

PedCath[®]

Welcome

PedCath was developed in the winter of 1994 at the request of Dr. Allen Everett and others at the University of Virginia Health Sciences Center. While initially conceived 14 years earlier and attempted on one of the original Apple II computers, the processing speed and graphics power available today have enabled us to develop a powerful tool for pediatric cath reporting, used in the majority of congenital cath labs worldwide.

PedCath has been used continuously at the University of Virginia since January 1, 1995. It combines several important features:

- 1) An easy method of recording data specific to the pediatric catheterization laboratory. The program works in any cath lab, on any PC running Windows, and provides a standard set of hemodynamic calculations.
- 2) The definitive atlas of congenital defects. We are proud to be licensed to distribute the *Mullins and Mayer Atlas* for electronic cath reporting. We have expanded the atlas with many new diagrams available for download.
- 3) A visual database of all patients having undergone cardiac catheterization.
- 4) A powerful, built-in drawing program for modifying diagrams to show patient-specific anatomy. The drawing program makes it easy to represent the patient's anatomy accurately, and to add hemodynamic values and other annotations.
- 5) A data structure designed so that statistical summaries may be quickly and easily compiled. **PedCath** includes software for reporting patient groups by diagnosis, age, cath date or physician.

Acknowledgments

Dr. Allen Everett has given freely of his time to help develop **PedCath**. He has also provided invaluable assistance as editor of the *Illustrated Field Guide to Congenital Heart Disease and Repair*, *Illustrated Field Guide to Adult Congenital Heart Disease*, the **PedHeart Resource** (www.HeartPassport.com), and the **PedHeart Community Web** (www.Congenital.org). Without his generous help, none of these would have been possible.

At the University of Virginia, Scott Lim MD, Paul Matherne MD, and Howard Gutgesell MD have aided in the design of **PedCath** and provided technical guidance. Drs. Felice Heller, William Hammill and Naomi Gauthier provided live testing and feedback during the initial testing phase.

PedCath was tested at many institutions before you received this copy.

In particular, we wish to thank:

- Dr. Donald Hagler at the Mayo Clinic
- Dr. Masato Takahashi at Children's Hospital LA
- Dr. James Moller at the University of Minnesota
- Dr. Mark Alexander at Boston Children's Hospital
- Dr. Gil Wernovsky and Dr. Jonathan Rome at Children's Hospital of Philadelphia
- Dr. Ed Overholt at Oklahoma Children's Hospital
- Dr. Michael R. Nihill, Dr. Charles E. Mullins and Dr. Ronald G. Grifka at Texas Children's Hospital

Dr. Lee Benson at The Hospital for Sick Children (Toronto) has guided development of the optional hierarchical diagnostic codes and many other features that have been added to **PedCath** over the years.

We would also like to thank Dr. Charles E. Mullins and Dr. Timothy J. Bricker for their assistance in licensing the *Mullins & Mayer Atlas*[®].

Thanks to all

Overview of Features

Over the past two decades, **PedCath** has become the most widely used software for storing and reporting data from congenital cardiac catheterization procedures. While it remains simple enough to run on virtually any PC, the program is designed with the needs of physicians and other practitioners in mind. It is intended to save valuable time, while improving the accuracy, thoroughness and appearance of cath reports.

With **PedCath**, data entry is designed to be quick and easy. As you enter the results of a catheterization procedure, the program automatically makes standard calculations and displays the results on the screen. A calculation override feature is provided as well, allowing you complete control over every calculated value.

You may select diagnosis and intervention codes, to be stored as part of each cath record. Whether you are using the standard diagnostic code set or an optional one, you can easily select codes and then rank them in order of importance. Optional code sets are also available; current choices include the widely used codes from Boston Children's Hospital, Toronto Hospital for Sick Children, Texas Children's Hospital and the European Paediatric Cardiac Coding System. IMPACT users have access to the STS compatible IMPACT Dx codes.

Perhaps the most unusual feature of **PedCath** is its ability to generate, store, retrieve and print high-quality anatomical diagrams. You may select up to three diagrams for each cath. If a patient's cath record includes more than one set of hemodynamic data, individual diagrams may be specifically associated with one or more data sets.

After selecting an appropriate diagram, you may modify it to match the patient's anatomy by using the special, built-in drawing program. The drawing tools allow you to add text to the diagram or to insert arrows indicating the catheter course. Interventional devices are easily illustrated. Cath data can be automatically embedded or manually inserted from a table directly into the diagram. In addition, you may save the modified diagram as a template, to be used as a starting place when recording future cath data for the same patient.

The printed cath report contains all hemodynamic data, as well as hospital and patient information, the patient's anatomical diagram, and standard calculations. The diagram and other data can be exported to disk in several standard formats, to be used by your institution's internal information systems or directly emailed to other doctors.

The document manager allows you to generate, store and print documents with each cath record, and the image manager allows you to add angio still frames, waveforms, or any other image to your cath report.

***We are always looking for ways to improve your software and enhance its usability.
Please do not hesitate to get in touch with your comments and suggestions.***

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Installation

Overview and Technical Notes

PedCath is a Congenital Cardiac Catheterization Reporting Tool. It was designed to allow user generated comprehensive reports following a catheterization procedure in order to record the actions performed, findings made and to communicate this information with other medical personnel. Users may recall any cath report saved since the first cath was entered.

The **PedCath** database structure begins at the patient level. Each patient record can be associated with an unlimited number of cath records. Each cath record can be associated with up to three diagrams, eight sets of hemodynamic data, comments, diagnostic codes, billing codes, images and documents. In addition to being saved in the database, the report can be printed or saved as a PDF, HTML or ASCII file. Optional XML and HL7 file formats as well as FTP protocols are available.

PedCath is a workstation based (“thick-client”) application. The application is installed on each local machine from which you wish to access the **PedCath** data. **PedCath** is licensed as either single-user or multi-user. This refers to the number of concurrent users that may access **PedCath** at any one time. The data is in relational dBase format and each table is a unique file (*.dbf). Most tables have corresponding index files (*.nsx) and some have one or more memo files (*.smt). In addition to the database files, there are diagram files (*.pcx), image files (various image formats) and report files (various document formats). These files may reside in a directory located anywhere on the network where the local workstations have read/write privileges, or on a stand-alone PC. The amount of data required by each cath depends on the number of documents, diagrams, and images included in the cath report and, to a lesser extent, the amount of data entered by the user. Typically, each additional cath report is smaller than 500KB (excluding Image Manager items).

PedCath Hardware Requirements

Operating System

PedCath will operate on any 32-bit or 64-bit version of Windows, which includes Windows 95, 98, 2000, Windows NT 4.0, Windows XP, and Windows 7/8/10/11.

Video

PedCath is designed to work best at a screen resolution of 1024x768 or more. Lower screen resolutions are not supported.

Hardware

Minimum specifications: will always vary with the computer configuration, network, and other applications that may be running concurrently.

Recommended specification: 1 GHz or better processor (32-bit (x86) or 64-bit (x64)), Windows XP (512MB RAM) or Windows 7/8/10/11 (1GB RAM).

* **PedCath** does not support Japanese, Chinese or Cyrillic character sets under Windows 98.

Installing **PedCath**

PedCath requires separate installation of program and data files.

Updating Data Files

If you have been using **PedCath**³ or PedCath7, your existing data will need to be converted to the current format. Use the instructions provided with your installation CD if you are upgrading existing data.

Installing Data Files for New Users

Empty **PedCath** data files are provided for new users on the installation CD in the “BlankData” folder. If you are going to use the program on more than one computer, the data will need to be accessible to each workstation. This usually means setting up a data folder on a server.

New users install the empty **PedCath data files by opening the “BlankData” folder on the CD-ROM and double-clicking PC7_Net.exe. This will create a folder called “PC7_NET.”**

The default location for the PC7_NET folder will be on the C: drive, which is correct for installation on a single computer. For network installations, this folder will need to be installed on the network server. For example, if the network drive is mapped as “S:”, the location for installation of the PC7_NET directory should be changed from C: to S:.

The “PC7_Net” folder contains about 130MB of data when first installed. Subsequent cath reports require relatively little hard disk space. Each completed cath report typically adds 250K to 500K. If you are assigning disk space to the **PedCath** data folder, 100Mb should be sufficient to store well more than one hundred cath reports.

Each workstation running the program will need to access **PedCath**'s common data files. These files, the diagrammatic atlas and other shared files are typically placed on a server. Each user must have read-write privileges to this “PC7_Net” folder on the server.

If you plan to install **PedCath** on only one computer, the data files can be placed on your local hard disk. Data can be moved to a server later, if you add additional computers.

Installing **PedCath** Program Files (local workstations)

You will need about 100 MB of space on each workstation for the software. This amount is in addition to what is required in the network folder.

To install **PedCath** on an individual workstation, you will need to run the install program. We provide a CD-ROM that contains the installation program. If the computer supports autorun, the installation program will begin when the CD is inserted.

In addition, we can provide a single-file executable that will install the program on the local machine when run from that machine. Some hospitals have placed this program in a subdirectory of the **PedCath** network folder and emailed links to individual users. Users click the link and the program is installed on their computer. Some anti-virus software will interfere with this method.

Installing **PedCath** Updates (local workstations)

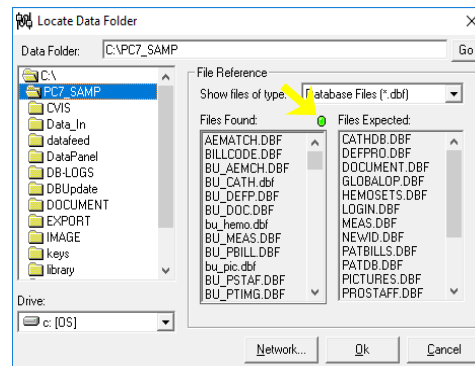
PedCath updates are available to all users with current support on the web at www.PedCath.com. Network administrators may choose to allow users to update directly from the web, or distribute *.P7U update packets without users directly accessing the internet.

Running **PedCath** for the First Time

Locating the data folder

The first time you run **PedCath**, you will be asked to locate the network data folder. Click OK, then select the location of the “PC7_Net” folder. If you do not know the location of the data directory, ask your network administrator.

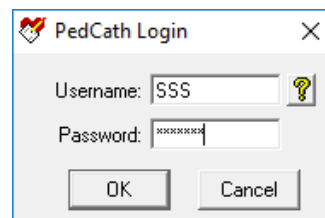
Notice the red light next to the ‘file found’ box. **PedCath** will check the directory you select. When the light turns green (as shown by yellow arrow, opposite), you know the proper data files have been found.



First Login

After the **PedCath** installation is complete and the data path is selected, log in as an administrator with the initials **SSS**.

The **SSS** password will be **PedCath8!**



Adding **PedCath** users

You will need to add personnel before adding new cath.

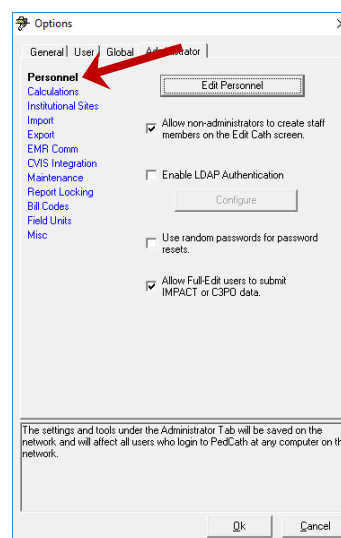
From the menu bar, select Tools-Options-Administrator-Personnel and click the **Edit Personnel** button.

(Note: you can also edit personnel by choosing View-Personnel from the menu bar)

Assuming you will have administrative privileges, click the

Add New button and enter your own information in the screen provided.

Make a note of the initials **PedCath** is going to use for your log in. You may change these if desired. Click OK and make sure to give yourself **Administrative** privileges. Exit and close the program.



Initial Passwords

PedCath is now set up to run with two administrative users, you and the original **SSS** administrator.

