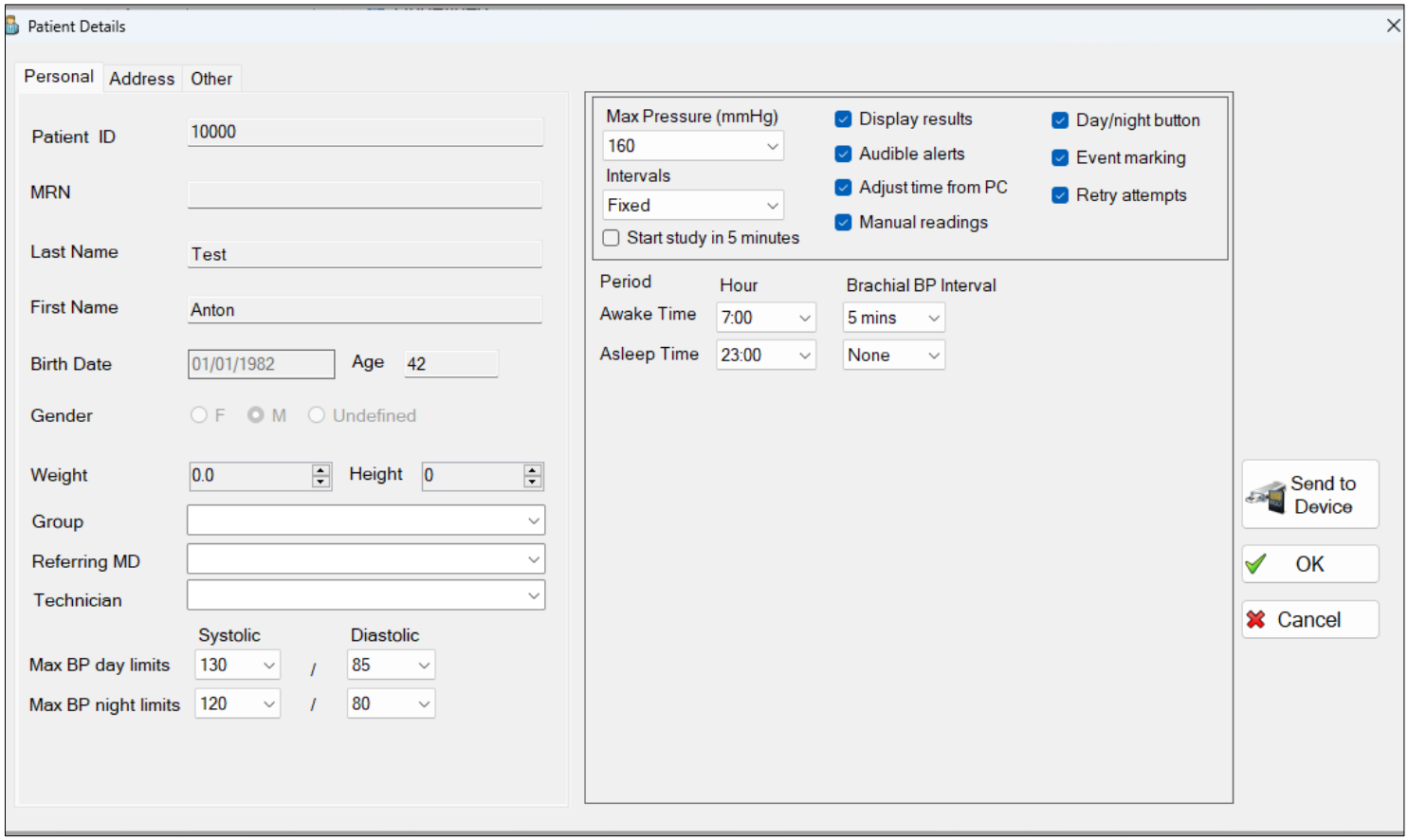
Preparing ABPM Recorder for Test

See following Figures.

Preparing the ABPM recorder for an ABP study involves filling out an onscreen form to set the parameters for your study to be programmed into the monitor.

You can also use a template to fill out the form. Templates help ensure consistent programming and adherence to specific protocols. The NBP One Software provides default templates, or you can create your own.

UI Item	Description
Patient ID	Patient ID for reporting and referencing data.
Patient name	Enter patient name (first, middle, last).
Measurement Schedule:	Specifies when and how often the monitor takes readings. For Awake time and Sleep time, select from the Hour pull-down menu to establish the start time for these periods. From the BP Interval pull-down menu, select the desired interval between readings (none, 5, 10, 15, 20, 30, 45, 60, 90 or 120 minutes).
Start study in 5 minutes:	Slider denotes that the study will start automatically after programming; unchecked denotes that the study will be started with the first press of the Start/Stop button when the monitor is powered ON.
Max Pressure	Establishes the maximum inflation pressure for the monitor (options between 160 and 280 mmHg). Suggested setting is 30 mmHg above the highest expected systolic BP. NOTE: The ABP monitor will not inflate to Max Pressure with each reading; instead it inflates to 30 mmHg above the previous systolic reading.
Intervals	Set interval type. Select **Fixed** to set the intervals to exact times. Select **Standard** for +/- 5 minutes around the selected intervals.
Display results	When on, allows the patient to view the results immediately after a measurement. NOTE: Display Results is always on for the first 30 minutes of study.
Manual readings	When on, allows the patient to take measurements outside of the scheduled program using the Start/Stop key. If manual readings are disabled/off, ***Start Study in 5 minutes MUST be enabled/on.*** If Start study in 5 minutes is enabled/on, user can elect to enable/on or disable/off manual readings NOTE: Start study in 5 minutes requires the batteries to be inserted during programming. NOTE: Manual Readings is always ON for the first 30 minutes of the study.
Audible alerts	Play an alert sound at the beginning and upon completion of each reading, during the awake period only.
Retry attempts	The monitor will reattempt a measurement that initially fails.
Day/night button	When on, enables the Day/Night button on the monitor, allowing the patient to start the Awake and Sleep periods according to their daily schedule. A period can be activated to four hours before the programmed period begins. The monitor will also record the time the day/night button is pressed.
Event marking	When enabled, allows the patient to mark up to 30 events during the study.

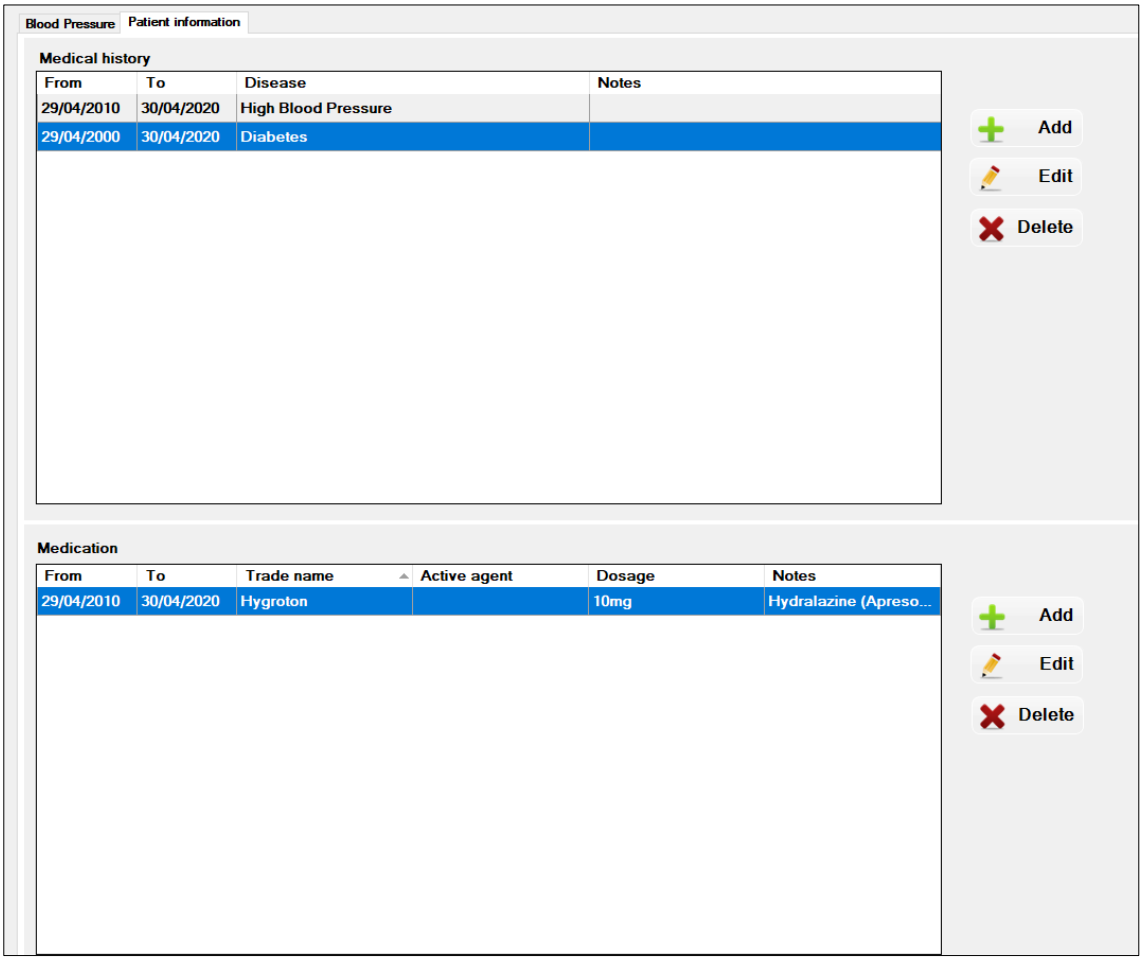

Patient Details
Personal
Address
Other
Patient ID
10000
MRN
Last Name
Test
First Name
Anton
Birth Date
01/01/1982
Age
42
Gender
F
M
Undefined
Weight
0.0
Height
0
Group
Referring MD
Technician
Systolic
Diastolic
Max BP day limits
130
/
85
Max BP night limits
120
/
80
Max Pressure (mmHg)
160
Intervals
Fixed
Start study in 5 minutes
Display results
Audible alerts
Adjust time from PC
Manual readings
Day/night button
Event marking
Retry attempts
Period
Hour
Brachial BP Interval
Awake Time
7:00
5 mins
Asleep Time
23:00
None
Send to Device
OK
Cancel

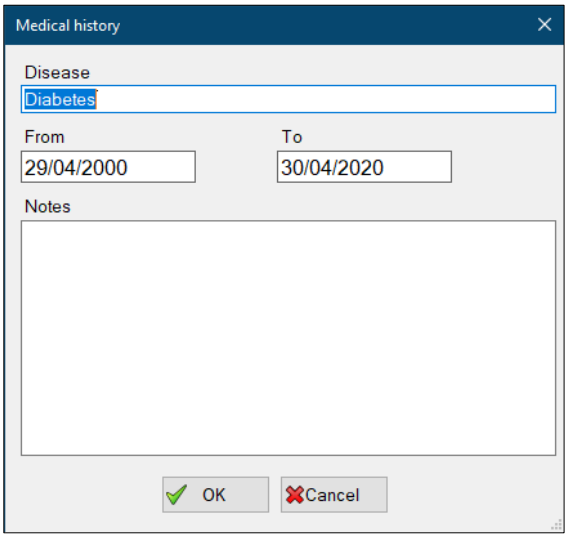
Editing Patient Medical Info History

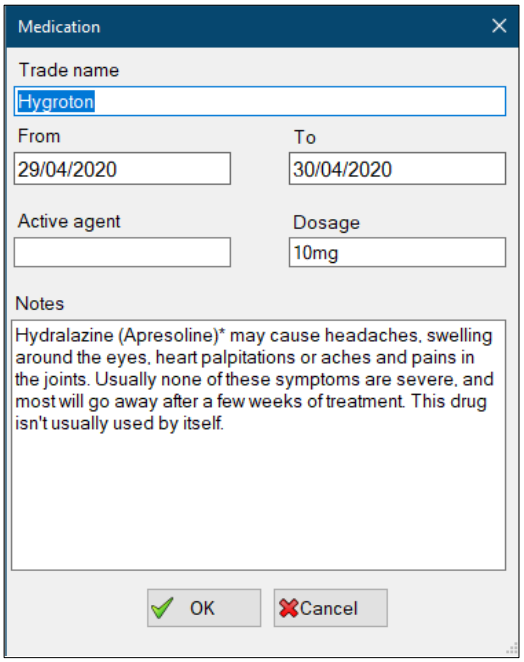
(See Section Patient Information).

The purpose is allowing the user to modify medical history and medications for awareness of the physician/clinicians (see Figure below).

The user can add/edit/delete medical history (diseases) and medications (see Figures below).



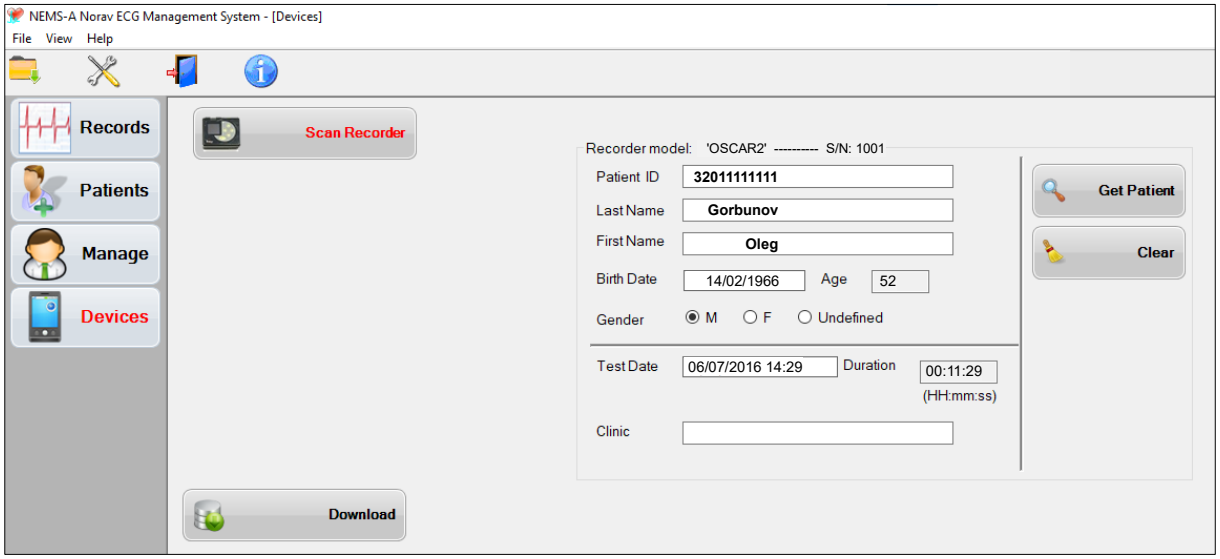




1. To add **Medical History** and **Medication**, click the Add button.
2. Enter the **Disease** name in the **Disease field** and/or **Medication Trade Name** in the **Trade name** field.
3. Enter the **From** and **To** dates in the **Medical History** and in the **Medication** Dialog Boxes.
4. On the **Medication** Dialog Box, enter the **Agent's Name** in the **Active Agent** field, and the **Medication Dosage** in the **Dosage** field.
5. Enter notes in the **Medical History** and in the **Medication** Dialog Boxes.
6. To save, click OK or click Cancel to abort.
7. To edit existing Diseases and/or Medications click Edit, make changes, and then click OK to save.
8. To delete existing Diseases and/or Medications, select (highlight) the Diseases and/or Medications for deletion, and click Delete.