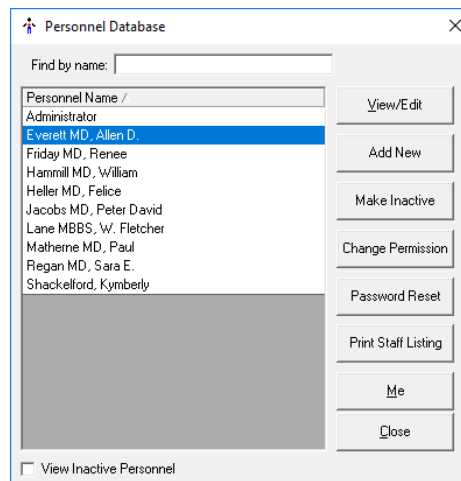
Log in to the program once more, but this time use your own initials.

Initial Password for all new users will be **Taussig1!**

After logging in the first time, the password must be changed.

Removing **PedCath** users

After logging in with your own initials and changing your password, go once again to the tools menu and select “Options...” There, select the “Administrator” tab and then select “Personnel” from the list on the left and click the “Edit Personnel” button. To remove a personnel member, select their name within the list and click the **Make Inactive** button. If the user isn’t referenced on any cath reports you will be able to permanently remove the record, otherwise the record will become disabled and hidden from the list.



Prior to Using **PedCath** for Cath Reporting

PedCath is initially configured with one administrative user. Additional personnel may be added by anyone with administrative privileges. Users with Full-Edit privileges may also add users with No Access, such as referring physicians. If you are entering a large number of personnel at one time, note that only the display, initials, and permissions settings are required for each user and other information can be entered at a later time.

Note: After setting up your users and at least one administrator, it is a good idea to remove the SSS Administrator from the active list.

Other Administrative Options

It is important for the cath lab director to review the *Options* settings. There are several clinical and administrative settings that should be confirmed before entering actual case data.

PedCath Technical Overview

Introduction

PedCath is a "networkable" desktop application. You must install **PedCath** on each computer on which you want to use it, and each running instance of **PedCath** must have read/write access to the Data Folder. The Data Folder contains the **PedCath** database files and other files (such as diagrams, images, and documents) that are linked to cath records. The Data Folder may also contain export and import files, **PedCath** update files, patient and stock diagram templates, document templates and various configuration files.

Requirements

Local Computer

Minimum Specifications

Pentium III 500 MHz or equivalent processor
 128 MB RAM (or minimum required by operating system).
 Windows 98, NT 4.0, 2000, XP or Windows 7/8/10/11 operating system
 64 MB video adapter memory, 1024 x 768 resolution
 100 MB available hard disk space

Recommended Specifications

1 GHz or faster processor (32-bit (x86) or 64-bit (x64))
 512 MB RAM (XP), 1 gigabyte (GB) RAM (Win 7/8/10/11)
 XP Professional SP3 or Windows 7/8/10/11 operating system
 128 MB video adapter memory, 1024 x 768 resolution
 200 MB available hard disk space

File Permissions

Each instance of **PedCath** must have read/write access to the Local Program Folder (see Appendix A). Each instance must also have read/write permissions to the Data Folder and, if you have a Direct Data Import Utility, to the Import Folder. This means that each **PedCath** user must have read/write permission to all these folders on each computer on which he/she uses **PedCath**.

Registry Permissions

Each instance of **PedCath** must also have read/write permission to the following Windows registry keys:

- HKEY_CURRENT_USER\Software\PedCath
- HKEY_LOCAL_MACHINE\Software\PedCath

Data Folder

The **PedCath** data folder is nothing more than a directory with subdirectories and files in it. **PedCath** does not use a database server. **PedCath** uses standard Windows file sharing to allow multiple installations to access the same data. Therefore, the data folder can be anywhere on the network, as long as each instance of **PedCath** has read/write access to it.

When **PedCath** is first installed, the Data Folder will be about 130MB in size. The size each record can vary widely, depending on the number and size of diagrams, images, documents, import files and export files. A typical record is less than 100 KB, and a typical institution will add fewer than 500 records per year. If storage space is a concern, you should check the size of the Data Folder periodically for the first month or two after installation to get an idea of how quickly it grows in size.

Installing PedCath

PedCath is a desktop application and therefore you must manually install it on every computer on which you want it to run. There are two methods for installing **PedCath**: from the CD or from the network.

Installing from the CD

To install from the CD simply log in to the computer and insert the CD. The setup program should start automatically. If the system does not support autorun, then navigate to the CD and manually start **setup.exe**.

Installing with a Single Exe Installer

If you were sent an installation email from Scientific Software, you would have been provided a download to a PedCath Windows installer file (named similarly to **PC8xx_setup.exe**). If you instead have the installation CD you can find this file in the **Support\SingleEx** folder. Copy this file to a place on the network that you'll be able to access from each computer where you want to install PedCath. Someone must still run this file on each computer, but this saves you having to move the CD around and enables some other options. At institutions where users are able to install software, you can simply send a link via email. Or, if you have remote desktop capabilities, this method will allow you to install **PedCath** from a remote computer. An MSI file is also available.

Updating PedCath

Installing updates is performed similarly to the initial installation. You would obtain a full installer of the version you'd like to upgrade to from the PedCath.com web site, and run it on each workstation. When launched, it will prompt you to uninstall the previous version before installing the new version.

Alternatively, updates can be installed via the **PedCath** Update Wizard, which is installed in the Local Program Folder (see Appendix A) when you install the main **PedCath** application. Update Wizard uses **PedCath** update files (*.p7u) to perform the update. The Update Wizard can automatically download and use the latest update file from the Web, or it can use a file on the local machine or the network. There is also a feature in the Administrative Console called the Institutional-wide upgrade that will instruct workstations to apply a particular update file when launched. Be aware that users do need elevated rights to apply updates via Update Wizard, whether it be when launching it directly or through the Institutional-wide upgrade.

There are major and minor releases of **PedCath**. A major release will have a larger second number in the version number string: version 8.2.x is the next major release after version 8.1.x. All computers in the hospital must be running the same major release. So, for example, if all computers are running version 8.0.5 and someone updates one computer to version 8.2.2, then all the other instances of **PedCath** will be forced to update before they can access the data. Minor updates are generally optional, so someone may update an instance of **PedCath** 8.2.0 to version 8.2.1 without affecting any other instance of **PedCath** in any way. However some minor updates do require a database upgrade, in which case all users would need to be running the same version. The update web site will specify if there is a database update or if otherwise all users would be required to run the latest version. We do generally recommend that all users run the same version.

An administrative login to **PedCath** is required to run a database upgrade, to help prevent accidental upgrades.

Users and Security

PedCath requires all users to log in with a username and password. There are several different permission levels (see Appendix B). Only Administrators may add and edit other user records. **PedCath** ships with a single Administrator account:

Username: **SSS**

Password: 'PedCath8!' (without quotes)

You can safely delete this user account once you've added a new Administrator. Typically, usernames are the users' initials. When a user is initially added, his or her password is set to 'Taussig1!'. An administrator may reset another user's password. This will set it to 'Taussig1!'. Anytime someone logs in with 'Taussig1!' as his or her password, **PedCath** will force him or her to change it to something different. Neither usernames nor passwords are case sensitive.

We recommend that you make at least one regular user of **PedCath** who is somewhat computer-savvy an Administrator. At many institutions, all attending physicians and perhaps some fellows are Administrators.

Maintenance

We designed **PedCath** so that normal users are able to update and maintain it. Once **PedCath** is installed and running, any reasonably capable Administrator should be able to handle updates and maintenance. There is a simple Administrative Console application that's accessible via the Windows Start Menu or by running the executable directly from within the **PedCath** program folder. We recommend that you run the database maintenance regularly (once a quarter is typical, or whenever issues arise). There is a maintenance reminder feature available within the Administrative Console.

Summary

- **PedCath** must be installed on each local computer where you want it to run. You can install it from the CD or from the network.
- Each instance of **PedCath** must have read/write privileges to:
 - The Data Folder
 - The Program Folder
 - Two keys in the Windows Registry
 - The Import Folder (if applicable)
 - The Export Folder (if applicable)
- The initial user is 'SSS' with password 'PedCath8!'.
 - A new user's initial password is always 'Taussig1!'. Resetting a user's password sets it to 'Taussig1!'.
- Users with Administrator privileges can update and maintain **PedCath**.

See Also

PedCath User's Manual – Using **PedCath**

Appendix A: Glossary

Administrative Console

A program that allows a **PedCath** Administrator to perform various administrative tasks without having to open **PedCath**. The Administrative Console is installed with **PedCath**, in the Program Folder and is accessible via the Windows start menu.

Data Export

PedCath can export data in a variety of formats, manually and/or automatically.

Data Folder

This is the folder that contains all the **PedCath** database files. It also contains image files, document files and various other files that are part of the PedCath data and/or are necessary for **PedCath** to operate properly. The Data Folder can reside anywhere on the network, as long as each running instance of **PedCath** has read/write access to it.

Data Import

PedCath has the ability to import data from most major hemodynamic monitoring system in use today. Please contact Scientific Software Solutions, Inc. for more information if you do not already have Data Import features enabled.

Direct Data Import Utility (see Data Import)

Export Folder

This is a folder where **PedCath** will save Patient Reports if the automatic export feature is enabled. **PedCath** will need write permission to this folder.

Import Folder

This is the folder where **PedCath** will expect to find files exported from your cath lab after the case. Usually, this is a permanent location on the network, but it can be any physical medium used for transporting data if necessary. **PedCath** must have read access to this folder, and will perform best if it also has write access to it.

Local Program Folder

This is the folder into which **PedCath** is installed on a local machine. **PedCath** needs to read and write to this folder during normal operation.

Program Folder (see Local Program Folder)

Update Wizard

An application that users can use to update **PedCath** to the latest version over the Internet or to any version by using a **PedCath** update file (*.p7u). The Update Wizard is installed with **PedCath**, in the Program Folder and is accessible via the Windows start menu.

Appendix B: Permission Levels

<i>Action</i>	<i>Admin</i>	<i>Full (Edit All)</i>	<i>View Only</i>
Enter PedCath	X	X	X
Add, Edit Patient	X	X	
Delete Patient	X	X	
Add, Edit Cath Record	X	X	
Delete Cath Record	X	X	
Add Personnel	X	X	
Edit Personnel Display, Initials	X		
Edit Other Personnel Data	X	X	
Delete Personnel	X		
General (Local) Options	X	X	X
User Options	X	X	X
Global Options	X	X	
Administrator Options	X		
Add, Edit, Delete Documents	X	X	
Edit Cath Personnel List	X	X	
Add, Edit, Delete Hemodynamic Data	X	X	
Add, Edit, Delete Diagrams	X	X	
Add, Delete Diagnoses	X	X	
Add, Edit, Delete Images	X	X	
Add, Edit, Delete Comments	X	X	
Import Cath Data	X	X	

System Restore

It is critical that you have a regular system in place for backing up all of the data files, heart diagrams and image files associated with **PedCath**.

We recommend backing up the entire PC7_NET folder to an off-site location on a monthly basis. A monthly backup is a good way to prevent a large amount of data loss although more frequent backups would be ideal.

***Make sure you have a backup system in place
NOW!!!***

PedCath⁸

Tutorial

Logging into **PedCath** for the first time

If you are logging into **PedCath** for the first time, the default password is *Taussig!* Once you have used this password to login, you must change it immediately, and will be prompted to do so.

If you are using a demo version of **PedCath**, there is no login screen.

Exploring the **BROWSE** screen

Name /	MRN	Cath Date	Cath No.	Staff Name	Role
Deere, John	1234567	09/24/1995	783	Matheme MD, Paul	Attending
Doe, John	123456789012			Heller MD, Felice	Fellow
Impack, Iggy K	Dther123				
Oxygen, Lotsa	123				
Plastie, Angela	BB518				
Rogers, Buck	1285656				

Find Add Patient Edit Patient Add Cath Edit Cath Personnel Record

Diagrams: Diagram 1 of 1

Calculations: Set 1 of 2: Pre-valvuloplasty
Some Calculation Values Overridden
Qp = 2.97 L/min (5.82 L/min/m2)
Qs = 2.58 L/min (5.06 L/min/m2)
Rp = 2.19 units (1.12 units x m2)
Rs = 26.72 units (13.63 units x m2)
Qp/Qs = 1.15 : 1
Rp/Rs = 0.08

Diagnoses / Procedures: 85. Pulmonary Valve Stenosis
597. Balloon Pulmonary Valvuloplasty

Age at cath: 8 months

Comments: Bicuspid pulmonary valve
Moderate pulmonary insufficiency.
Hyperdynamic outflow tract.
No residual outflow tract gradient.