Downloading ABPM Recording

See following Figure and Section Downloading ABPM Recording from NBP One Recorder.

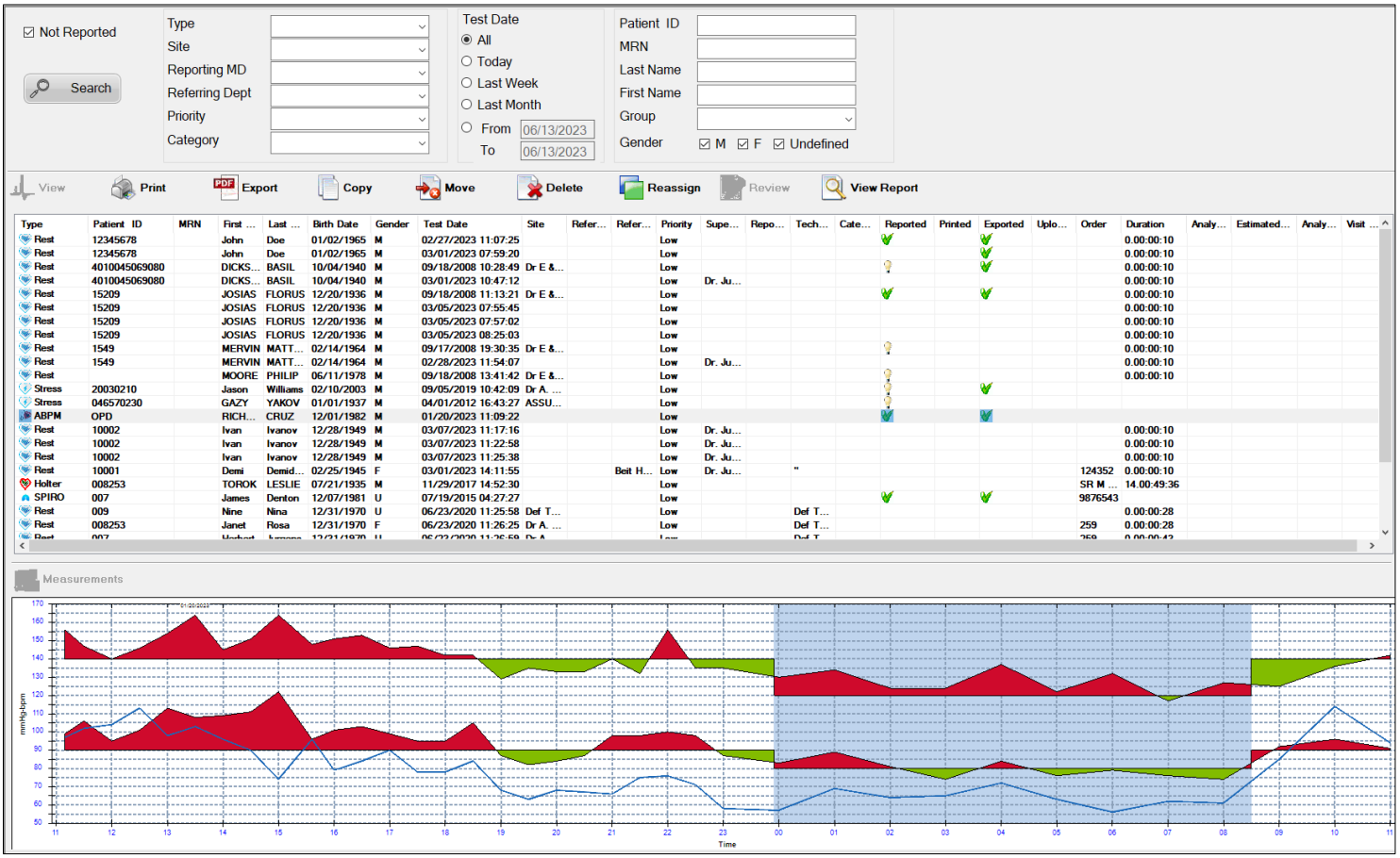


Previewing Test Results

See following Figure.

Preview the ABPM results in the Records window. The blood pressure profile graph is displayed when clicking on a specific patient record.

The common layout is like the Resting ECG preview window (setup-enabled).



The white areas represent **Awake Time**, and the blue-highlighted area represent **Asleep Time**.

The top chart is the **Systolic BP chart**, and the bottom chart is the **Diastolic BP chart**.

The **red** areas represent **BP higher than the BP Limit** (preset per patient before ABPM), which is represented by the straight horizontal line on the bottom of the **red** areas.

The **green** areas represent **BP lower than the BP Limit** (preset per patient before ABPM), which is represented by the straight horizontal line above the **green** areas.

The **blue** chart, which is superimposed on the bottom Diastolic BP chart, is the HR chart.

Reviewing ABPM Recording

See Section Reviewing ABPM Recording in NEMS-A.

You can access all functions from the main ABPM window (see Figure below). More windows may appear depending on the function.

Patient & Test Information Panel (left side)

Patient ID, MRN, Last Name, First Name, Birth Date, Age, Gender, Weight, Height, Order (Test-ID), Test Date, ABPM Recorder Type, Serial Number

Common Actions Toolbar (on top of BP measurements table)

Print, Export, Preview Report, View Report, Customized Report, Send Report, Save Report

ABPM Review Panel

BP Measurements Table

Referring MD, Reporting MD, Technician drop-down menus

Physician Comments text field

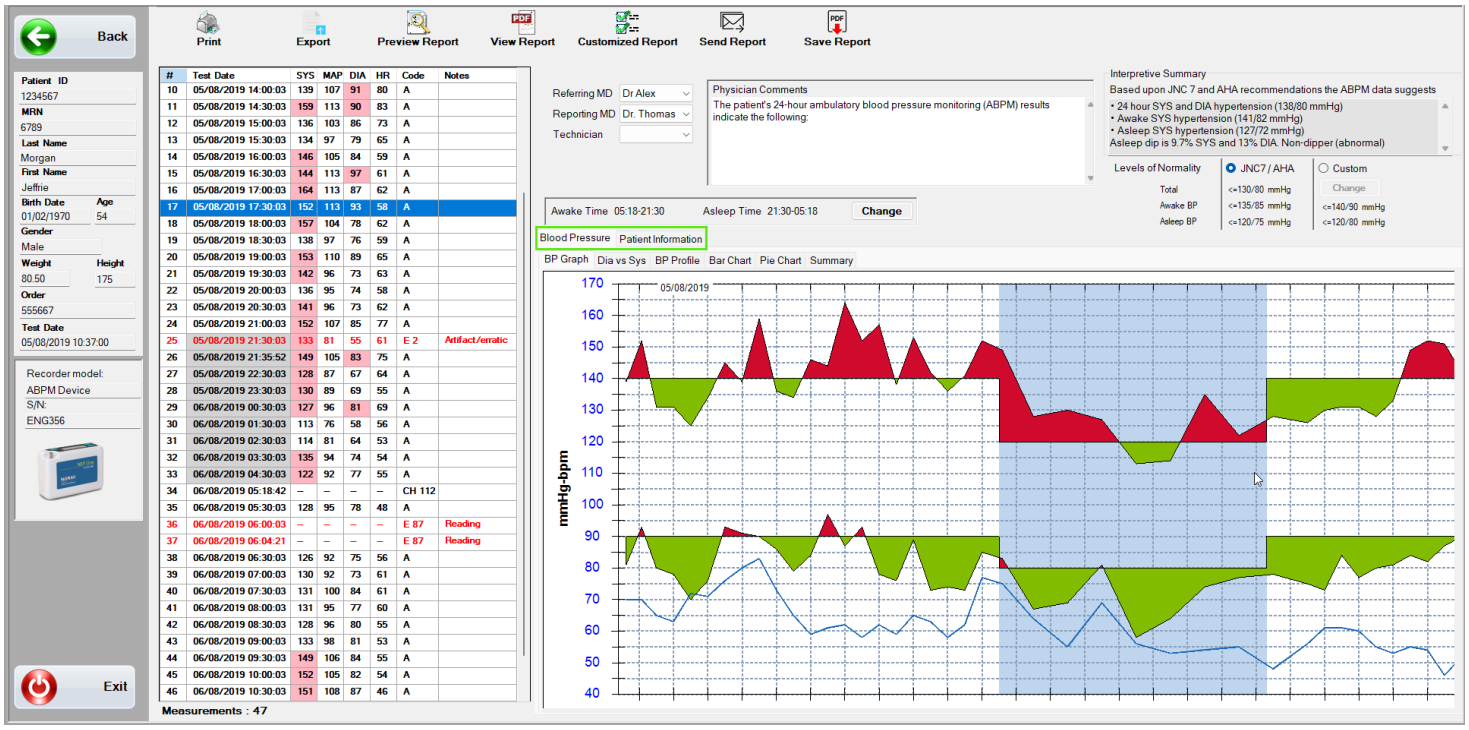
Awake Time, Asleep Time parameters

Interpretive Summary (automatically generated based on the test results)

BP Limits as JNC7/AHA or Custom blood pressure thresholds.

Blood Pressure Tab with BP Graph (default) and related subtabs.

Patient Information Tab, containing Medical History and Medication sections.

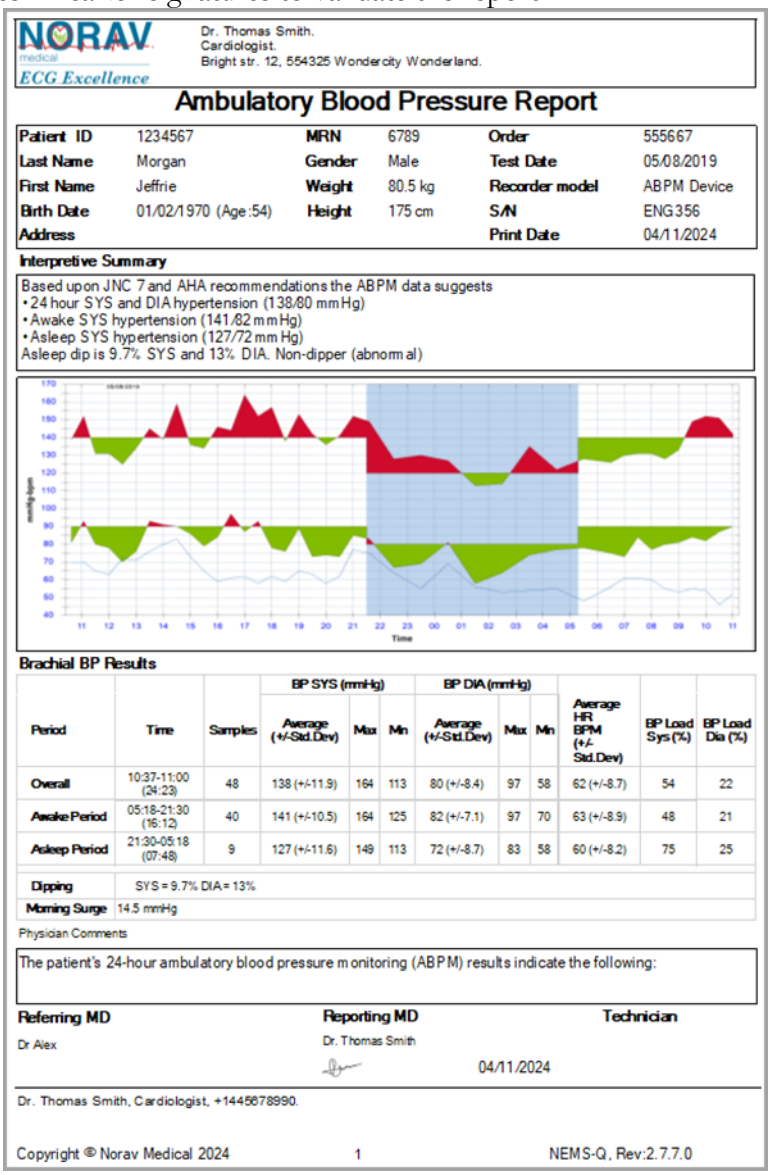


Report Types

Ambulatory Blood Pressure Report

The Ambulatory Blood Pressure Report page contains the following sections:

- Header: Contains the credentials of the specialist reviewing the report.
- Patient Information: Displays patient details relevant to the report.
- Interpretive Summary: An automatically generated summary based on the test results.
- Blood Pressure Graph: Visual representation of the patient's blood pressure over time.
- Brachial BP Results Table: Summarizes brachial blood pressure measurements.
- Physician Comments: Section for physician observations and notes.
- Signatures: Area for signatures to validate the report.



NORAV medical ECG Excellence

Dr. Thomas Smith.
Cardiologist.
Bright str. 12, 554325 Wondercity Wonderland.

Ambulatory Blood Pressure Report

Patient ID	1234567	**MRN**	6789	**Order**	555667
Last Name	Morgan	**Gender**	Male	**Test Date**	05/08/2019
First Name	Jeffrie	**Weight**	80.5 kg	**Recorder model**	ABPM Device
Birth Date	01/02/1970 (Age:54)	**Height**	175 cm	**S/N**	ENG356
Address				**Print Date**	04/11/2024

Interpretive Summary

Based upon JNC 7 and AHA recommendations the ABPM data suggests
• 24 hour SYS and DIA hypertension (138/80 mmHg)
• Awake SYS hypertension (141/82 mmHg)
• Asleep SYS hypertension (127/72 mmHg)
Asleep dip is 9.7% SYS and 13% DIA. Non-dipper (abnormal)

Brachial BP Results

Period	Time	Samples	BP SYS (mmHg) Average (+/-Std.Dev)	Max	Min	BP DIA (mmHg) Average (+/-Std.Dev)	Max	Min	Average HR BPM (+/- Std.Dev)	BP Load Sys (%)	BP Load Dia (%)
Overall	10:37-11:00 (24:23)	48	138 (+/-11.9)	164	113	80 (+/-8.4)	97	58	62 (+/-8.7)	54	22
Awake Period	05:18-21:30 (16:12)	40	141 (+/-10.5)	164	125	82 (+/-7.1)	97	70	63 (+/-8.9)	48	21
Asleep Period	21:30-05:18 (07:48)	9	127 (+/-11.6)	149	113	72 (+/-8.7)	83	58	60 (+/-8.2)	75	25

Dipping	SYS = 9.7% DIA = 13%
Morning Surge	14.5 mmHg

Physician Comments

The patient's 24-hour ambulatory blood pressure monitoring (ABPM) results indicate the following:

Referring MD Dr Alex

Reporting MD Dr. Thomas Smith 04/11/2024

Technician

Dr. Thomas Smith, Cardiologist, +1445678990.

BP Graph (Middle Pane)

See following Figure.

The left-hand Y-axis with the mmHg units applies to systolic, diastolic, and mean BP values.

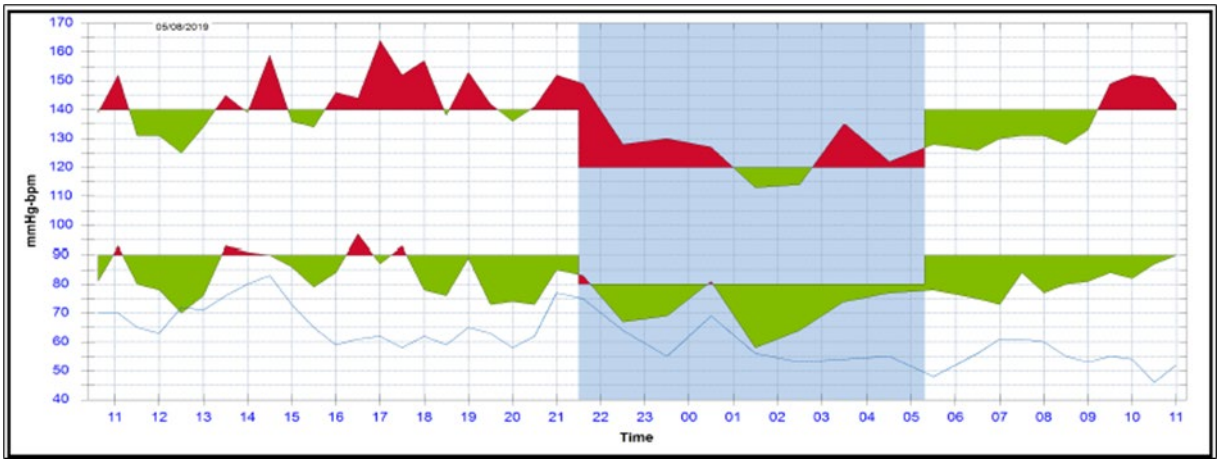
The X-axis applies to time (hour).

The daily intervals are highlighted (Awake Time in white, Asleep Time in light blue).

Day counts all daytime intervals together.

Note

You can set these values when preparing for a new ABPM test.



The blue-line (Y-axis) with the HR units (BPM) applies to heart rate.

Brachial BP Results (Bottom Pane)

See following Figure.

Brachial BP Results

Period	Time	Samples	BP SYS (mmHg) Average (+/-Std.Dev)	Max	Min	BP DIA (mmHg) Average (+/-Std.Dev)	Max	Min	Average HR BPM (+/- Std.Dev)	BP Load Sys (%)	BP Load Dia (%)
Overall	10:37-11:00 (24:23)	48	138 (+/-11.9)	164	113	80 (+/-8.4)	97	58	62 (+/-8.7)	54	22
Awake Period	05:18-21:30 (16:12)	40	141 (+/-10.5)	164	125	82 (+/-7.1)	97	70	63 (+/-8.9)	48	21
Asleep Period	21:30-05:18 (07:48)	9	127 (+/-11.6)	149	113	72 (+/-8.7)	83	58	60 (+/-8.2)	75	25

Dipping	SYS = 9.7% DIA = 13%
Morning Surge	14.5 mmHg

Physician Comments

The patient's 24-hour ambulatory blood pressure monitoring (ABPM) results indicate the following:

Referring MD	Reporting MD	Technician
Dr Alex	Dr. Thomas Smith	
	04/11/2024	

Dr. Thomas Smith, Cardiologist, +1445678990.

Period – **Overall** (awake & asleep periods) **Awake Period**, **Asleep Period**, **Dipping** (the percentage of low systolic and diastolic BP during night relative to daytime), and **Morning Surge** (the increase in systolic and diastolic BP during early morning hours relative to nighttime)

Time – **from** hour - **to** hour (number of hours)

Samples – The number of samples

BP SYS [mmHg]: Average (+/-Std.Dev), Max, Min – Average systolic BP in mmHg (±BP deviation), Maximum and Minimum values.

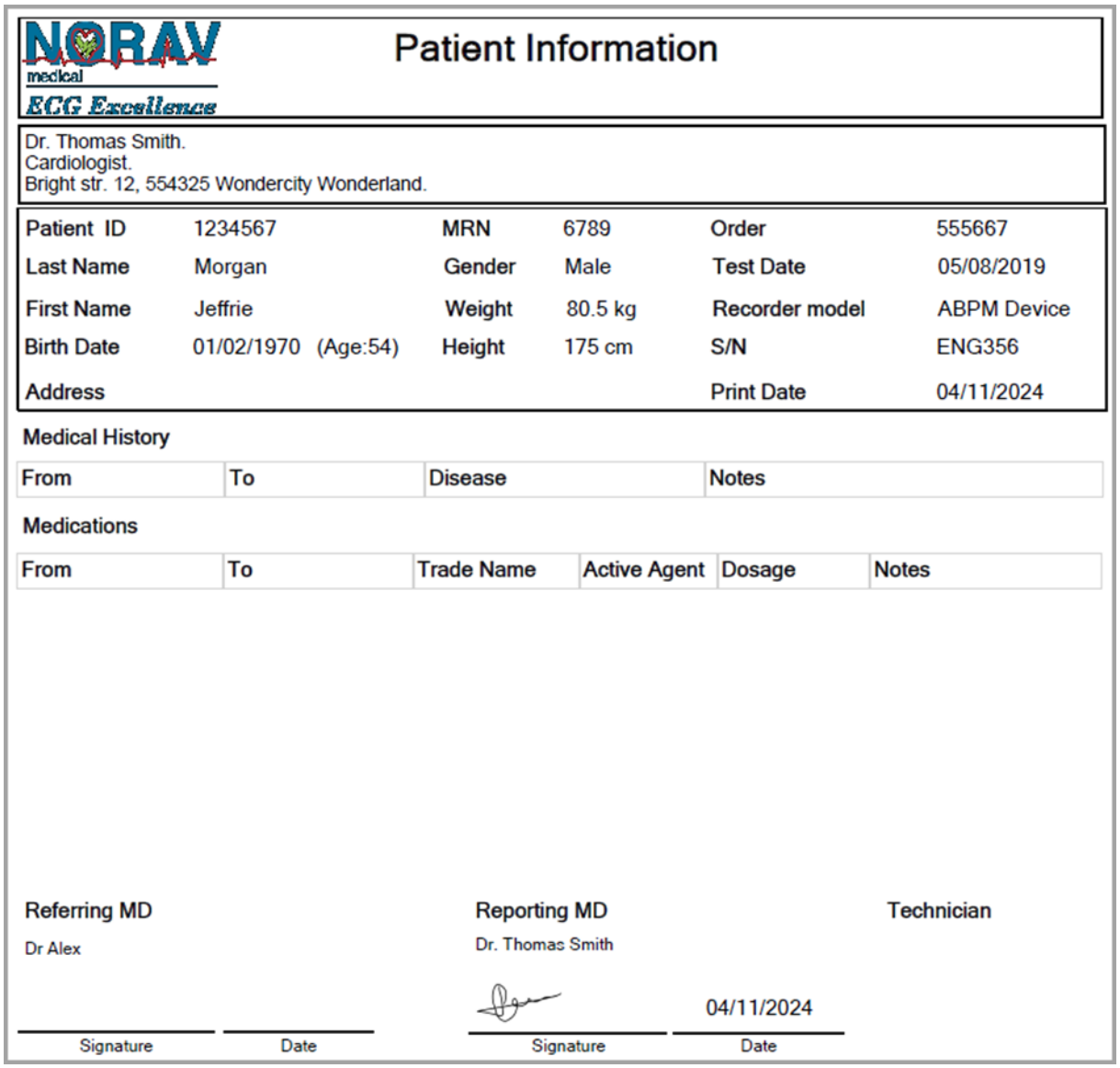
BP DIA [mmHg] (+/-Std.Dev) – Average diastolic BP in mmHg (±BP deviation), Maximum and Minimum values.

Average HR BPM (+/-Std.Dev) – Average HR in BPM (±BPM deviation)

BP Load Sys (%) –Percentage of abnormally elevated systolic BP readings relative to normal

BP Load Dia (%) –Percentage of abnormally elevated diastolic BP readings relative to normal

Patient Information



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Patient Information

Dr. Thomas Smith.
Cardiologist.
Bright str. 12, 554325 Wondercity Wonderland.

Patient ID	1234567	MRN	6789	Order	555667
Last Name	Morgan	Gender	Male	Test Date	05/08/2019
First Name	Jeffrie	Weight	80.5 kg	Recorder model	ABPM Device
Birth Date	01/02/1970 (Age:54)	Height	175 cm	S/N	ENG356
Address				Print Date	04/11/2024

Medical History

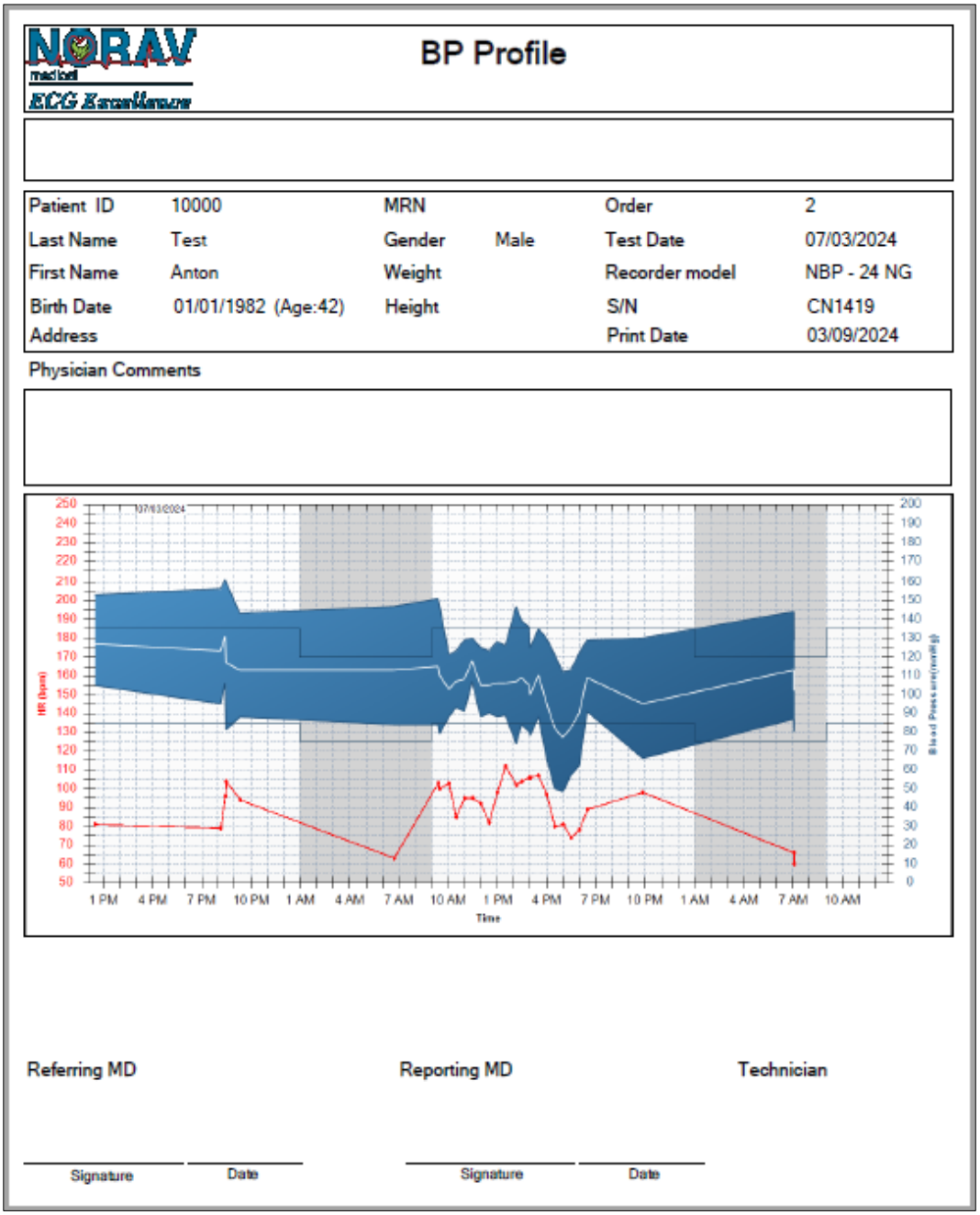
From	To	Disease	Notes

Medications

From	To	Trade Name	Active Agent	Dosage	Notes

Referring MD		Reporting MD		Technician
Dr Alex		Dr. Thomas Smith		
Signature	Date	Signature	Date	
			04/11/2024	

BP Profile



The right-hand Y-axis with mmHg units applies to Systolic, Diastolic, and mean BP values.