The **BROWSE** screen gives you a visual snapshot of every patient and every cath. Take a moment to browse through the sample patients. Clicking on a patient will update the bottom portion of the screen. Notice how **PedCath** displays patients with multiple caths (Buck Rogers) and multiple sets of hemodynamic data (Lotsa Oxygen and John Deere).

Adding a New Patient to PedCath

Click on the **Add Patient** button



or click on the **New Patient** icon.



Fill in patient information as shown in the box.

Boxes with labels shown in bold are required to save the patient record.

Patient Record

Diagram Template

First Name: Jane
 Middle: A
 Last: Doe
 MRN: 12345678
 Date of Birth: 12/31/1994
 Gender: **Female**
 Race: White; Native Hawaiian/Pacific Islander (Native Hawaiian)

Template Not Found

Mullins ID = ---

OK Cancel

Adding a Cath Report

With the patient you just entered highlighted, click the **Add Cath** button,



or click the **New Cath Report** icon . This will open the **Edit Cath Screen**:

Edit Cath Report

File Edit View Tools Report Components

Patient Information: First Name Jane, Middle Name A, Last Name Doe, Medical Record Number 12345678, Date of Birth 12/31/1994, Gender Female

Report Components: Dx, [Camera], [Print]

Case Information: Cath Date 09/24/1995, Weight (kg) 12.3, Height (cm) 82.0, Cath Number 1234, Account Number, Vein Brac 12fr, RFem 9Fr, Artery Right carotid 4fr, Fluorotime (min) 16.00, Contrast Total (cc) 45.00, Rad Dose (mGy), Total DAP (μGy-M2)

Personnel: Matheme MD, Paul (Attending), Heller MD, Felice (Fellow)

Hemodynamic Sets: Set 1 of 2: Pre-avalvuloplasty

Calculations: **Some Calculation Values Overridden**
 BSA = 0.51 m2
 Qp = 2.97 L/min (5.82 L/min/m2)
 Qs = 2.58 L/min (5.06 L/min/m2)
 Rp = 2.19 units (1.12 units x m2)
 Rs = 26.72 units (13.63 units x m2)
 Qp/Qs = 1.15 : 1
 Rp/Rs = 0.08

Hemodynamics: Heart Rate (bpm) 128, Hemoglobin (gm/dL) 12.5, pCO2 39.0, Inspired O2 (%) 21, O2 Consumption (VO2/m²) 198, pO2 89.0, Thermo CO (L/min), Blood pH 7.37, HCO3 22.0

Right					Wedge				
O2%	Site	Sys/A	Dias/V	Mean	Right Mean		Left		
75	SVC				6		7		
77	RA			4					
78	RV	68	5						
78	PA	18	10	13					
	RPA	17	9	12					
	LPA								

Administrator 06/02/2017 18:53:02 | 6

Entering Case Information

Add information about this cath in the *Case Information* box.

Click the clock icon to the right of the Cath Date to enter the procedure start and end times.

Click **Set Access** to set the vein and arterial access data.

Choose **Both** for the Access Location to add both Venous and Arterial access data. Select the access site and enter the sheath size for the largest sheath used on the Venous Access tab.

If more than one access site was used, click the Override button within the Report Text section next to Vein and enter the access data as you would like it to appear on the report.

Click the Arterial Access tab and choose Right Carotid. Enter 4fr for the sheath size.

You can optionally choose Closure Methods from a Pick list here as well (those are currently collected by the IMPACT Registry and currently not shown on the PedCath report).

Selecting and Removing Cath Personnel

Click on the **Add Personnel to Cath Report** icon,



You may select personnel by highlighting their names and clicking OK

To change someone's role, click on his or her role in the list for this cath, and use the drop down list to select a new role.

To remove personnel from a cath, click on the **Remove Personnel** icon.



Only administrators may add new personnel to the **PedCath** master list. Users with Full-Edit privileges can add "no-access" staff members to the master list such as referring physicians.


Entering Hemodynamic Sets

Go to the **Hemodynamics Sets** section of the screen (left, middle) and enter a title, "post intervention" in the box next to the "Set 1 of 1" text. Each cath may have up to eight sets of hemodynamics.

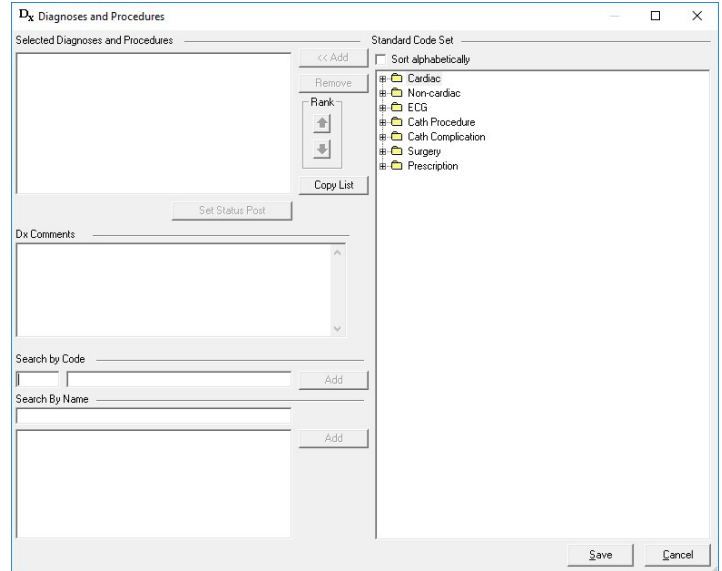
Now click on the Hemodynamics tab unless it is already open and add the cath information listed below.

Hemodynamics					User Fields		Measurements		
Heart Rate (bpm)	68	Hemoglobin (gm/dL)	10.9	pCO2	41.0				
Inspired O2 (%)	21	O2 Consumption (VO2/m ²)	118	pO2	91.0				
Thermo CO (L/min)		Blood pH	7.42	HCO3	26.0				
Right					Wedge				
O2%	Site	Sys/A	Dias/V	Mean	Right Mean	6	Left Mean	6	
71	SVC								
	RA	16	12	11					
	RV			P					
71	PA			15					
	RPA								
	LPA								
Left									
O2%	Site	Sys/A	Dias/V	Mean					
96	LA								
	LV	110	8	S					
	aAO	108	62	83					
96	dAO	105	52	80					

Entering Diagnosis/ Procedures

Click on the **Diagnosis and Procedures icon** . If asked, choose Yes to save your changes. The **Diagnosis** screen will be displayed.

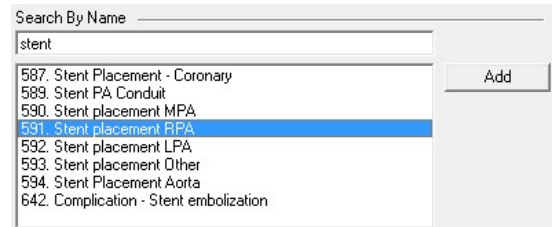
Note: This tutorial assumes you are using the diagnostic code set shipped with the **PedCath** demo CD. If your screen has a different list on the right, you are using one of the alternative codes sets available with **PedCath**. You will still have the tree list and search capabilities described below, but the code descriptions, code numbers and category organization will be different.



A tree list of all possible codes is available in the right-hand box. The upper-left box is for diagnoses and procedures associated with this cath. The two sections in the lower left contain search tools to help you find the correct codes. You may search by code number or by text fragment.

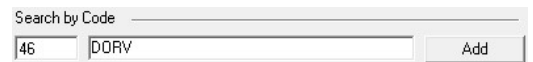
Text Search

In this example, we will search by name first. Enter *stent*. You can see that two of the procedures you performed are listed. To place them on the selected procedures section either double-click the selection or click the Add button on the right.



Code Search

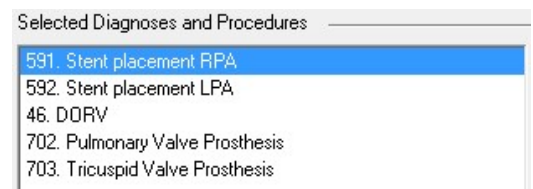
Now search by code. In the select code box, enter 46. DORV should pop up next to it. Click the Add button to place it in the procedures box.



Tree List Search

Finally, we can use the tree list to find our last two Dx. Codes. In the tree list, click on the + sign next to Surgery Procedure. Scroll down to PVR and TVR (codes 702 and 703). When a code has been highlighted, click on the <<Add button to add it to the list of Selected Diagnoses and Procedures.

Now highlight one of the 5 codes for this cath and use the **Rank** arrows to move it up and down in the list. **PedCath** allows you to set the relative importance of each diagnostic code.




Click the SAVE button to exit from this screen.

The Diagram Manager

Click on the **Diagram Manager** icon,  under the **Report Component Managers** section (upper right on the Edit Cath Report Screen).

Each cath may have up to three diagrams associated with it.

Selecting a Heart Diagram

Click on the **Add Diagram** icon,  to view a selection of different heart diagrams.

For this patient, click on the + sign next to *Postoperative Anatomy*

Then choose

Right Ventricle to Pulmonary Artery Conduit with Patch Closure of the Ventricular Septal Defect for Truncus Arteriosus and Right Aorta Arch

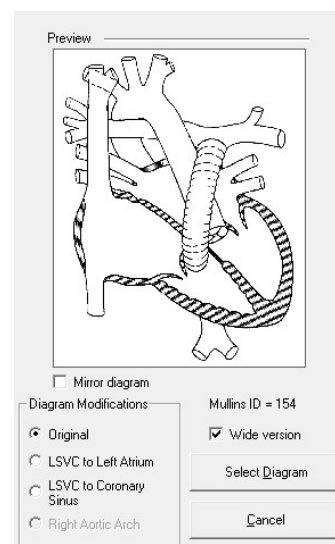
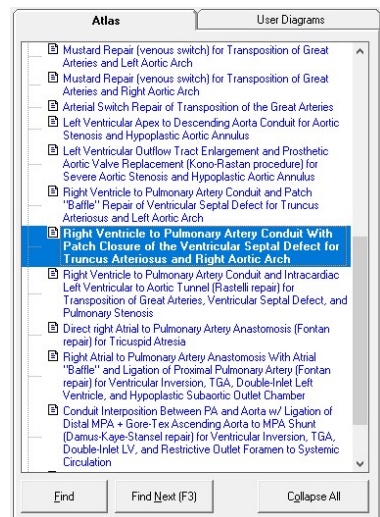
The selected diagram will be shown in the Preview window. There are a number of built-in variations of each diagram as well. These include wider versions with extended pulmonary arteries, mirrored versions for dextrocardia patients, and variations that include a LSVC (to either the Left Atrium or Coronary Sinus) and a Right Aortic Arch. These options can be set underneath the diagram preview. For this tutorial we will use the Original diagram.

Click the Select Diagram button to add the diagram to this cath report. (You can also double-click on the heart diagram title in the Atlas listing to add the diagram if the Diagram modifications are already set as desired).

When you have selected your diagram, PedCath returns to the **Diagram Manager** screen.



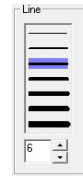
To edit your new diagram, just click on the **Edit Diagram** icon.



Editing a Heart Diagram

Erasing

Choose the **Eraser Tool** icon.  Next click on a medium sized line.