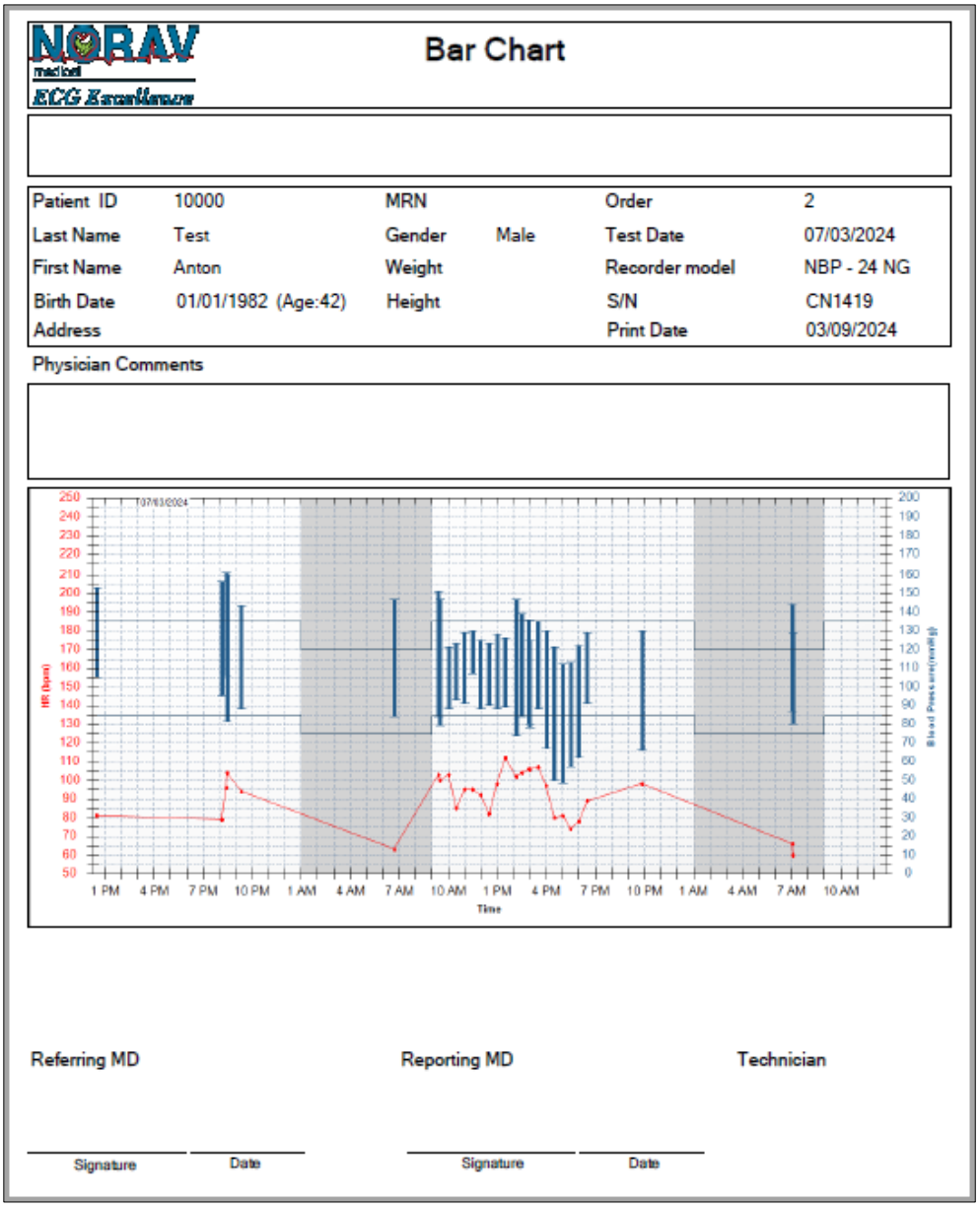
The left-hand Y-axis with the BPM units applies to heart rate (HR).

The X-axis applies to time.

The daily intervals are highlighted (Awake Time in white, Asleep Time in gray).

Day counts all three daytime intervals together.

Bar Chart



In this profile, the following values of the test series are displayed graphically in a bar chart as a function of time:

Systolic values

Median values

Diastolic values

Heart rate

The right-hand BP Y-axis with mmHg units applies to Systolic, Diastolic, and mean BP values.

The left-hand HR Y-axis with BPM units applies to heart rate.

The X-axis applies to time (hours).

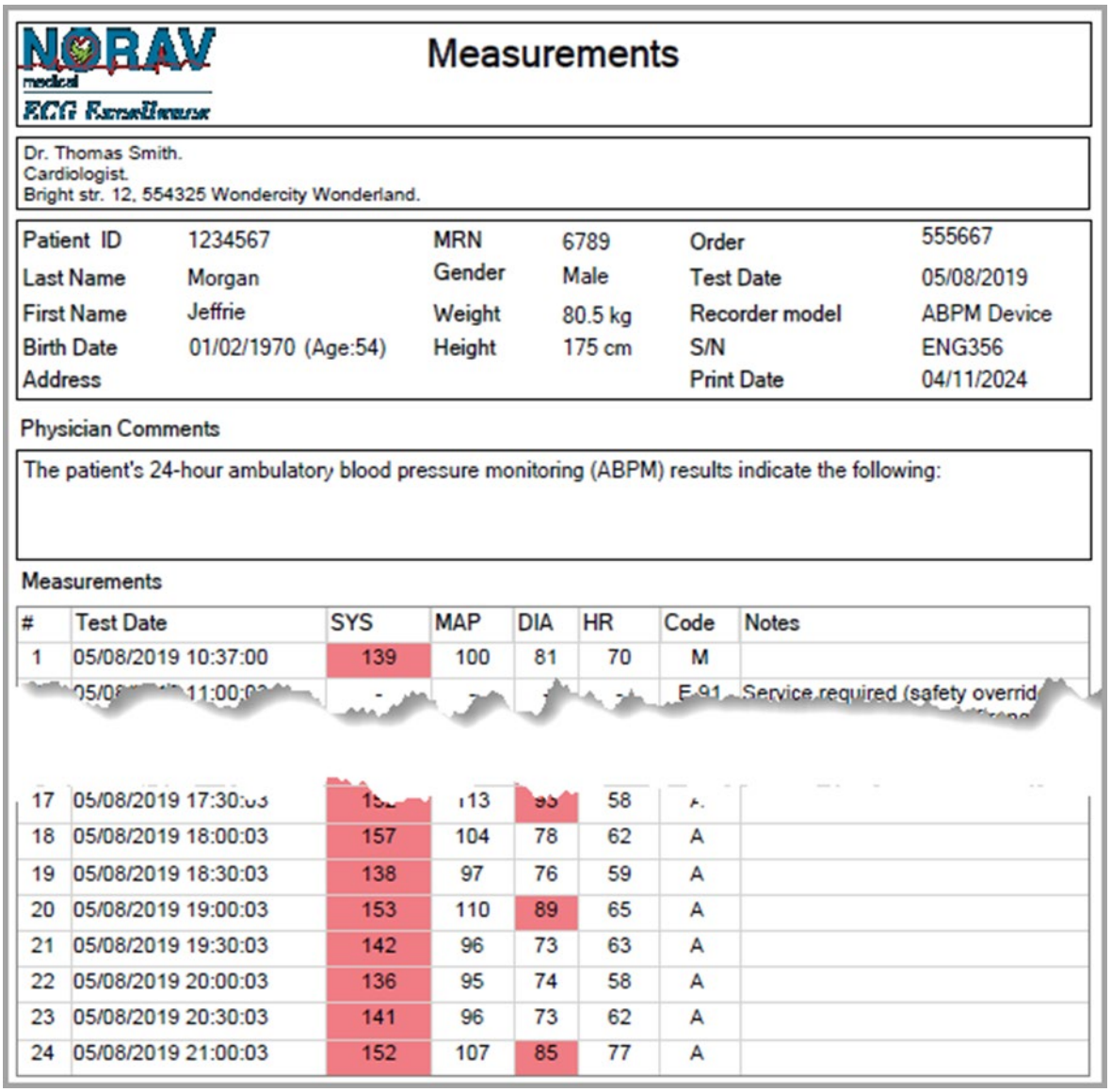
The daily intervals are highlighted (Awake Time in white, Asleep Time in gray).

Day counts all three daytime intervals together.

Note

You can set these values when preparing for a new ABPM Test.

Measurements



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Measurements

Dr. Thomas Smith.
Cardiologist.
Bright str. 12, 554325 Wondercity Wonderland.

Patient ID	1234567	MRN	6789	Order	555667
Last Name	Morgan	Gender	Male	Test Date	05/08/2019
First Name	Jeffrie	Weight	80.5 kg	Recorder model	ABPM Device
Birth Date	01/02/1970 (Age:54)	Height	175 cm	S/N	ENG356
Address				Print Date	04/11/2024

Physician Comments

The patient's 24-hour ambulatory blood pressure monitoring (ABPM) results indicate the following:

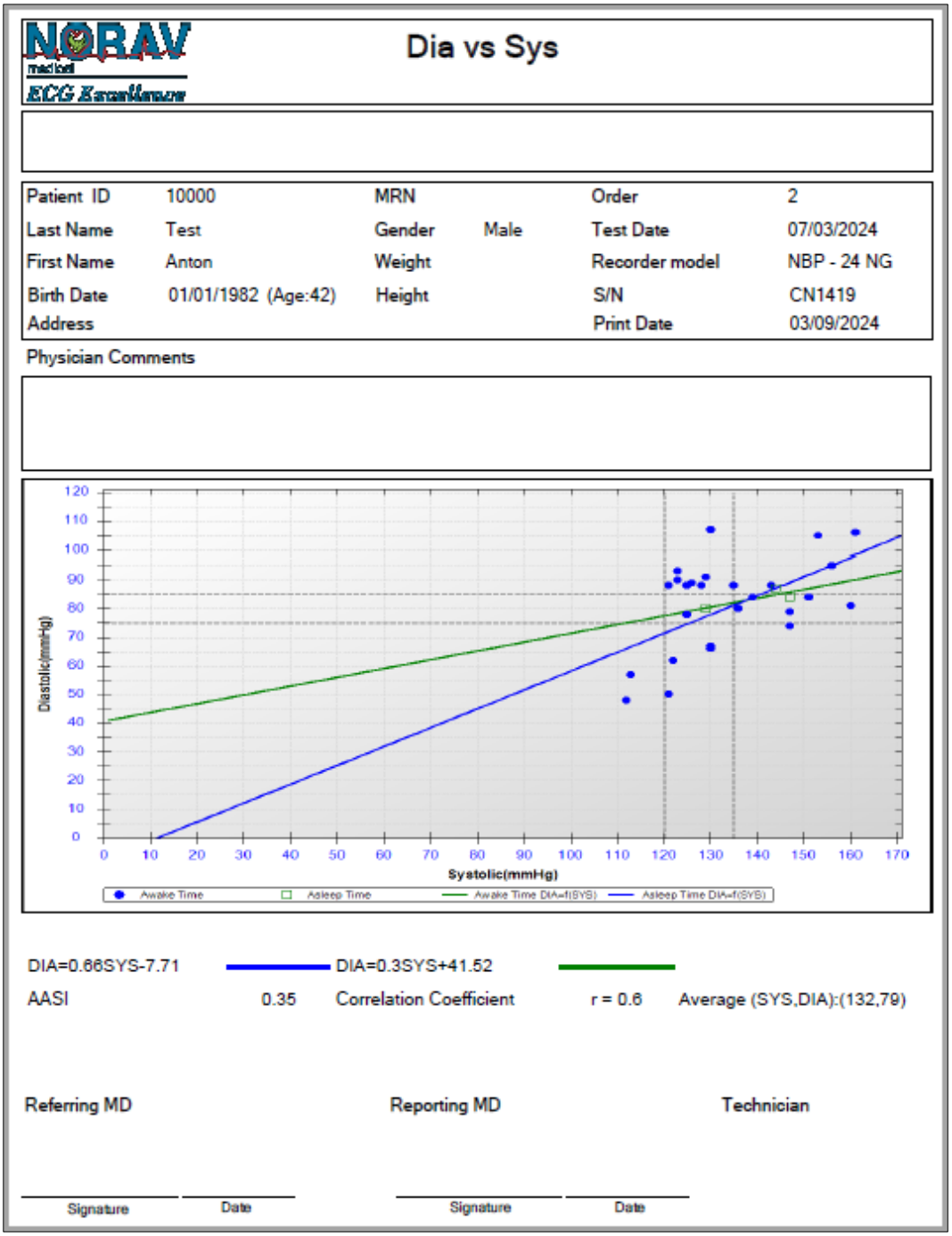
Measurements

#	Test Date	SYS	MAP	DIA	HR	Code	Notes
1	05/08/2019 10:37:00	139	100	81	70	M	
	05/08/2019 11:00:03	-	-	-	-	E-91	Service required (safety overrid
17	05/08/2019 17:30:03	152	113	85	58	A	
18	05/08/2019 18:00:03	157	104	78	62	A	
19	05/08/2019 18:30:03	138	97	76	59	A	
20	05/08/2019 19:00:03	153	110	89	65	A	
21	05/08/2019 19:30:03	142	96	73	63	A	
22	05/08/2019 20:00:03	136	95	74	58	A	
23	05/08/2019 20:30:03	141	96	73	62	A	
24	05/08/2019 21:00:03	152	107	85	77	A	

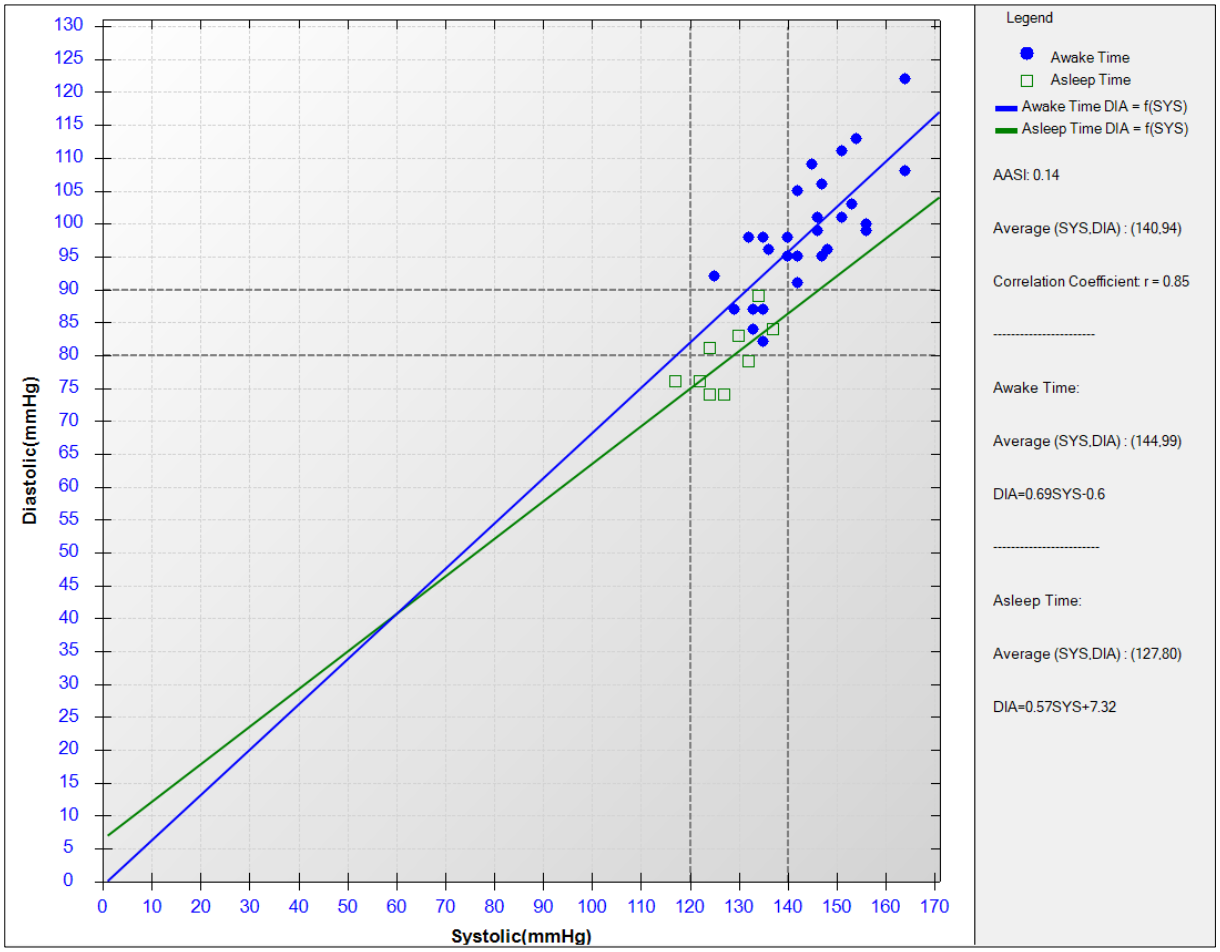
The measurement in red indicates exceeding the defined limit for both systolic and diastolic BP.

The **Notes** column in the **Measurements** table is important, notifying the user about error(s) occurred during taking measurement(s).

Diastolic vs Systolic Graph



This diagram shows the correlation of diastolic to systolic blood pressure (see following Figure). Each ● and □ corresponds to one measurement. You can see the BP limits as horizontal (Systolic) and vertical (Diastolic) set-point curves.



Legend Awake Time Asleep Time Awake Time DIA = f(SYS) Asleep Time DIA = f(SYS)	The ● dots are BP measurements taken during the Awake Time and the **blue** chart line represents the average of the blue dots. The □ squares are BP measurements taken during the Asleep Time and the **green** chart line represents the average of the green squares.
AASI: 0.14 Average (SYS,DIA) : (140,94) Correlation Coefficient: r = 0.85	**AASI: 0.14** – Ambulatory Arterial Stiffness Index, calculated from a set of data collected during a 24-hour ABPM, is defined as 1 minus the regression slope of diastolic on systolic blood pressure (BP) values. **Average (SYS,DIA): (140.94)** – Overall average of Systolic and Diastolic BP **Correlation Coefficient: r=0.85** – A numerical measure of correlation between Systolic and Diastolic BPs, meaning a statistical relationship between two variables.
Awake Time: Average (SYS,DIA) : (144,99) DIA=0.69SYS-0.6	Awake Time: **Average (SYS,DIA): (144.99)** – Average of Systolic and Diastolic BP during Awake Time **DIA=0.69SYS-0.6** – Awake-Time graph equation
Asleep Time: Average (SYS,DIA) : (127,80) DIA=0.57SYS+7.32	Asleep Time: **Average (SYS,DIA): (127.80)** – Average of Systolic and Diastolic BP during Asleep Time **DIA=0.69SYS-0.6** – Asleep-Time graph equation

Pie Chart

The values of one measurement series are analyzed according to the BP limits set.

The Systolic and Diastolic pie charts show the percentages of measurements as follows:

Acceptable	
Too High	
Normal	

Summary Report

NORAV medical
ECG Excellence

Summary Report

Dr. Thomas Smith.
Cardiologist.
Bright str. 12, 554325 Wondercity Wonderland.

Patient ID	1234567	MRN	6789	Order	555667
Last Name	Morgan	Gender	Male	Test Date	05/08/2019
First Name	Jeffrie	Weight	80.5 kg	Recorder model	ABPM Device
Birth Date	01/02/1970 (Age:54)	Height	175 cm	S/N	ENG356
Address				Print Date	04/11/2024

Summary

Period	Time	Samples	Valid Samples	Valid Samples (%)	BP Load Sys (%)	BP Load Dia (%)	Maximum SYS	Maximum DIA	Minimum SYS	Minimum DIA
Overall	05/08/2019 10:37 06/08/2019 11:00 (24:23)	48	41	85	54	22	164	97	113	58
Awake Period	05:18-21:30 (16:12)	40	33	82	48	21	164	97	125	70
Asleep Period	21:30-05:18 (07:48)	9	8	89	75	25	149	83	113	58
Dipping	SYS = 9.7% DIA = 13% <0% Inverted; <10% Non-Dipper; <20% Normal; >=20% Extreme									
Morning Surge	14.5 mmHg									

Average Values

	Awake Period		Asleep Period		Overall	
Measurements	Value	Goal	Value	Goal	Value	Goal
SYS (mmHg)	141	<135	127	<120	138	<130
DIA (mmHg)	82	<85	72	<75	80	<80
MAP (mmHg)	141		127		138	
HR (BPM)	63		60		62	
PP (mmHg)	140		127		138	

Referring MD		Reporting MD		Technician
Dr Alex		Dr. Thomas Smith	04/11/2024	
Signature	Date	Signature	Date	

Working with the NBP One ABPM Recorder

The following operations are specific for operating NEMS-A with the NBP One ABPM recorder:

Preparing NBP One Recorder for New ABPM Test.

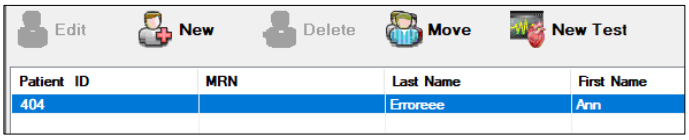
Downloading ABPM Recording from NBP One Recorder.

Reviewing ABPM Recording in NEMS-A.

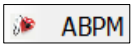
Preparing NBP One Recorder for New ABPM Test

1. Make sure the NBP One recorder is connected to the PC USB port.
2. To open the **Patients Screen**, click the 

tab and search for the patient whose NBP One recorder you want to prepare.
3. Click on the selected patient on the list (the row is highlighted in blue) – see Figure below.



Click the 

button, and then select the 

test type.

The **Patient Details** Dialog Box is displayed.

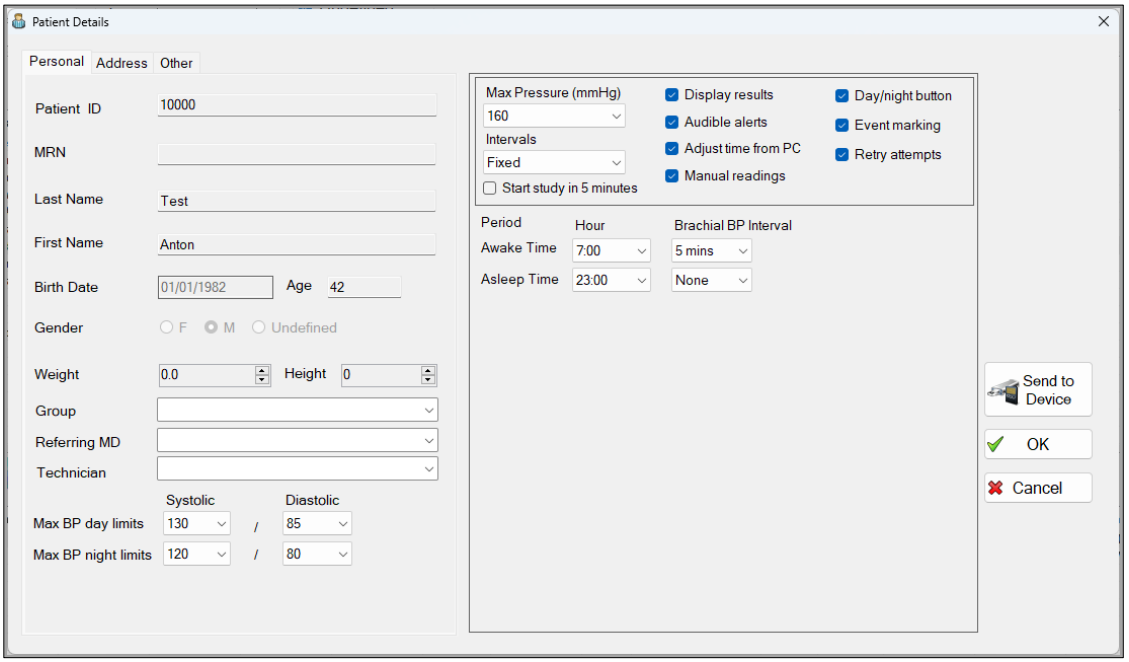


Figure 192: Patient Details Dialog Box

Validate the patient details, configure the ABPM protocol settings, select the Referring MD and Technician from drop-down menus, and then click the 

button.

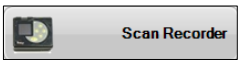
Wait until the **Prepare** operation is finished.

Disconnect the NBP One recorder from the PC.

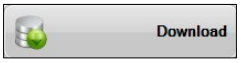
Downloading ABPM Recording from NBP One Recorder

1. Make sure the NBP One recorder is connected to the PC USB port.

Click the 

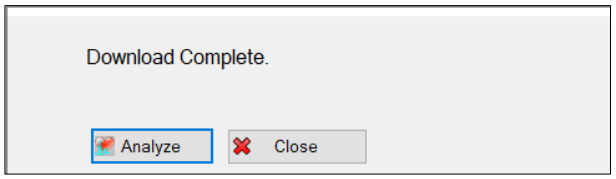
tab, and then click the 

button.

Validate or edit the patient details, and then click the 

button.

When downloading is finished, the **Download Complete** Dialog Box is displayed (see Figure below).



After the **Download Complete** Dialog Box appears, disconnect the NBP One recorder from the PC.

Reviewing ABPM Recording in NEMS-A

1. Click the Records tab.
2. Search for a specific recording.
3. Select (highlight) the recording, and then click the Review button.

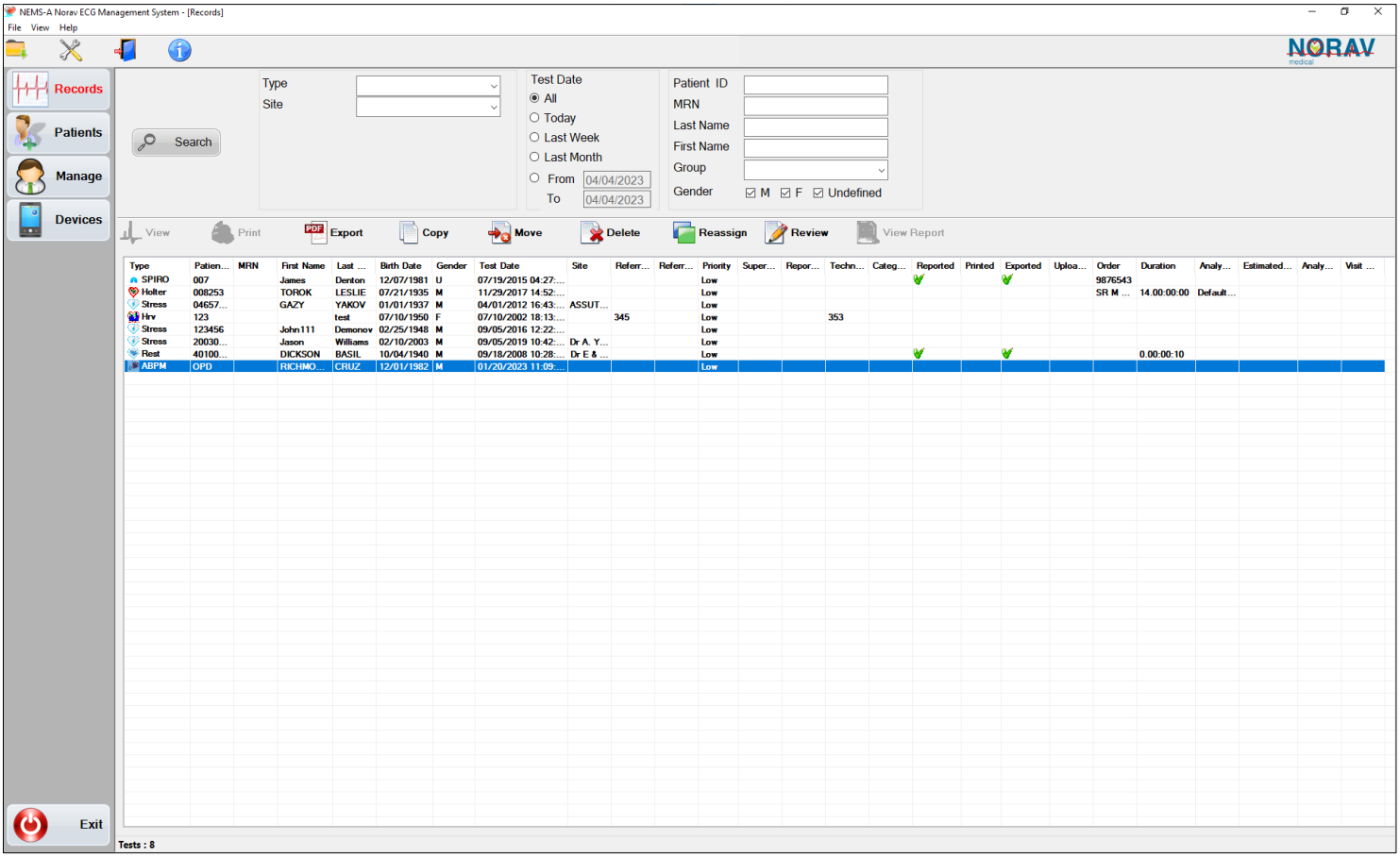


Figure 193: Selecting ABPM Test for Review

The **ABPM Review Screen** is displayed.