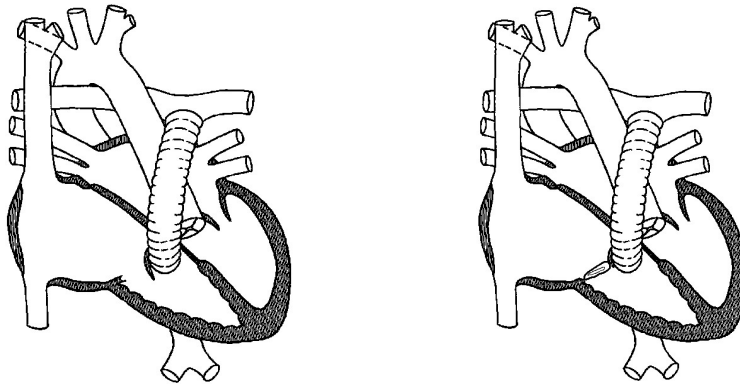


Next erase part of the Tricuspid Valve by drawing over it.


Freehand Drawing

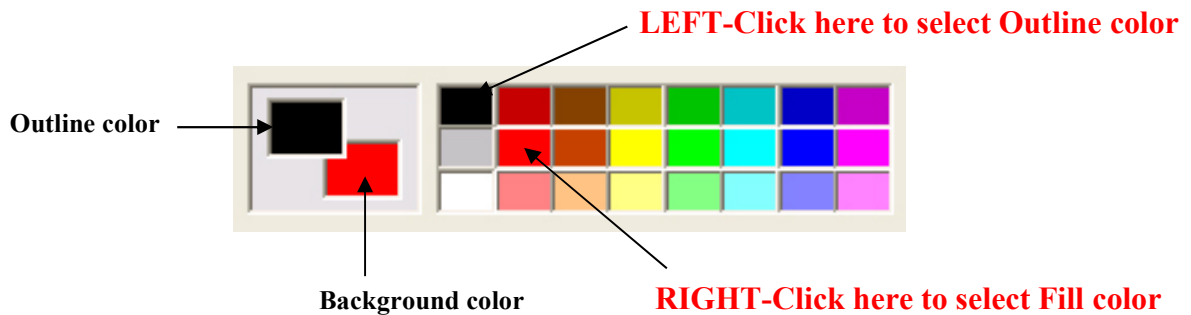
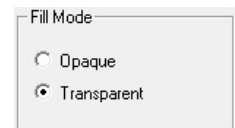
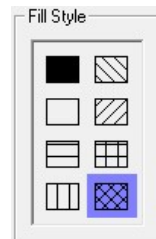
Choose the **Freehand Tool** icon. 

Choose a smaller line width. Sketch a prosthetic tricuspid by drawing a loop where the original valve was.

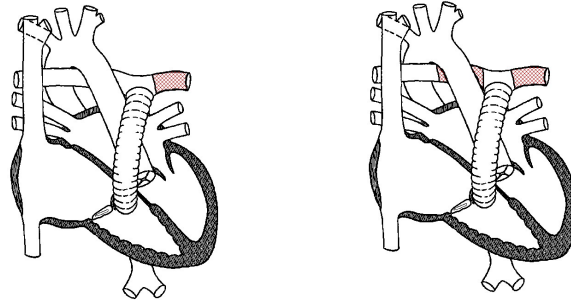


The Blob Tool



Click on the **Blob Tool** icon. 
 Select a thin line, a diagonal crisscross **Fill Style**,
 a transparent **Fill Mode**, a black outline,
 and a red background.



Use the **Blob Tool** to draw stents in the Pulmonary artery by tracing an outline of each stent along the walls of the artery.



Undo and Erase


If you make any errors you can either use the **Undo** icon  to erase the last thing you drew, use the **Freehand Tool** set to white to erase, or use the **Selection Tool**  to click on the item to make a box appear around the item then press the Delete key.

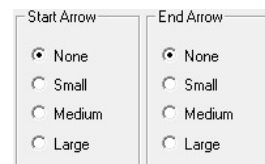
Saving Diagram Templates

Because you made extensive changes to the diagram, click on the **Save Template** button to save it as a permanent template for the patient. This template will be available for any later cath for this patient.

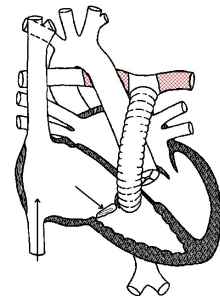


Using Arrows

To show the path or direction of the catheter, click on the **Line Arrow Tool** . Select a line width, no **Start Arrow**, and a medium **End Arrow**.



Choose a black foreground and a white background. Now start the arrow at the beginning of the IVC and ending it in the RA. Draw another arrow beginning in the RA and ending in the RV.

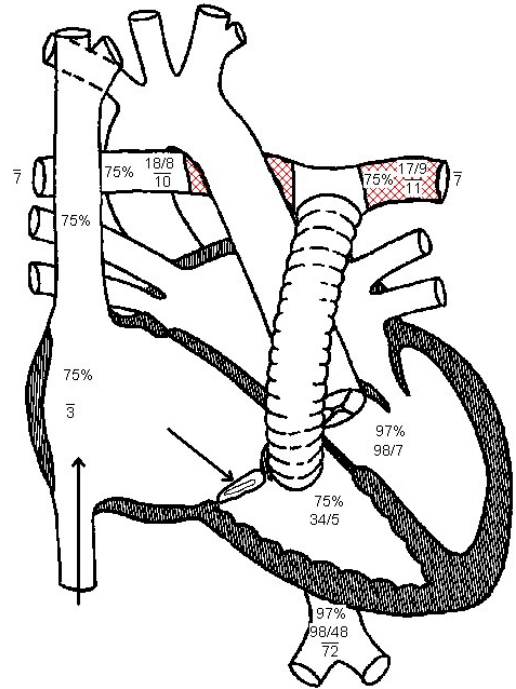


Embed

Embedding Hemodynamic Values into your Diagram

Click on the **Embed** button to insert all of the hemodynamic data into the diagram.

Your final diagram should look similar to this one. Close the Edit Diagram box, saving the patient diagram for this cath (right).



PedCath²

Using PedCath

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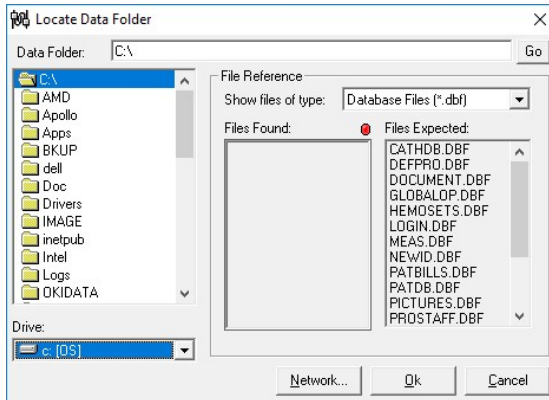
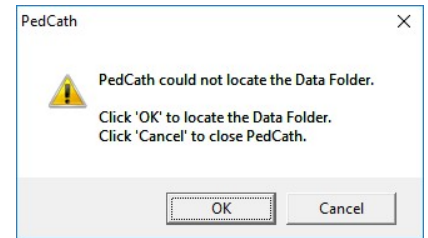
Logging In

Start **PedCath** as you would any Windows program: Click the Start menu, and select **PedCath** from its own program group.

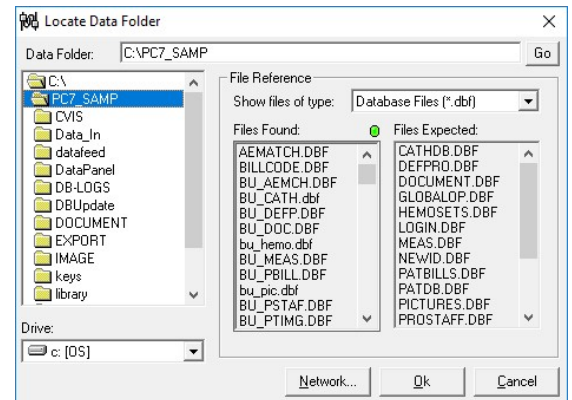
Locating the Data Folder

If this is the first time **PedCath** has been run on this computer, a message box will appear, telling you that **PedCath** could not locate the Data Folder. Click OK and the Locate Data Folder screen will appear. Browse to locate your **PedCath** data files.

When you have located the proper directory, the red light above “Files Found” will turn from red to green. When the light is green, you are ready to proceed. Click OK.



Locate Data Folder Screen - Red Light

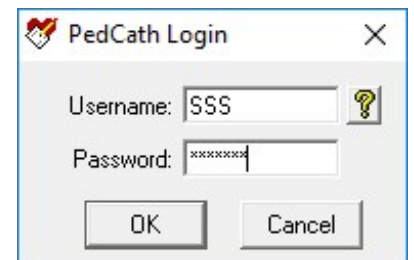


Locate Data Folder Screen - Green Light

Your Password

After you have located the data files, the **PedCath** login Screen will appear. Enter the user login and the password given to you by your network administrator.

The default password for new users is **Taussig1!** Once you have used the password to login, you must change it immediately, and will be prompted to do so by **PedCath**.



Dr. Helen Brooke Taussig, often called the "mother of pediatric cardiology," was born in 1898. Dr. Taussig attended the medical school of Johns Hopkins University, where she became interested in cardiology. In 1930, she assumed leadership of the cardiology clinic at Johns Hopkins, where she encountered many "blue babies." She investigated the reasons for cyanosis and discovered that its major cause in cases of Tetralogy of Fallot was insufficient blood flow to the lungs.

Dr. Taussig was a pioneer in devising surgical treatments for congenital heart disease. In 1944, the Blalock-Taussig Shunt operation, which she developed with surgeon Dr. Alfred Blalock, was first performed. The publication of this procedure revolutionized the medical approach to congenital heart disease. It also inaugurated the new specialty of pediatric cardiology and led to the saving of many thousands of lives in the decades to come.

In later years, her failing hearing made Dr. Taussig rely increasingly on her sense of touch, using her hands to diagnose cases of congenital heart disease. Helen B. Taussig's contribution to pediatric cardiology was recognized through the bestowal of many honors, including the United States' Medal of Freedom, the French Chevalier Legion de la Legion d'Honneur, and the Italian Feltrinelli Prize. She died in 1986.

Taussig



Photo © Karsh, used with permission.

! After you log in, **PedCath** opens to the browse screen, with snapshot views of every cath.

The Browse Screen

The patient list is located at the upper left part of the main screen. Each line shows a patient's first and last names, and the hospital history number (MRN). The cath list, in the upper middle, shows cath records that have been saved for the selected patient. Each patient may have multiple cath records, which are identified in the list by date and the hospital's cath number. To the right side of the screen is the staff list, which shows the personnel involved in each cath, as well as their roles.

The screenshot shows the PedCath software interface. At the top, there are menu options: File, Edit, View, Tools, Help. Below the menu is a toolbar with various icons. The main area is divided into several sections:

- Top Left:** Patient list table with columns: Name, MRN.

Name	MRN
Diene, John	1234567
Doe, John	123456789012
Impact, Iggy K.	Other123
Ogden, Leslie	123
Plaste, Angela	BB518
Rogers, Buck	1296566
- Top Middle:** Cath list table with columns: Cath Date, Cath No.

Cath Date	Cath No.
05/24/1995	1783
- Top Right:** Staff list table with columns: Staff Name, Role.

Staff Name	Role
Hastings MD, Paul	Attending
Haler MD, Felice	Fellow
- Bottom Left:** Diagrams section showing a heart diagram with various catheters and measurements.
- Bottom Middle:** Calculations section showing hemodynamic data:

Set 1 of 2: Pre-valvuloplasty

Some Calculation Values Overridden

Qp = 2.97 L/min (5.82 L/min/m²)

Qs = 2.98 L/min (5.06 L/min/m²)

Rp = 2.19 units (1.12 units x m²)

Rs = 26.72 units (13.63 units x m²)

Qp/Qs = 1.15 : 1

Rp/Rs = 0.08
- Bottom Right:** Diagnoses / Procedures section showing:

Age at cath: 6 months

95 Pulmonary Valve Stenosis

597 Balloon Pulmonary Valvuloplasty
- Bottom Center:** Comments section showing:

Ecchymotic pulmonary valve

Moderate pulmonary insufficiency.

Hypodynamic outflow tract.

No residual outflow tract gradient.

The lower two thirds of the screen is devoted to a summary of the cath highlighted in blue in the cath list. On the left there are patient diagrams. In the middle are calculations derived from up to eight hemodynamic measurement sets. On the right are any diagnoses or procedures that accompany the present cath, along with their codes. Across the bottom are staff comments about the cath.

To view a patient's cath, either click on the patient's name, or use the arrow keys and the "Page Up" and "Page Down" keys to locate the desired patient's record.

! To view a larger version of the diagram, double click on it.

Sorting patients

When you start, you will notice a blue frame around the patient list. This indicates that the patient list is active. If you click on a cath record or staff record, the corresponding list will be highlighted.

Records may be sorted in ascending or descending order by clicking on the appropriate column heading. For example, to arrange patients by medical record number, click MRN in the gray box at the top of the patient list. A small arrow will appear next to MRN. To reverse the order, click in the same place again. Clicking on any of the gray field headings - Name, MRN, Cath Date, Cath No., Staff Name, or Role - will also provide quick sorting by field.



Locating Patients

When the patient list is sorted alphabetically, you may quickly jump to records with a specific beginning letter. For example, if the patient list is sorted by name, typing **S** will highlight the first patient whose last name begins with an "S." Likewise, if the list is sorted by medical record number, typing **4** will highlight the first patient with a medical record number beginning with "4". For more detailed searches, there is a find function to locate a patient. To access this function, press Ctrl+F [hold down the Ctrl key, press F, then release both], click on the binoculars on the toolbar at the top of the screen, click on the Find button below the patient box, or select "Find..." from the tools menu. The find button will highlight the first patient it finds matching the search string you enter.


Choosing View > Patient Filter Search from the main menu will allow you to filter the patients shown in the grid by the name, MRN, or internal patient ID.

Different views in the browse screen

In the default view, cath records are sorted by patient. There are other views available and the view may be changed by using the View menu at the top of the main window. The following views are available:


- View by Patient – Shows the list of all patients within the patient grid.
- View by Cath – Shows the list of all cath reports within the cath grid.
- View by Staff – Shows your personnel list within the staff grid. When highlighting a staff member, all cath reports where they were listed in the case staff will be loaded into the cath grid.
- Patient Filter Search – Will allow you to filter the patients shown in the patient grid by name, MRN, and internal patient ID. The patients will be filtered as you type within one of the search boxes. The patient name filter will include results from partial patient names. For instance typing in “**Wil**” could return patients with the last name “**Wilson**” and “**Wilkins**”, while typing “**Smith, J**” could return “**Smith, John**” and “**Smith, Jane**”. The patient grid will be empty initially.
- View by Recent Cath – Similar to View by Cath but will show only the most recent 30 cases within the cath grid. When scrolling to the end additional cases are loaded. This can improve load times when your cath database becomes large.

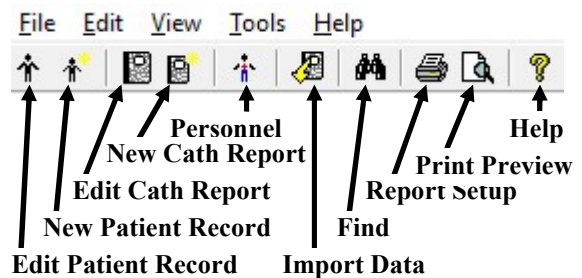
You can set your default view for PedCath to load upon startup, in the options on the User tab. Setting this to Patient Filter Search or By Recent Cath will speed up load times.

 **You will need to be in View by Patient or Patient Filter Search mode in order to add new patients, add cath reports, or import data from a hemodynamics system.**

The Browse Screen Toolbar

The toolbar is located at the top of the screen, just below the menus (File, Edit, View, Tools, and Help).

 **If you forget what a button does, you can find out by leaving the mouse over the button for a few seconds. A label will appear with the name of the button.**



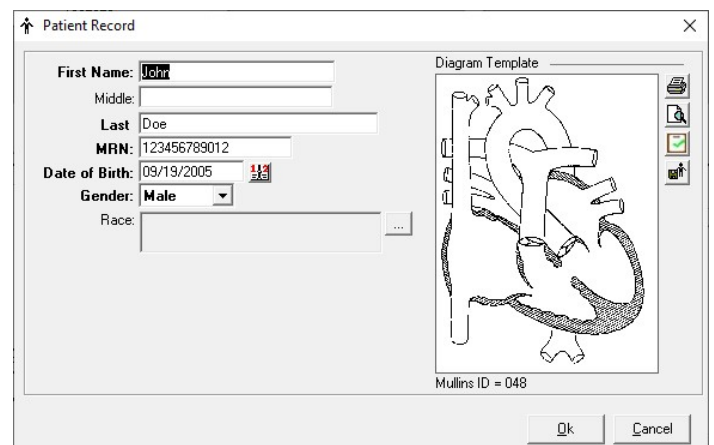
Editing patient demographics




Clicking the Edit Patient button or the Edit Patient icon will pop-up the Patient Record Window.

In this window, you may edit the patient name, MRN, date of birth, gender, and race. Any data with a bold label is a required field. Any data you enter in this window will be automatically saved after you click OK.

If a diagram template has been created, it is shown here as well. From this screen you can print, copy it to the clipboard, and save to an image file. Patient demographics can be included on the printout. Templates can be added to the patient record from the Browse screen Edit menu, or after editing a diagram for a cath report (See section on Diagram Manager).



The screenshot shows the 'Patient Record' window. On the left, there are input fields for: First Name (John), Middle, Last (Doe), MRN (123456789012), Date of Birth (08/19/2005), Gender (Male), and Race. On the right, there is a 'Diagram Template' section showing a heart diagram. At the bottom right, there is a 'Mullins ID = 048' label and 'Ok' and 'Cancel' buttons.

 **Patient demographics may be edited by double clicking on the patient's name.**

Adding new patients



Clicking the Add Patient button or the Add Patient icon will pop-up an empty Patient Record Window.

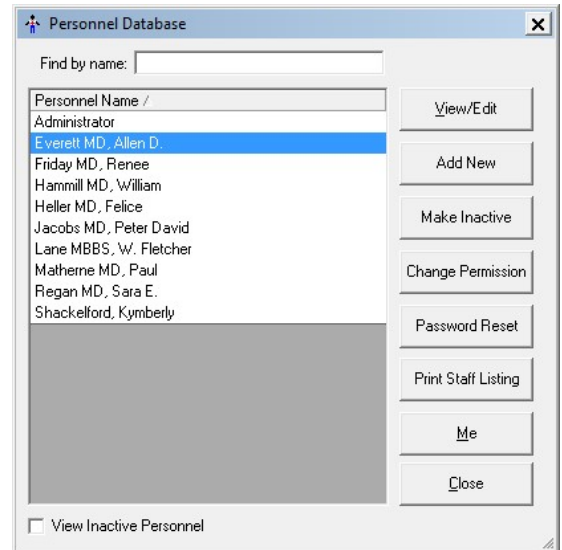
Editing staff records



Clicking the View Personnel icon will pop up the staff list. Select a staff member and click View/Edit to make changes.



New staff may be added by those with administrator level access, under; Tools-Options-Administrator-Personnel. You can also edit staff from the Browse screen by choosing view-Personnel.



Editing cath data



To edit an existing cath report; 1) click on the Edit Cath Report icon, 2) double click on the cath date in the cath list or 3) click the Edit Cath button below the cath list.

Adding a new cath



To create a new cath report; 1) click on the New Cath Report icon, or 2) click the New Cath button below the cath list.

The Edit Cath Screen

Demographic information

In the previous section we used a pop-up window to add and edit patient information. These same fields may also be edited in the top two lines of the Edit Screen.

Case information

The case information frame includes cath date, cath number, and procedure start and end times; access notes, height and weight; as well as contrast, radiation dose and fluoroscopy data. The only required field is Cath Date. (Cath Number and Account Number may be required depending on your export settings). The Vein/Artery access locations and sheath size can be set by clicking the Set Access button. The access locations are chosen from an option list. If there is more than one access site or sheath used, enter the one with the largest sheath size using the selections provided, and use the override boxes to set the text as it should appear on the report. Closure methods can be entered here as well; those are part of IMPACT data collection and are not included on the PedCath report.

Adding cath personnel and their roles



Add personnel to this cath by clicking on the Add Personnel to Cath Report icon.



Delete personnel from this cath by clicking the corresponding row in the grid and clicking on the Remove Selected Person from Cath Report icon.

To change the role of the staff member, either double-click on the role, or click once and then click on the gray box on the right hand side of the field. A drop down list will appear with the roles at your hospital.

! *When adding personnel, users with Full-Edit permissions will be able to add “No-Access” staff to the global personnel database here if they don’t already exist, such as Referring Physicians.*



Hemodynamic Sets



You can use the Tab key to move logically through the data entry screen. Pressing Tab will move to the next field while Shift-Tab will move to the previous field. Try it!

Although the top half of the edit window stays the same for an entire cath report, the bottom half changes with each set of hemodynamic measurements. Up to eight hemodynamic sets can be associated with a single cath. The name of the set may be selected from the drop down box on the left hand side of the screen. This will contain common conditions that your hospital uses to gather hemodynamic data. You may also manually enter a condition by double-clicking this box and typing the name. Add or delete sets by clicking on the buttons below the set name. When deleting a set, a dialog box will pop up to confirm the deletion.

Calculated values

Calculated values are shown in the lower left-hand corner of the edit screen. Clicking the “View Calculations” button displays a window with all formulas and calculations displayed.

PO2	Site	O2%	Default	Mean	Default Mean
0	MV	75	75 SVC	4	4 RA
0	PA	78	78 PA	13	13 PA
0	PV	98	0 LA	6.5	6.5 Avg.
0	SA	98	98 dA0	73	73 dA0

Any default value used in these calculations can be changed by clicking the Calculation Override button and changing the appropriate values in the window that appears.

Oxygen consumption calculator

You may enter a value for Oxygen Consumption, leave the field blank or you may use **PedCath's** built in oxygen consumption calculations:

Assumed O2 by LaFarge method

The LaFarge method uses patient gender, age, and heart rate to calculate an assumed oxygen consumption. The LaFarge method is only available for patients between the age of 3 and 30.

Assumed O2 by Seckeler method

The Seckeler method uses patient age, weight (kg), whether the patient is single ventricle, and if they have a critical illness. The original equation was validated for patients 0 through 59 years old. In addition, patients with other conditions, such as pulmonary hypertension, could be considered "critically-ill", but these populations were not specifically validated in the original manuscript. Use for these patients is based on clinical judgement.

Indexing a measured value:

If you use a measured value for oxygen consumption (ml/min), the calculator can use the stored value for Body Surface Area to compute an indexed value (ml/min/m²). When you open the calculator, the BSA value will automatically appear as the divisor for the oxygen consumption calculation. Patient height and weight are used to calculate BSA. **If height and weight data should change, you must re-calculate the value for oxygen consumption.**

Age default:

If your institution has set up a list of age-based defaults to use, and the patient falls within one of the age ranges, the default value will be shown. Age-based values can be useful for patients under 3 years old, when the LaFarge method cannot be used.



User Fields

PedCath intentionally limits the number of reporting sites in the interest of brevity and clarity. Pressures and saturations not listed in the site grid can be reported in the comments section and/or added to the diagram.

PedCath now offers eight additional sites. The site labels can be prefilled with commonly used sites (called Institutional Sites in the options). Patient specific sites may also be used to record sites specific to the current case. If the data is filled in for common sites and the report is saved, any rows without measurements will be removed freeing up space for additional patient specific sites.

O2%	Site	Sys/A	Dias/V	Mean
60	I/C			6
97	Femoral Artery	99	42	63
97	L.S. Pulm. Vein			8
90	R.U. Pulm. Vein			7



Measurements

A new group of measured values is available in **PedCath**.

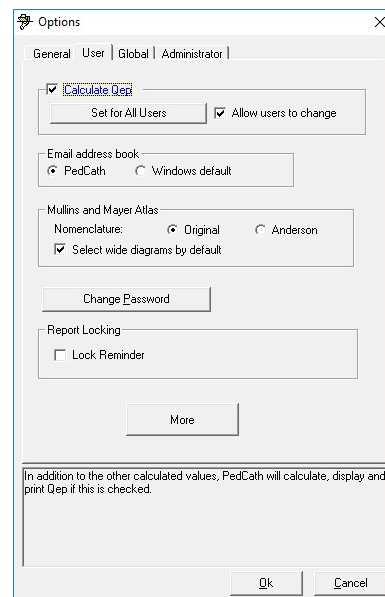
Review the default settings under **Tools>Options>Administrator>Calculations** to set global values for your institution.