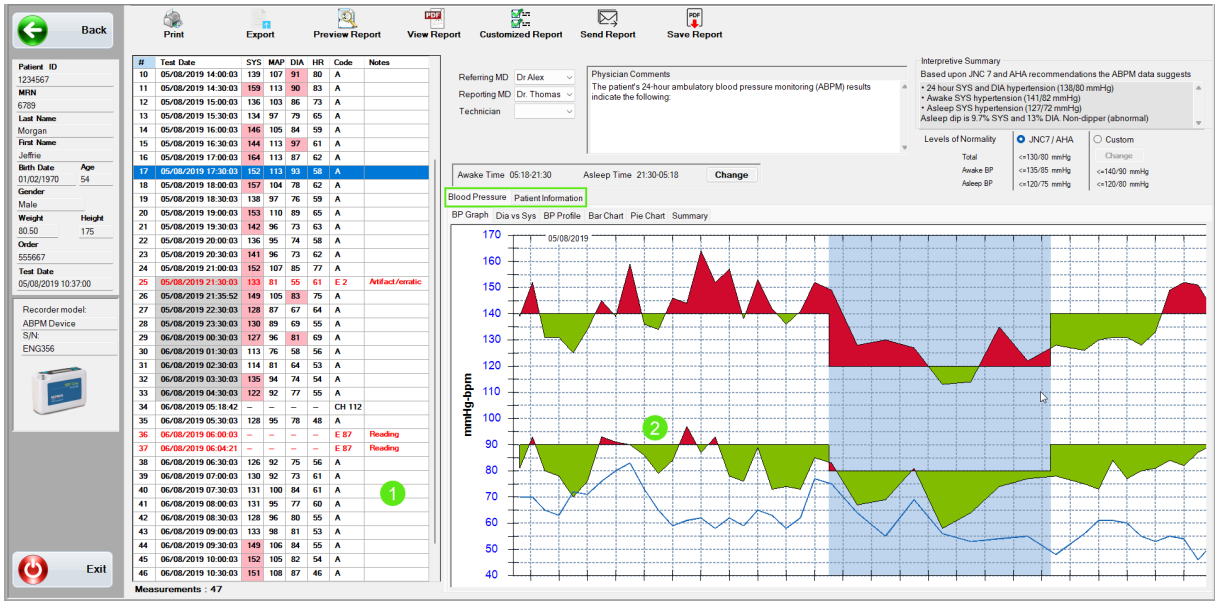


Figure 194: ABPM Review Screen

1. **BP Measurements Table**

2. BP Graph

Review the ABPM measurements and write comments in the Physician Comments field.

To generate the report preview, click the Preview Report button above the ABPM measurement list.

The **ABPM Report Preview** is displayed.

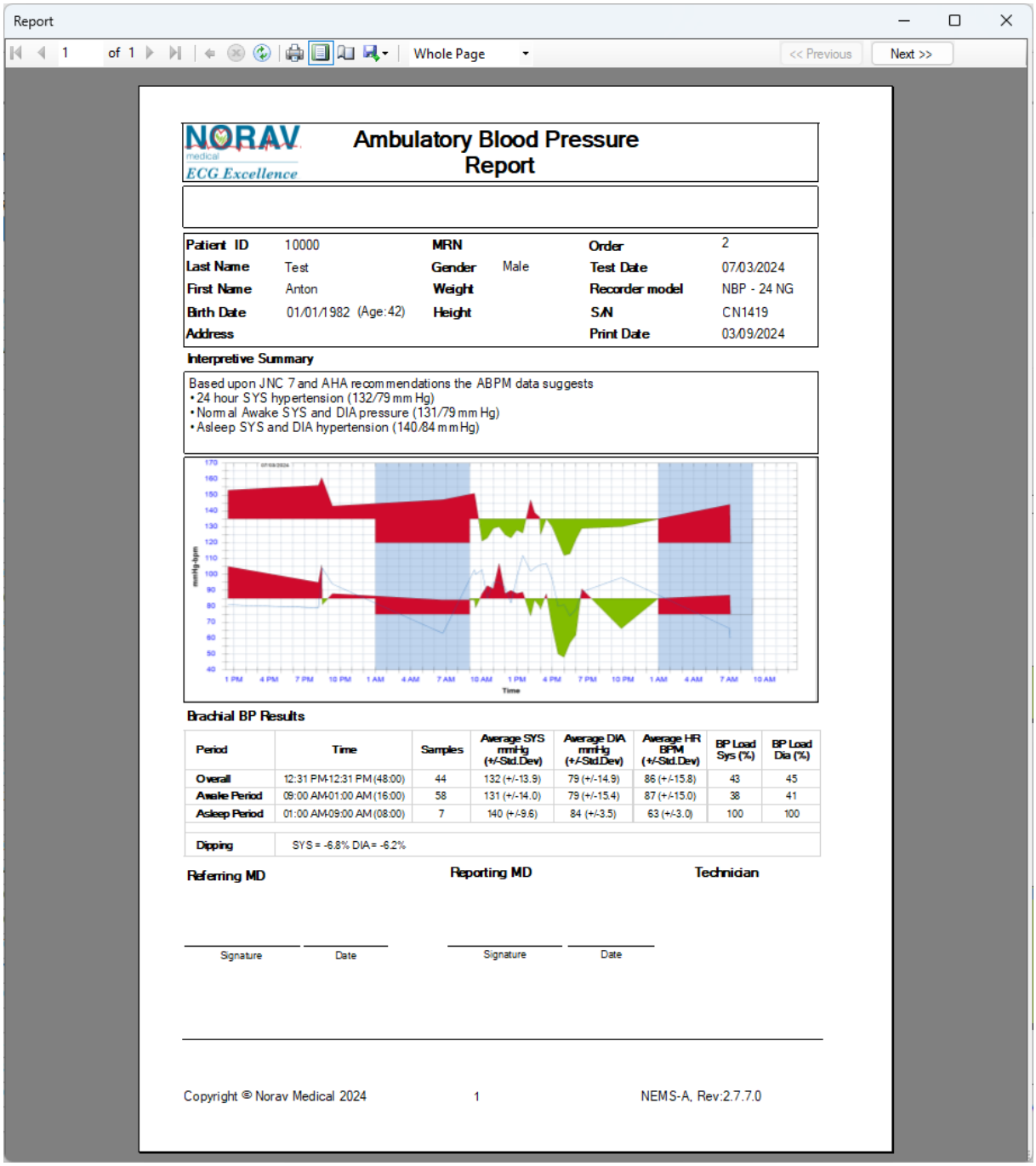
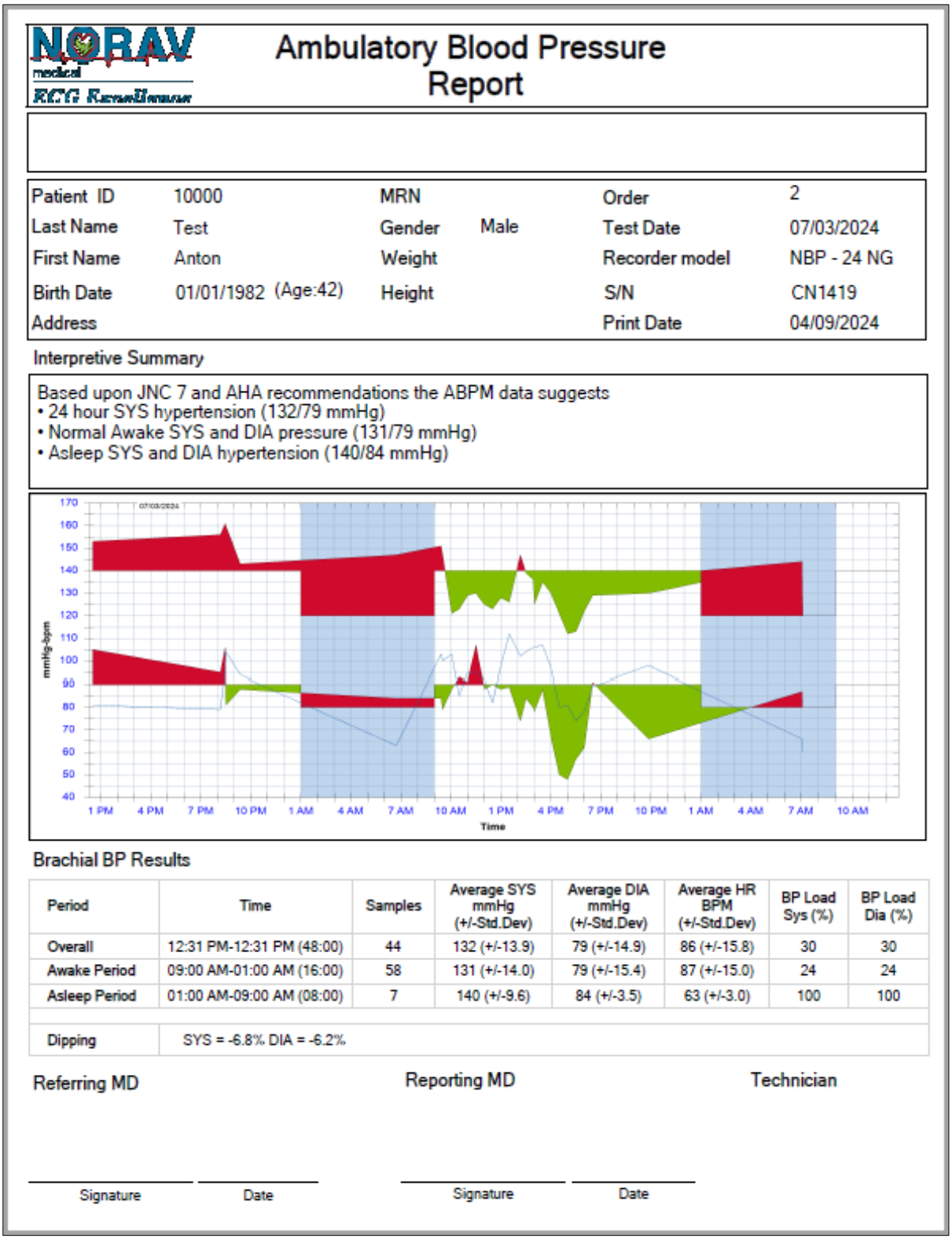


Figure 195: ABPM Report Preview

To view the report, click the View Report button.

The **ABPM Report** is displayed.



NORAV medical ECG Recording

Ambulatory Blood Pressure Report

Patient ID	10000	MRN		Order	2
Last Name	Test	Gender	Male	Test Date	07/03/2024
First Name	Anton	Weight		Recorder model	NBP - 24 NG
Birth Date	01/01/1982 (Age:42)	Height		S/N	CN1419
Address				Print Date	04/09/2024

Interpretive Summary

Based upon JNC 7 and AHA recommendations the ABPM data suggests
- 24 hour SYS hypertension (132/79 mmHg)
- Normal Awake SYS and DIA pressure (131/79 mmHg)
- Asleep SYS and DIA hypertension (140/84 mmHg)

Brachial BP Results

Period	Time	Samples	Average SYS mmHg (+/-Std.Dev)	Average DIA mmHg (+/-Std.Dev)	Average HR BPM (+/-Std.Dev)	BP Load Sys (%)	BP Load Dia (%)
Overall	12:31 PM-12:31 PM (48:00)	44	132 (+/-13.9)	79 (+/-14.9)	86 (+/-15.8)	30	30
Awake Period	09:00 AM-01:00 AM (16:00)	58	131 (+/-14.0)	79 (+/-15.4)	87 (+/-15.0)	24	24
Asleep Period	01:00 AM-09:00 AM (08:00)	7	140 (+/-9.6)	84 (+/-3.5)	63 (+/-3.0)	100	100
Dipping	SYS = -6.8% DIA = -6.2%						

Referring MD — Reporting MD — Technician

Signature — Date — Signature — Date

Figure 196: ABPM Report

To print the report, click the Print button.

To export the BP measurements table to Excel file, click the Export button, which prompts to location on your PC for saving the Excel file.

To customize the report, click the Customized Report button.

The **Customization** Dialog Box is displayed.

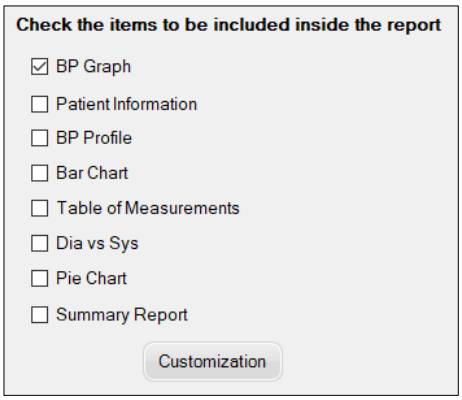


Figure 197: Customization Dialog Box

Select the items for inclusion in the report from the drop-down list, and click Customization

To send the report by email, click the Send Report button, which opens a message in MS Outlook with the report PDF ready to be sent.

To save the report PDF, click the Save Report button, which prompts to location on your PC for saving the PDF file.

Finally, click the Back button to return to the **Patient List** main screen.

Working with the NBP-24 NG ABPM Recorder

Preparing NBP-24 NG Recorder for New ABPM Test

1. Make sure the NBP-24 NG recorder is connected to the PC USB port.

Select the patient from the **Patients Screen**, click the New Test button, and then select the NBP24-NG test type.