Ventricular Volume (ml)				Ventricular Mass	
	EDV	ESV	EF%	gm	
Right	46.5	23.0	51%	20.0	
Left	26.3	8.9	66%		

Valve Diameter		PA Diameter	
	mm		mm
TV	18.0	Right	10.3
MV	19.0	Left	8.8
PV	15.0	PA Index: 262	
AV	13.0	PA Area Index: 1.22	

Qep

PedCath can calculate, display, and print QEP values. In the browser screen, go to **Tools>Options>User** and click on the calculate QEP checkbox to turn QEP calculations on or off.



PedCath Options

From the Browse Screen, select Tools>Options to open the options screen

General Tab

Allows the user to set guidelines for the destination folder for exported files, temporary file storage, diagram previews and startup options.

These are per-workstation settings.

User Tab

Includes options specific to a PedCath user. Options include calculation of QEP, whether or not to use smart name and/or date formatting, choice of the email address book and protocol, and whether or not to use the original or Anderson Mullins and Mayer Atlas nomenclature.

The user password may be changed under this tab as well.

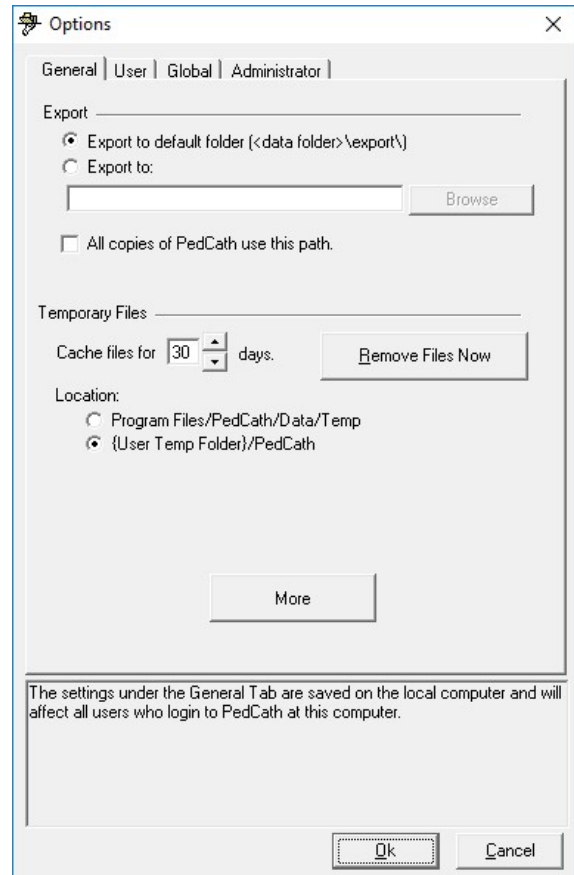
Global Tab

Personnel roles may be added, deleted, or their rankings changed under this tab. Which staff roles will be included on the cath report and which will be authorized to lock a cath may also be determined here.

Administrator Tab

This tab includes global settings accessible to a PedCath administrator. The options available include:

- Managing the personnel database, configuring staff options and enabling Active Directory support.
- Setting calculation constants and options
- Setting Institutional sites (up to 8).
- Configuring import and export options, custom interfaces, and CVIS integration options.
- Launching the Administrative Console to perform maintenance and other administrative functions. (See pg 32).
- Setting report locking options.
- Setting the billing codes code set (ICD-9, ICD-10, or ICD-11) and code sync options.
- Specifying field units (for radiation fields).
- Other Misc. options such as auto-incrementing the cath number and auto-logout.



PedCath Imports

Overview

If your institution is licensed to use the **PedCath** Direct Data Import interface for your Cath Lab, you will be able to import patient demographics, case, and hemodynamic data as well as the procedure log and any available angio/snapshot images directly into **PedCath** from your hemodynamic monitoring system.

The cath report should not exist prior to import; it will be created during the import process. **PedCath8** however does give you added flexibility to run the import at any time into an existing case to bring in select components (see the **Import Into an Existing Cath** section).

You are always free to create and edit case data manually, whether it is brought in with the Direct Data Import Utility or not.

Please note the following sections show the interface with the GE MacLab. The interfaces have minor differences, but largely work in the same way.

Running the Direct Data Import Utility



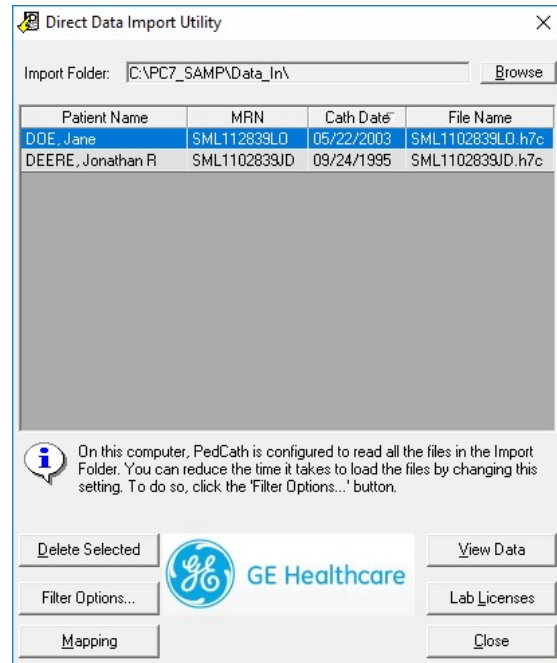
From the **PedCath** Browse screen click the Import Data button on the toolbar, or choose Tools > Import Cath Data (F4) from the main menu.

The Direct Data Import Utility screen will show a list of cases that have been sent to the Import folder from your hemodynamic system.

Any entries that show up in red have already been imported and cannot be imported again. (the administrative Import settings will allow you to configure whether files should be deleted or renamed after they are imported so that they will no longer show in the list – cleaning up the files will also greatly speed up loading the Import Module).

Any entries that show in yellow should be checked to see if the patient's demographics (Name, Birth Date, MRN) in the hemodynamic system exactly match what's currently in **PedCath**. Double click the entry to see what fields do not match.


PedCath8 will allow you to import more than one case per day for a given patient.




To start the import process, highlight a patient's case in the grid and click **View Data**. This will bring up the Import Review screen.

Import Review Screen

The Import Review Screen will show you what will be brought into PedCath during the import. You will have the chance to choose the best hemodynamics to bring in for the case, map staff to **PedCath** staff records, and selectively import case data, documents and images.

 You have control to set any grid cells that have a white background; the cell values will determine what data will be brought into PedCath and what fields they will be stored in.

 Any rows with blank white cells will not be brought into PedCath.

PedCath - Direct Data Import Utility 3/3


Document and Image Resources:

Import	Res. Type	Title/Description	Source
<input checked="" type="checkbox"/>	Document	Measurement Log	m:\PedCath8_DB\PC860_SAMP\data_In\SML1102839LO.h7c
<input checked="" type="checkbox"/>	Document	Document Import 1	SML1102839LO.doc
<input checked="" type="checkbox"/>	Image	Image Import 1	m:\PedCath8_DB\PC860_SAMP\data_In\SML1102839LO.tif

Patient Data:

Field Name	Information
PT-ID	SML112839LO
PT-NAME	Doe, Jane
PT-DOB	01/01/2000
PT-SEX	F

Hemodynamic Data:

 To import a value, highlight the value in the grid below. Then choose the PedCath field in which you would like to store the value from the drop-down list in the PedCath column.

Field Name	Data	PedCath
Room Air Rest		
HR	150	Heart Rate
CA PRESSURE	18/8/10	RA Pressure
RV PRESSURE	80/10	RV Pressure
PA PRESSURE	0/0/50	PA Pressure
RPA PRESSURE	75/30/50	RPA Pressure
RPCW MEAN	11	Right Wedge Mean
LPCW MEAN	12	Left Wedge Mean
LV PRESSURE	78/11	LV Pressure
DSA0 PRESSURE	78/49/61	DAD Pressure
SVC O2SAT	54.00	SVC O2 Saturation
RA O2SAT	82.00	RA O2 Saturation
RV O2SAT	86.00	RV O2 Saturation
PA O2SAT	86.00	PA O2 Saturation
LA O2SAT	97.00	LA O2 Saturation
DSA0 O2SAT	92.00	DAD O2 Saturation
HB	13.20	Hemoglobin
100% Oxygen		
HR		
CA PRESSURE	15/15/9	RA Pressure
RV PRESSURE	78/10	RV Pressure
RPA PRESSURE	72/28/46	RPA Pressure
LA PRESSURE	17/17/11	LA Pressure
LV PRESSURE	86/11	LV Pressure
DSA0 PRESSURE	86/53/67	DAD Pressure
SVC O2SAT	62.00	SVC O2 Saturation
PA O2SAT	98.00	PA O2 Saturation
LA O2SAT	98.00	LA O2 Saturation
DSA0 O2SAT	98.00	DAD O2 Saturation
HB	13.20	Hemoglobin

Cath Data:

Field Name	Information	Import
ACTNO	333	<input checked="" type="checkbox"/>
PT-HT-CM	92.00	<input checked="" type="checkbox"/>
PT-WT-KG	12.00	<input checked="" type="checkbox"/>
STUDYNUM	20050078	<input checked="" type="checkbox"/>
XRAY-FLTIME	11.40	<input checked="" type="checkbox"/>
TIME-CASESTART	05/22/2003	<input checked="" type="checkbox"/>
Event_Contrast	19.00	<input checked="" type="checkbox"/>

Personnel:

Field Name	Information	Initials	Role
Interventional Cardic	Allen D Everett M.D.		
Fellow	Regan E Sarah M.D.		
Fellow	Renee Friday M.D.		

Import CPT codes into Billing module

Information:

This is a new patient.

Delete file after importing

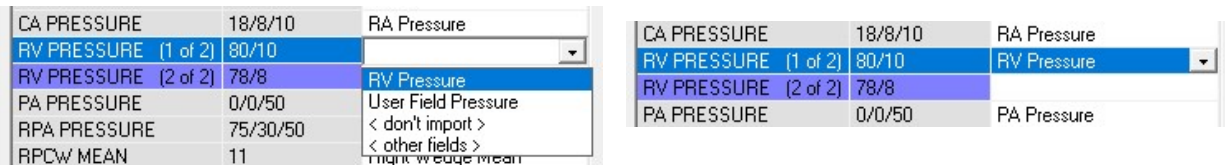
Hemodynamics

The first two columns of the Hemodynamics grid show the field names and data values taken from your hemodynamic system. The third column “PedCath” shows what fields the import data will be saved to in the **PedCath** database.

Because **PedCath** stores summary data and not every measurement taken, you must choose the best hemodynamic measurements to bring into **PedCath**, if more than one measurement was taken for a site per condition. By default **PedCath** will choose the last measurement taken.

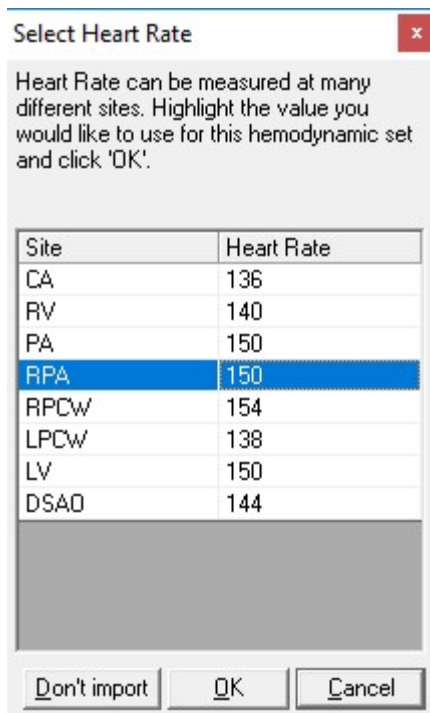
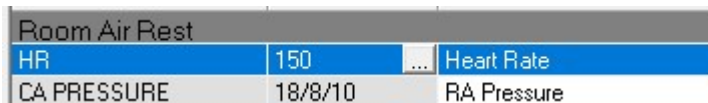
To choose a different measurement, click the cell within the “PedCath” column and choose the field name where the data should be mapped from the drop-down list. Any other measurements taken for that field will be cleared for that hemostat.

For example to bring in the first RV pressure rather than the second, choose *RV Pressure* in the pull down menu next to the first RV measurement:



PedCath will allow you to bring in at most eight hemodynamic sets. If there are more you must choose what sets to exclude from the import by highlighting a row within that set and clicking Unmap Set.

There are some measurements that PedCath stores per hemostat that may have been measured at multiple sites during a case condition (such as the heart rate or blood gases). Depending on your hemodynamic interface, PedCath will allow you to choose the site to take the measurement from, in a pop-up list. If you see a box with a “...” next to the measurement when you click the row, clicking the button will bring up the list of site measurements to choose from.



Staff

When you first start using the PedCath Direct Data Import Utility, the Initials and Role columns will be blank. You will need to associate those columns with the staff name and role in the first two columns, in order for PedCath to import the staff members.

To do this, expand the drop down list to find the users login (usually their initials) in the “Initials” column. Their default PedCath role will populate the “Role” column automatically. If this is not the correct role for the case, choose their role in the drop down list in the “Role” column.

PedCath will remember your choices for future imports.

Personnel:

Field Name	Information	Initials	Role
Interventional Cardiac Fellow	Allen D Everett M.D.	ADE	Attending
Fellow	Regan E Sarah M.D.	SER	Fellow
Fellow	Renee Friday M.D.		

Import CPT codes into Billing module

Information:

ADE-Allen D. Everett, MD
 RF-Renee Friday, MD
 WH-Hammill MD, William
 FH-Heller MD, Felice
 PDJ-Peter D. Jacobs, MD
 WFL-W. Fletcher Lane, MBBS
 PM-Matherne MD, Paul
 SER-Sara E. Regan, MD
 KS-Dr. Kymberly Shackelford
 SSS-Administrator
 < don't import >

View

Document and Image Resources

The document and image resources group shows what resources will be brought into **PedCath**. Documents will be saved to the Document Manager, and images to the Image Manager. If a resource is unchecked within the Import column, it will not be brought into PedCath.

You can view a document or image by highlighting it in the list and clicking the document/image icon on the right side of the screen.

You are also free to edit the document or image titles by double-clicking the cell within the “Title/Description” column.

Document and Image Resources: 3/3

Import	Res. Type	Title/Description	Source
<input checked="" type="checkbox"/>	Document	Measurement Log	m:\PedCath8_DBs\PC860_SAMP\Data_In\SML1102839LO.h7c
<input checked="" type="checkbox"/>	Document	Document Import 1	SML1102839LO.doc
<input checked="" type="checkbox"/>	Image	Image Import 1	m:\PedCath8_DBs\PC860_SAMP\Data_In\SML1102839LO.tif

Check All

Uncheck All

Import



When you have had a chance to review the import data and all of the mappings look good, click the **Import** button.

A new cath report will be created in PedCath, and will be highlighted on the Browse screen.

If you find particular measurements are not coming over or you would prefer certain measurements to be mapped to a different field, contact your PedCath administrator to work with Scientific Software Solutions to resolve the mappings.

Importing into an Existing Cath

PedCath will allow you to import data into an existing cath report as well.

Importing into an existing case could be useful for a number of scenarios:

- When you would like to work on the case diagram before the initial import.
- When importing documents/images that were not available when the case was first imported.
- Reimporting the hemodynamics, or any other section, and not having to delete the case and start over.
- Importing data after each condition during the case to review a summary of the hemodynamics/calculations in the lab or to auto-embed the measurements in a PedCath Live diagram.

To load data into an existing case, load the Edit Screen for that case and from the main menu choose

File > Import Into Current Cath

This will load the Direct Data Import Utility, with only matching cases showing, if any.

- Highlight the case and click **View Data**

This will show the Import Review screen, but with check boxes next to each report section. All sections are unchecked by default, except for the cath section (only with fields that are updated throughout the case such as fluoroscopy time and contrast, which will more easily allow for progressive imports). It is possible to configure the default overwrite options.

- Check off the sections that you would like to bring in (Cath Data, Personnel Data, Hemodynamic Data, and individual documents and images.)

- For the Hemodynamic Data section, set the Overwrite mode as desired:
 - **Fill Empty Fields:** This will bring data into fields that are blank in the PedCath database, and will leave existing data alone.
 - **Overwrite All:** This will overwrite all data whether something is there or not.

The number of hemodynamic sets must match what is currently in PedCath (or otherwise no hosesets should exist in the existing PedCath record).

The personnel records can either be merged with the existing records or replace them.

Check off any documents and images you would like to bring in. Any that match existing resources will replace existing ones by default. To bring those in as new resources instead click within the cell on the Overwrite Options column to set it to Add New from the pull-down menu.



Click **Import** to import the data into **PedCath**.

PedCath Exports

Overview

PedCath has a wide array of export capabilities to externalize the cath report data once it is completed. You can configure **PedCath** to allow manual exports and/or automatic exports when a cath report is saved or locked in a variety of both visual and data-driven formats.

Export Protocols

Files (Windows Sharing) – You can save the **PedCath** report data to one of several file formats. When running automatic exports you can specify local or shared network locations for the file(s) to be saved to. See the next section for supported file formats.

Print – PedCath will allow you to print the report to a printer attached to your local computer or network. There are many options to configure what is printed on the report.

FTP – You can send the **PedCath** report in any file format via the File Transfer Protocol. This can be done both manually and automatically when a report is saved or locked. When configuring the FTP setup, you have the option to strip patient identifying data if the files are to be exported outside of your organization. SFTP is also supported (over SSH-2) and is recommended when sending data with patient identifying information to outside of your institution.

Email – We support any MAPI-enabled mail client and will load your default mail client with the **PedCath** PDF report as a mail attachment.

Supported File Formats

HTML (.htm) – **PedCath** can generate the report as a hypertext document that can be displayed within any web browser.

TEXT (.txt) – **PedCath** can export the report to a simple ASCII-format text file for simple parsing or backup.

PDF (.pdf) – **PedCath** also supports Adobe's PDF document format. Files of this type have the advantage that they cannot be altered and preserve the original page layout when printed or viewed on different platforms. The PDF export has many configuration options that can be set during the report setup. This is the format **PedCath** uses for printing.

Optional Formats

XML/XSL (.xml / .xsl) – **PedCath** can write the report data in XML format, which is becoming the standard for data exchange between systems. We also export an XML stylesheet file (XSL) that presents the XML data in a web page format. If our PDF document or our XSL style sheet does not suit your needs for the printed report, your organization can develop its own XSL file to define the presentation of the XML data.

<http://www.w3.org/Style/XSL/>

Version 1 of the XML export will include the XSL style template, however versions 2 and above do not because they are written primarily for data exchange with EMR systems. The later versions are more inclusive of the report data. You can configure which version to use in the export administrative options.

HL7 – PedCath can write the report in the industry standard Health Level 7 format.(v2.3.1).

Manual and Automatic Export

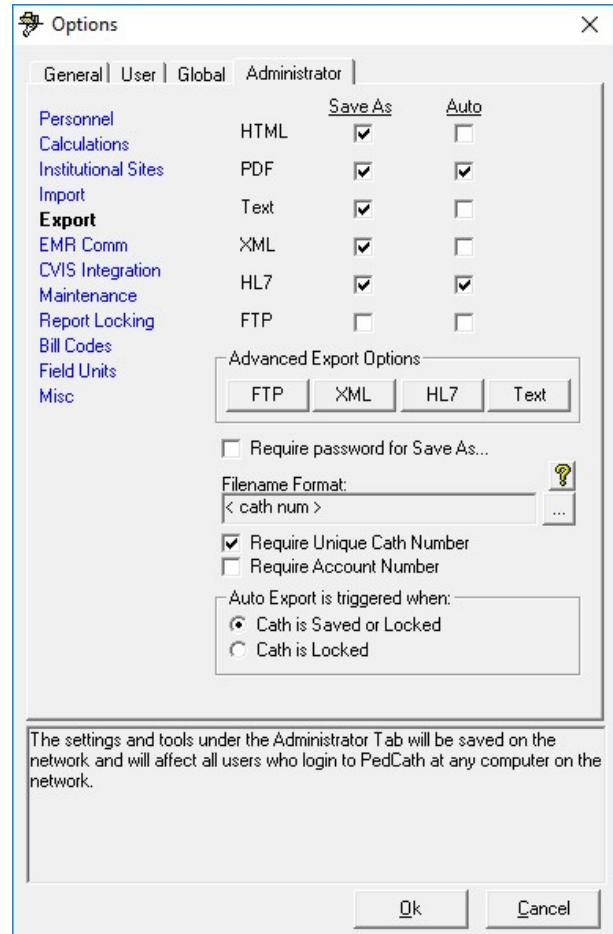
PedCath allows you to configure which exports **PedCath** users may export manually and which ones will be automatically exported when the cath report is either locked or saved.

For manual exports you can also force the user to enter their user name and password before they can export.


For automatic exports the default path is set to the *export* folder within the **PedCath** network directory. Each user has the choice to use the default path or set it to a different location. That is set on the General tab, and can set globally there as well.

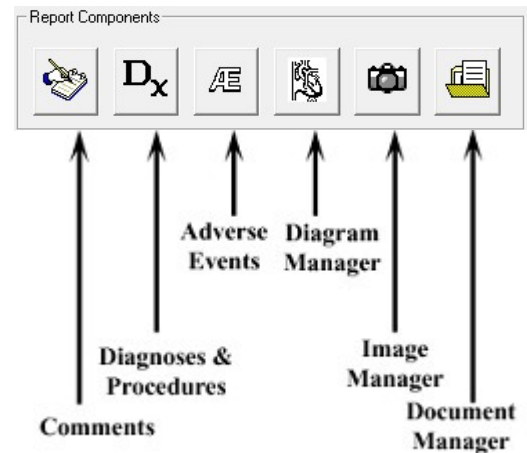
You can also define the file name format for the automatic exports by combining fields such as the MRN and cath number.

There are configuration options for several of the file types to configure the content and resources that are included, header information, etc., within the Advanced Export Options.




Cath Report Component Managers


 **The six buttons (shown at right) launch (left to right) the comments, diagnoses and procedures, adverse events, and the diagram, image, and document managers.**



Comments

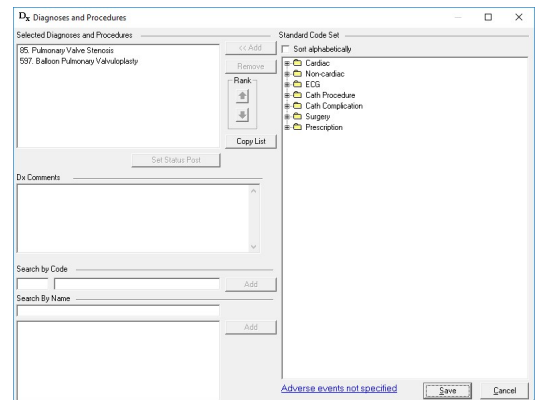
 Comments may be edited by selecting the comments button on the toolbar, pressing F2, or selecting “Comments...” from the view menu. This is the best place for short notes. For longer commentary, entire documents may be added to the report.

Diagnoses and Procedures


 The diagnoses coding screen may be activated by selecting the Dx button on the toolbar, pressing Ctrl+D, or selecting Diagnosis and Procedures from the tools menu.

To add a code, you may either browse through the Code Set box or use a search facility.

In the Code Set box, expand the folder list by either double clicking on a folder or clicking on the + sign to the left of the folder you wish to open. Select a code by clicking on it. To see the full name of long descriptions, use the scroll bar at the bottom or leave the mouse over a description for a few seconds; in the latter case, the full name will appear momentarily. To add a code to the cath, use either the Add button or double click on the code.