The **Patient Details** Dialog Box is displayed.

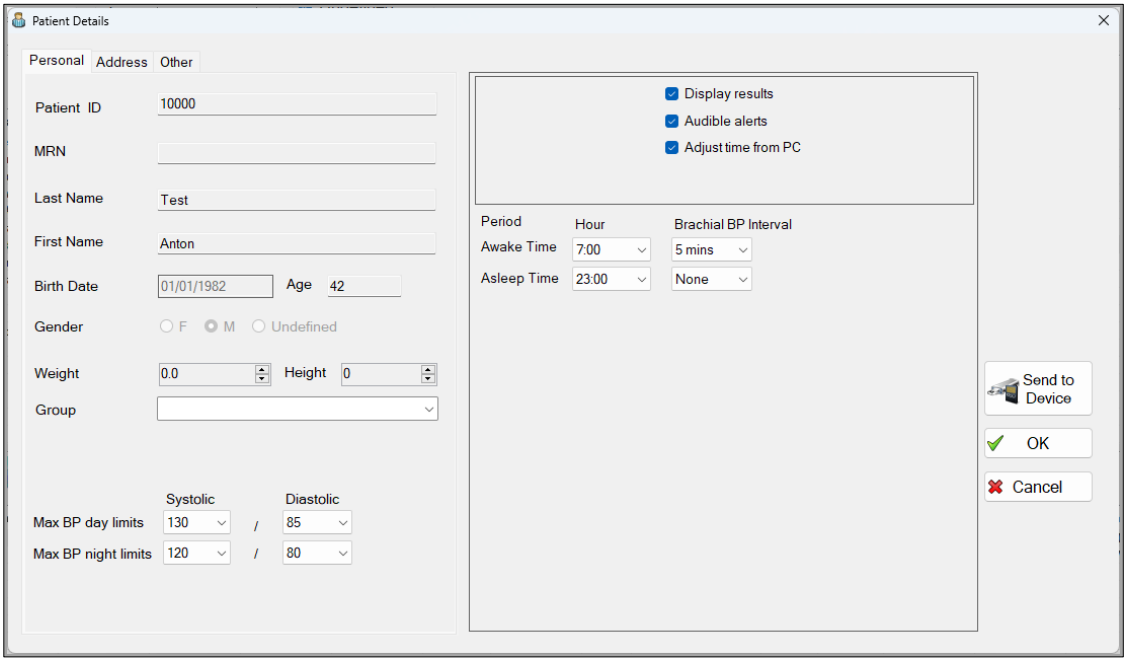


Figure 198: Patient Details Dialog Box

Validate the patient details, configure the ABPM protocol settings, and then click the Send to Device button.

Disconnect the NBP-24 NG recorder from the PC.

Downloading ABPM Recording from NBP-24 NG Recorder

See Section Downloading ABPM Recording from NBP One Recorder.

Reviewing ABPM Recording

Note

Reviewing ABPM recording is identical for NBP One and NBP-24 NG.

See Section Reviewing ABPM Recording in NEMS-A.

Working with the HRV Application

Select the patient from the **Patients Screen**, click the New Test button, and then select the Hrv test type.

The **Patient Data** Dialog Box is displayed.

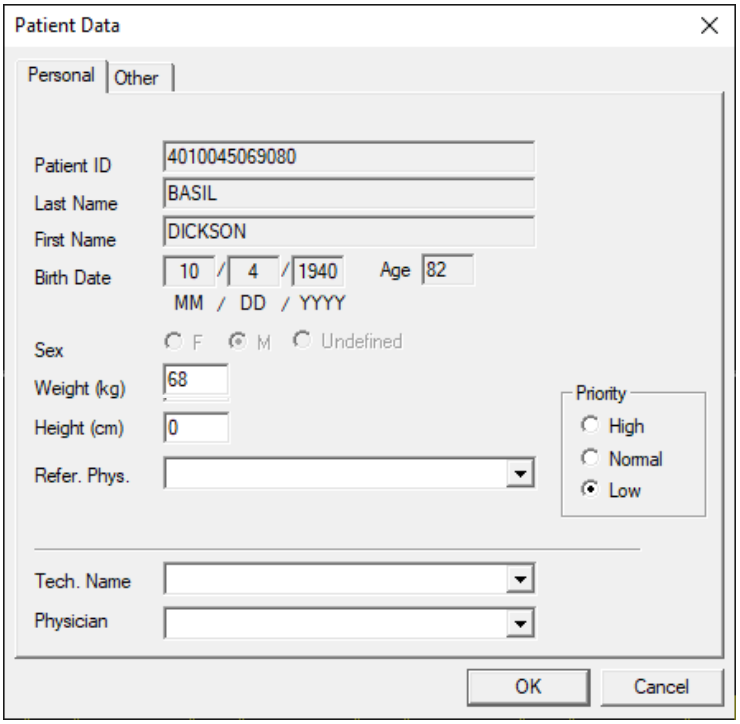


Figure 199: Patient Data Dialog Box

Validate the patient details and click OK.

For detailed description, refer to the PC-ECG IFU – Heart Rate Variability (HRV) Chapter.

Working with the Late Potential Application

1. Select the patient from the Patients screen, click the New Test button, and then select the Lp test type.

   The **Patient Data** Dialog Box is displayed.

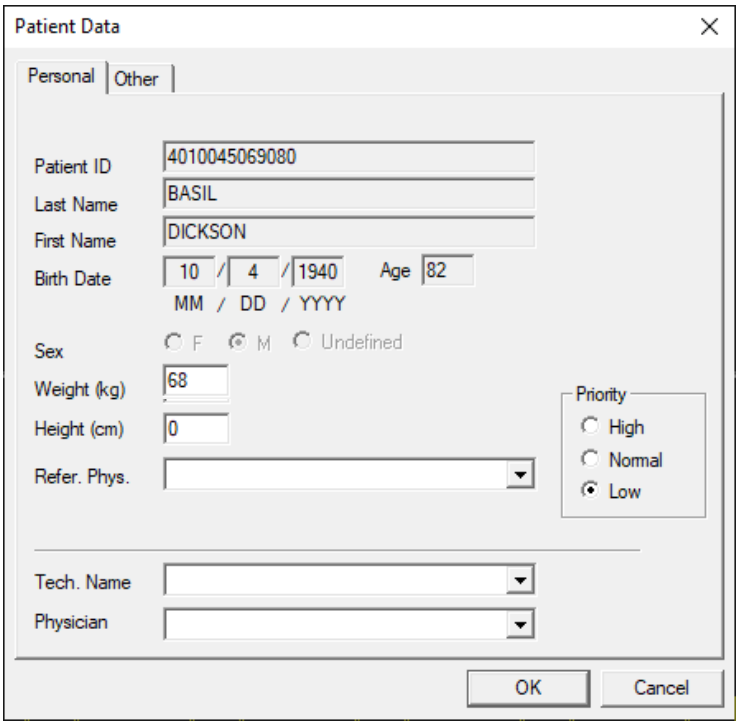


Figure 200: Patient Data Dialog Box

Validate the patient details and click OK.

For detailed description, refer to the PC-ECG IFU – Late Potential Signal Averaging Chapter.

Working with the ECG Monitoring Application

1. Select the patient from the **Patients Screen**, click the New Test button, and then select the Monitoring test type.

   The **Patient Data** Dialog Box is displayed.

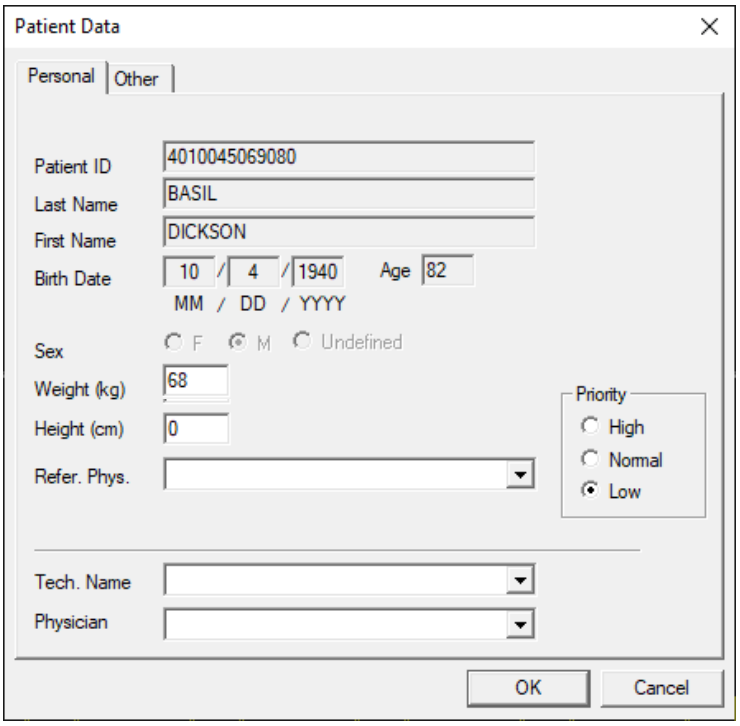


Figure 201: Patient Data Dialog Box

Validate the patient details and click OK.

For detailed description, refer to the PC-ECG IFU – Monitoring ECG Chapter.

Working with the NSpiro™ Application

For detailed description, refer to the NSpiro™ Quick Guide and the NSpiro™ Software IFU.

Before working with the NSpiro™ device, install the NSpiro™ software on your PC (see the NSpiro™ Software IFU Section 1.3 – Installing the Software).

After the NSpiro™ Software is installed, continue in NEMS-A as follows.

1. Click  on the **Toolbar**.

   The **Setup** Dialog Box is displayed.

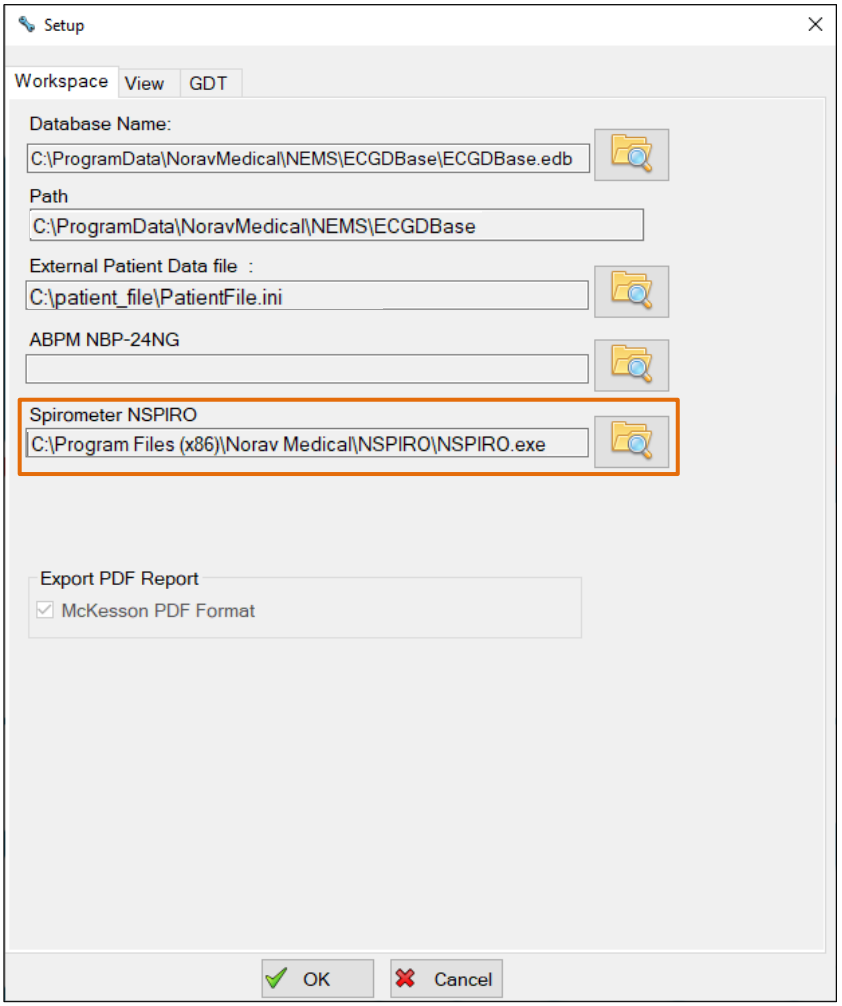
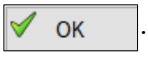
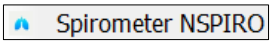


Figure 202: Setup Dialog Box

To open the NSpiro™ software, click  , then browse and select the **NSPIRO.exe** file on your PC.

Click  .

Select the patient from the **Patients Screen**, click the  button, and then select the  test type.

The **NSpiro™ Software** is opened, displaying the **NSpiro™ Main Screen**.

Calibrate the device (see the NSpiro™ Quick Guide Chapter 4 – Calibrating the Device).

Enter patient details (see the NSpiro™ Quick Guide Chapter 5 – Enter Patient Details).

Perform the test (see the NSpiro™ Quick Guide Chapter 6 – Perform a Test).

To review the test:

Click the Records tab and select (highlight) a SPIRO recording.

The **SPIRO Recording Selection for Review Screen** is displayed.

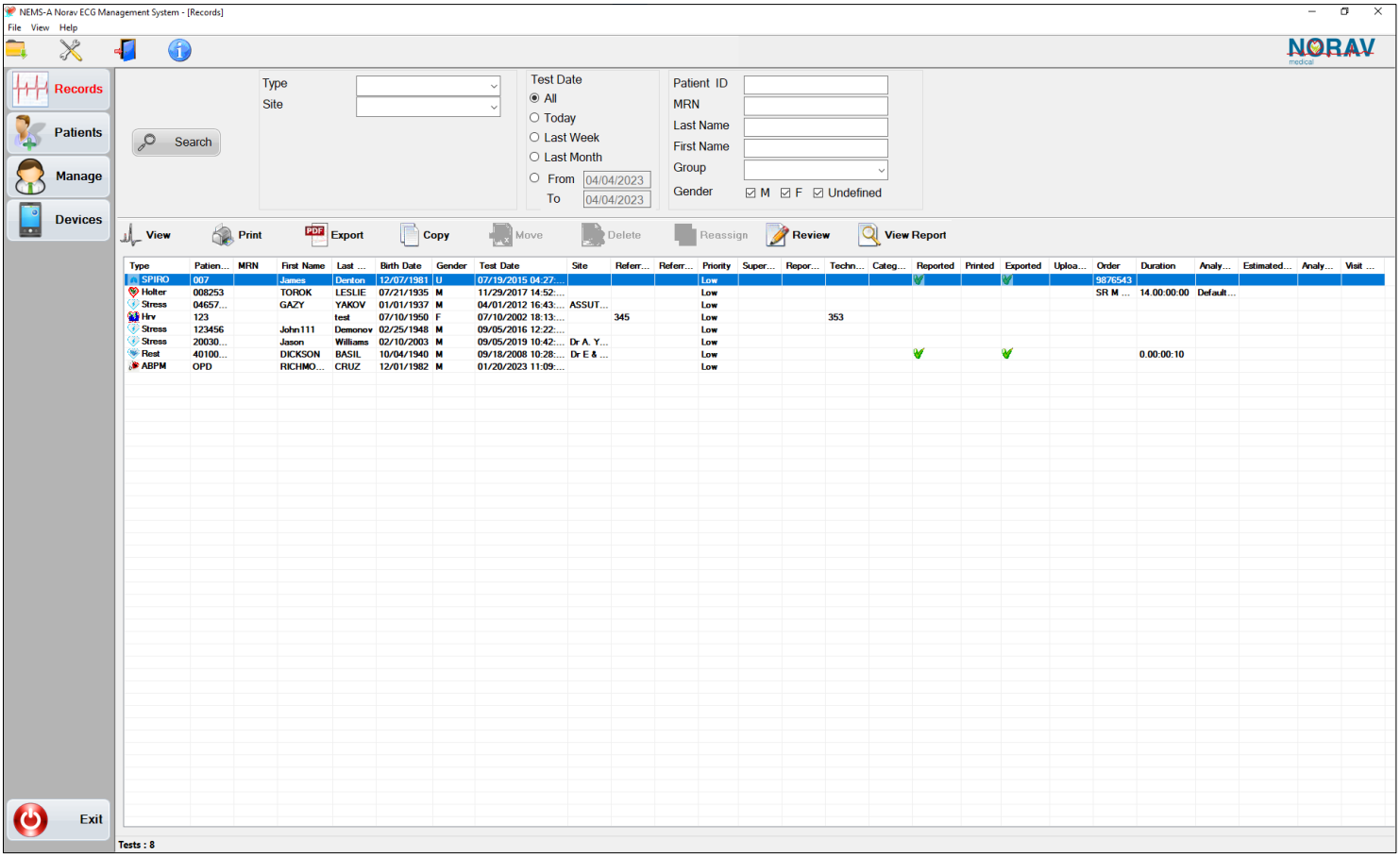


Figure 203: SPIRO Recording Selection for Review

Click the Review button.

The **NSpiro™ Main Screen** is displayed.

Review the test (see the NSpiro™ Quick Guide Chapter 7 – Review Tests).

Print the report (see the NSpiro™ Quick Guide Chapter 8 – Print Final Report).

Troubleshooting

Problem	Cause	Corrective Action
When attempting to perform an action, an onscreen error message appears indicating there is a failure in connecting database.	Network connection.	If you are working on the network, consult your system administrator and then examine the network connection.
Encrypted NBP-24 NG devices stopped connecting with PC during work.		Uninstall the COM port, used for connection with device.
Device is not connected… message is displayed when preparing the NBP-24 NG device or downloading from it in Windows 11.	Prolific PL2303TA USB to Serial driver is not supported by Windows 11 or later.	Open Device Manager, where the **…not supported…** message is displayed and update the driver or reinstall it. A new driver can be easily found on the Internet (or provided by Norav). The action may be required for each new used USB port or USB cable of the NBP-24 NG device.
How to check HASP when license-related issues occur: (software key not found, missing some permissions).	HASP is connected to PC or server, but the application cannot be opened or used correctly.	The first-line test for both HASP and NetHASP issues is checking the **http://localhost:1947** address via Internet browser. Here you can immediately see all HASP and NetHASP keys visible on a current PC locally and in network. The Norav dongle VendorID=47559. To check the licenses on Norav HASP/NetHASP dongles, we use the HaspLicenseRadar tool. Use is simple: Run the tool on the computer where the HASP/NetHASP key is connected to USB. This shows the list of licenses on the dongle. Ask Support team for the tool, if needed.

Appendix – Interfacing with Information Systems

There are several ways to exchange information between NEMS-A and Hospital Information System (HIS). These are described below.

Demographic Data

HIS Preparing Patient Demographic Data for NEMS

This uses a text file named PatientFile.ini. The file location is defined in NEMS-A setup.

The file consists of patient data segments. Maximum length is 999 patients.

PatientFile.ini Format

Field Name	Type	Max. Length	Format	Comments
[PatientDataXXX**]**	Header	Fixed	[PatientData001] to [PatientData999]	Segment counter
ID	Alphanumeric	30	Cannot contain \ / ? * " < > | _ symbols	ID number (MRN)
LastName	Alphanumeric	30	Cannot contain \ / ? * " < > | _ symbols	
FirstName	Alphanumeric	30	Cannot contain \ / ? * " < > | _ symbols	
BirthDay	Number	2	01 to 31 or 1 to 31	
BirthMonth	Number	2	01 to 12 or 1 to 12	
BirthYear	Number	4	YYYY	
Sex	Number	1	0 – Female, 1 – Male, 2 – Undefined	
Weight	Number	3	0 to 500 (integer)	kilograms
Height	Number	3	0 to 300 (integer)	centimeters
Address	String	256	Any text	
Phone1	String	15	Any text	
Phone2	String	15	Any text	
Fax	String	15	Any text	
E-Mail	String	30	Any text	
Medications	String	256	Any text	
Other	String	256	Any text	Any textual data
TechName	String	30	Cannot contain \ / ? * " < > | _ symbols	Performing person
PhysName	String	30	Cannot contain \ / ? * " < > | _ symbols	Attending physician
IDR	Alphanumeric	30	Cannot contain \ / ? * " < > | _ symbols	Accession number
Case_ID	Alphanumeric	30	Cannot contain \ / ? * " < > | _ symbols	Visit number
Employee_Resp	String	30	Any text	
Type	String	30	ECG, Stress, Rest, Holter, ABPM, SPIRO	Examination type
ScheduledDate	Number	12	YYYYMMDDHHMM	Scheduled date
Status	Number	1	0 – scheduled, 1 – in process, 2 – completed	Examination status
Location	String	30	Any text	Examination office
ReferPhys	String	30	Any text	Reference physician
AlternateID	String	30	Cannot contain \ / ? * " < > | _ symbols	Alternate ID number

At least one of the **ID**, **LastName**, or **FirstName** fields must be completed.

When all these fields are blank, the section of this patient is ignored.

Example

[PatientData002]
ID=10002
LastName=Johnson
FirstName=Mary
BirthDay=30
BirthMonth=11
BirthYear=1948
Sex=1
Weight=69
Height=171
Address=25 Wightman Street, San Diego, USA
Phone1=858-6577000
Phone2=858-6577001
Fax=858-6576000
E-Mail=b@a.com
Medications=aspirin, analgen
Other=OtherDetail-2
TechName=Technician@21
PhysName=Physician@21
IDR=1243531
Case_Id=Case#2
Employee_Resp=Employee_Resp#21
Type=Stress
ScheduledDate=201510161440
Status=1
Location=UC San Diego Medical Center

Importing ECG Recordings with Patient Data Validation

When importing ECG recordings containing only the patient ID or the Order Number, NEMS-A can retrieve the patient's name by obtaining it from the database.

To setup the ECG recordings import with patient data validation, edit the Settings.xml configuration file as follows:

1. Set the <ValidatePatient enabled="TRUE">

Set the validation key field:

To check patient data by ID, set:
<CheckID>TRUE</CheckID>
<CheckOrderID>FALSE</CheckOrderID>

Importing PDF Reports

NEMS-A can accept PDF reports created by external systems. The patient and test information should be included in the PDF filename.

External PDF reports should be received to the NEMS-A database Import folder.

The import folder path is described in the <InboxFileDirectory> parameter of the Settings.xml configuration file.

Three filename formats are available for importing PDF reports.

PDF Report Filename Format #1

Filename format: **ORDER_ID_LAST_FIRST_DOB_DATE_TIME_TYPE.PDF**

Where:

ORDER	Examination identifier (order number, accession number, or other)
ID	Patient ID number
LAST	Patient last name
FIRST	Patient first name
DOB	Patient birth date in format DD-MM-YYYY
DATE	Examination date in format DD.MM.YYYY
TIME	Examination hour in format HH~MM~SS
TYPE	Can be REST, STRESS, HOLTER, ABPM, or SPIRO

Example:

0001_12345_Vivaldi_Antonio_04-03-1978_15.07.2015_12~15~21_STRESS.PDF

PDF Report Filename Format #2

Filename format: **ORDER_ID_FIRST_LAST_DOB_SEX_DATETIME_TYPE.PDF**

Where:

ORDER	Examination identifier (order number, accession number, or other)
ID	Patient ID number
FIRST	Patient first name
LAST	Patient last name
DOB	Patient birth date in format DD-MM-YYYY
SEX	Patient gender: M – male, F – female, U – undefined
DATETIME	Examination date in format YYYYMMDDHHMMSS
TYPE	Can be REST, STRESS, HOLTER, ABPM, or SPIRO

Example:

000987_123_Mary_O'Hara_19691129_F_20131008094317_HOLTER.PDF

PDF Report Filename Format #3 (ABPM Reports only)

Filename format: **ID_LAST_FIRST_DOB_DATE_TIME_TYPE.PDF**

Where:

ID	Patient ID number
LAST	Patient last name
FIRST	Patient first name
DOB	Patient birth date in format DD-MM-YYYY
DATE	Examination date in format YYYY-MM-DD
TIME	Examination hour in format HH-MM
TYPE	Can be 24hABPM, OfficeBP, HomeBP, or 24hPWA

Example:

999999_Doe_John_1945-08-02_2007-05-29_12-18_24hABPM.pdf

Exporting PDF Reports

NEMS-A can export the PDF reports to be accepted by external systems. The patient and test information are included in the PDF filename.

The export folder path is described by <**OutboxFileDirectory**> parameter of Settings.xml configuration file.

PDF reports export filename format is according to Format #2 (see Section PDF Report Filename Format #2).

GDT Interface

GDT interface enables NEMS-A to communicate with EMR programs. The patient is always selected in the EMR program. NEMS-A should be called after the patient's electronic recording file in the EMR program is selected. Patient data management is done in the EMR program, whereas medical signals (ECG, ABPM, spirometry data, etc.) are handled in NEMS-A.

New procedures are created via NEMS-A. Existing procedures can be edited via NEMS-A. Upon completion of a new procedure or after review of the existing procedure, the EMR program adopts the most important data of all new and edited procedures.

Calling NEMS-A from EMR via GDT

Adjust the EMR configuration to call the NEMS-A Client with **/GDT** command line switch.

Example: **C:\Program Files (x86)\Norav Medical\NEMS\EMSApplication.exe /GDT**

Functionality

1. EMR prepares a GDT command file and then places it in the GDT Inbound folder.

Launch the NEMS-A Client application with /GDT command line switch.

NEMS-A starts and performs the procedure defined in the GDT command file.

After the procedure is completed the GDT report is generated in the GDT Outbound folder.

Exit the NEMS-A Client application, which can be done automatically or by operator.

Opening Patient Data in NEMS-A Interface via GDT

1. Initiate the EMR program and select a patient.

Perform **Open Patient History** whatever command in the EMR program interface.

NEMS-A starts with the selected patient record or automatically creates a new patient record.

Start new procedure or review existing recordings in appropriate software application.

When the action is completed, the software application sends results to the EMR.

The EMR program automatically adopts the updated data.

Performing New Test via GDT

1. Initiate the EMR program and select a patient.

Start the desired procedure in the EMR interface that initiates the NEMS-A application.

NEMS-A displays the initiated procedure details to be validated by the user.

The user must confirm the selected procedure or select another procedure type for the patient.

Upon confirmation of the procedure type, NEMS-A starts the appropriate software application.

Perform the procedure (acquire ECG, spirometry test, prepare ABPM recorder, etc.).

When the procedure is completed, the software application sends results to the EMR.

The EMR program automatically adopts the new results.

Displaying Existing Procedure via GDT

1. Initiate the EMR program, select a patient, and then select the existing procedure from the list.

Perform **Review** or **Open** whatever command in the EMR interface.

This activates NEMS-A that displays the test details to be validated by the user.

Open the selected record, review, and then save the record.

When review is completed, the software application sends results to the EMR.

The EMR program automatically adopts the updated review report.

Document History

Version	Date	Updates	Changed by
1.0.0.0		IFU created	
2.7.5.0 Rev. 02	05.07.2023	Updated ABPM Reports and Graphs by removing all irrelevant measurements, unselected from the beginning of the test. Added functionality to Updated PDF Report for Rest and Stress tests after reviewing the records (adding Remarks or Conclusion)	Alex K.
2.7.5.0 Rev. 03	21.12.2023	Images updates to reflect the UI changes within certain screens.	Anton B.
2.7.6.0	28.12.2023	Added Multiple Report Date Format (Europe, USA), Header alignment to the Setup menu . Added Referring Physician, Reporting Physician and Technician drop-downs to the Review screen for ABPM (and to the reports) . Added support for the new NH301 v4.0.0 Holter format (HL5)	Anton B.
2.7.7.0	03.09.2024	All changes are related to the Review ABPM screen: • Introduced the Interpretative summary, also within ABPM report. • Changed "Average" to "JNC7/AHA" thresholds + Custom option for the thresholds. • New layout for ABPM reports + Header centering Added new parameter - Morning BP Surge for ABPM Test Review screen and PDF Report	Anton B.
2.7.7.1	05.11.2024	• NR-314-P recorder support • Prepare device with existing study warning notification • Download from recorder (clear recorder memory notification) • NEMS ABPM Report front page changes (mainly header and footer areas)	Anton B.
2.7.8.0	30.04.2025	General Information section updated; Document reference information format updated; Preparing Holter Recorder for New Patient section updated (Check ECG section introduced).	Anton B.
2.7.8.0 Rev. 02	06.08.2025	General Information section update.	Anton B.