To add a code via the Search for Code box, enter a code in the small text box on the left. If this box matches a code exactly, the code is displayed in the text box immediately to the right. Click Add to add this code to the cath. Notice the Copy List button to the right of the Selected Diagnoses and Procedures list. This will allow pasting of the selections under Comments or into another document.

 **You can add a code via the Search by Name box. Just enter a part of the name of the code for which you are searching.** For example, entering *stra*, the selection box will list all diagnoses that contain the letters “stra” in order, such as “00105. Stradling mitral valve,” and “00106. Stradling tricuspid valve.”

Select Dx. codes by double clicking or highlighting and pressing the Add button.

You may remove a patient’s Dx. codes by highlighting them, then clicking the Remove button.

 **You can change the position (order of importance) of a selected code by highlighting it and then clicking the up and down arrows in the Rank box to the right.**

Click the “Set Status Post” button to mark a procedure as status post. Procedures imported from earlier cases will automatically be set to status post. This option is not available for all coding sets.

Adverse Events (Optional)

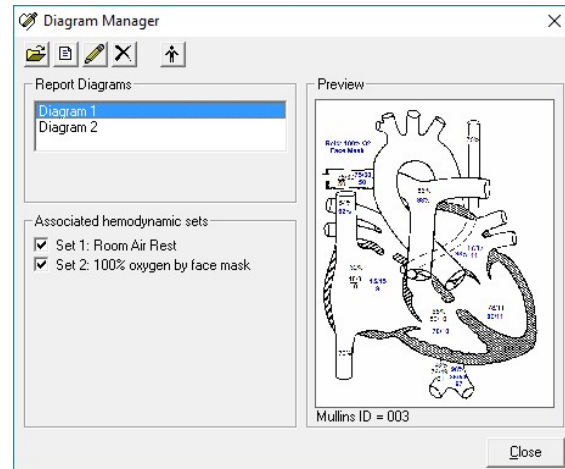
Adverse Events is an optional button. If activated, this button will open the Adverse Events screen. This will present the Adverse Events code list and relevant qualifiers.

Diagram Manager



To access the diagram manager, press F6, select “Diagram Manager...” from the Report menu, or click on the Diagram Manager button in the upper right of the edit screen.

In the Report Diagrams selection box in the upper left of this window, you may select the diagram you wish to view. A preview will appear on the right. Each diagram may be associated with between zero and four hemodynamic sets. Click the check boxes of the hemo sets which you would like to associate with each diagram. To remove a diagram, click the button marked with an “X.” To add a new diagram, click on the Add Diagram button, the button marked with a folder on the far left of the toolbar.

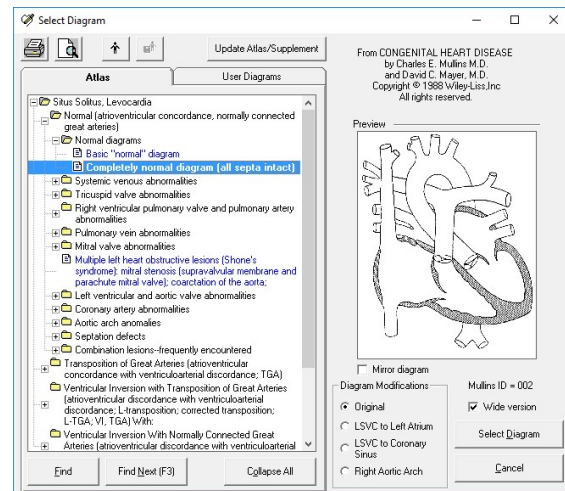


Adding Diagrams

To add a diagram, expand the folder list by either double-clicking on a folder or clicking on the + sign to the left of the folder you wish to open. Select a heart description by clicking on it; a small preview will appear on the right.

For most of the original diagrams there are variations available (such as adding an LSVC to the Left Atrium, LSVC to the Coronary Sinus, or Right Aortic Arch). To choose a variation, select one of the choices within the Diagram Modifications group. You can also choose to use a wider version of a diagram that shows expanded pulmonary arteries, by clicking the **Wide version** box. The Mirror diagram box will flip the diagram horizontally for Dextrocardia patients.

*(Note: If the diagram modifications are greyed out, you may be missing the new diagrams. Click the **Update Atlas/Supplement** button to install the latest diagrams from the web or from a PedCath CD).*



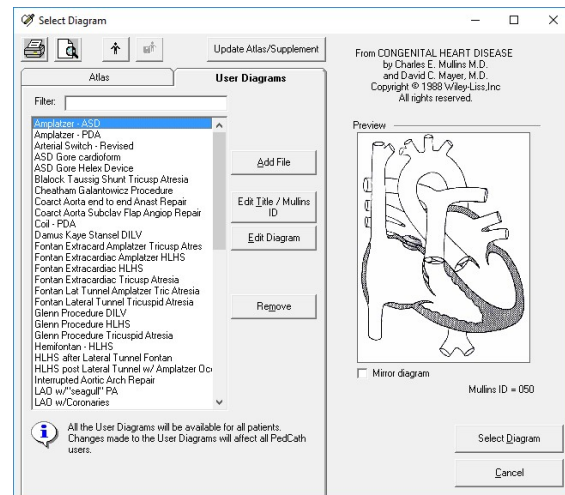
Once you have chosen the diagram that best matches the patient, click the Select Diagram button at the bottom of the form, and the diagram will be added to the cath.

On the Other Diagrams tab you can create an additional atlas of diagrams for your institution. You can add diagrams to the User Atlas from a file or from the current patient's template.



To add the patient's template to the User Atlas, click the Load Template button and then the Add Template to Atlas button.

To load the template directly to the cath report, click the Load Template button and then the Select Diagram button. Adding the template to the cath report can also be done directly from the Diagram Manager screen.




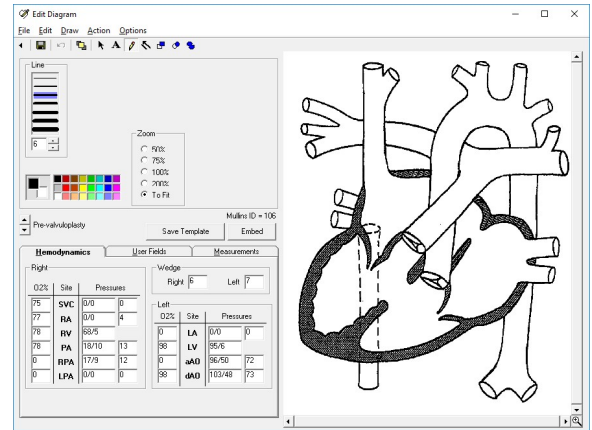
We provide an atlas of supplemental diagrams preloaded into the user atlas, that includes surgical and device implantation diagrams. (You can see if your supplement is up to date by running the **Update Atlas/Supplement** module).

Editing Diagrams

To edit a diagram, click on the pencil icon in the toolbar in the diagram manager or double click on the diagram you want to edit. This will activate the drawing screen.

The **PedCath** drawing program is specially designed to help you produce anatomical diagrams for your cath reports. The drawing tools are easy to use, and should look familiar to anyone who has used other Windows drawing programs. Hemodynamic data appears in a table next to the picture, allowing you to drag numeric values directly to the diagram.

 **If you make extensive changes to the patient diagram, you may wish to save the diagram as a template by clicking the Save Template button. This option will save this diagram for this patient, allowing it to be recalled in the future. Each patient may have only one template.**



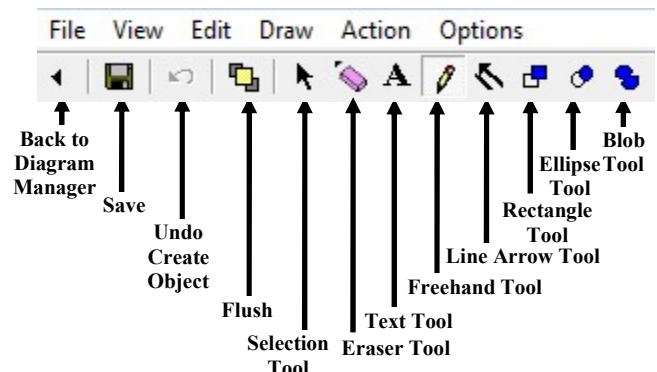
Embed

Embedding Hemodynamic Values in the Diagram

You may automatically embed all hemodynamic values from the data grid to the diagram. Values embedded in this way will appear at the appropriate places in the anatomy image, and will use the same automatic formatting features as when the same values are manually inserted. The Undo feature does not apply to embedded data; however, you may cancel an embed operation by closing the edit diagram screen without saving.

Edit Diagram Toolbar

The Edit Diagram toolbar contains options for adding various elements to a patient's diagram: hemodynamic data and other text, as well as arrows, lines and shapes. Each element that you add to the diagram is called an object. Use one of the six drawing tools to add or edit objects on the diagram. Each of the tools has specific options, which are displayed below the toolbar.



Undo Create Object

Click this icon to undo the last drawing operation.



Flush

After you have added drawn objects to the diagram, they can be moved or edited individually until you either save the diagram or press the flush button. Although flushing does not save the diagram to the patient's cath record, flushing the objects in the diagram makes them part of the diagram bitmap; they no longer exist as separate, editable elements. After an object has become part of the drawing, you can modify that object only by drawing over it.



Selection Tool

Use the selection pointer to select objects for editing or deletion. Only objects added to the diagram in the current editing session may be selected. After you have clicked the selection tool, the mouse pointer will change to a bull's eye when it is over a selectable object. Click in the drawing on any object. A box will appear around it indicating that you may use one of the drawing tools to change it, or drag it to a new position on the diagram. To delete a selected object, press the Delete key. You may also select an object by right clicking on it with the mouse, even if you have not previously chosen the Selection Tool.



Text Tool

Choosing the text tool shows a text box where you may enter a string of characters to be placed on the

diagram. Select a font and other formatting options, and then click on the diagram where you want the text to appear. If you click on any value in the hemodynamics tab, that figure will appear in the text box. You may format it as you would any text, and click on the diagram at the appropriate location. You may also pre-set the formatting options, and drag numbers onto the diagram with the mouse. Automatic formatting, such as the bar over mean values, will override your formatting when you use the drag and drop method.



Eraser Tool

Erase parts of the diagram with a freehand eraser. Set the eraser thickness, and then drag the mouse on the diagram while holding down the left button.



Freehand Tool

Draw freehand lines and shapes using the freehand tool. Set the line color and thickness, and then drag the mouse on the diagram while holding down the left button.



Drawing with any tool in white works as an eraser.



Line Arrow Tool

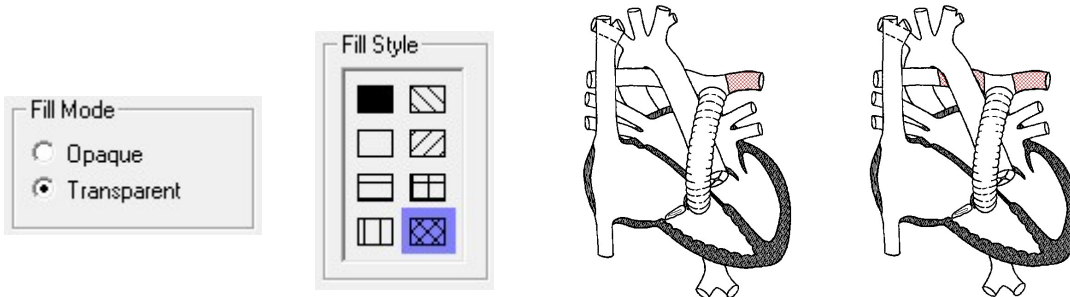
Draw straight lines and arrows with the line tool. To draw a line, click at a starting position on the diagram and hold the mouse button down while you drag to the point where you want the line to end. Release the button to place the line on the diagram. Arrows are useful for indicating the catheter course. Select a size for the arrow's head, and draw a line. You may place the arrowhead at the beginning or the end of the line.



Rectangle, Ellipse, and Blob Tools

Use one of the three shape tools to draw enclosed shapes on the diagram: (left to right) rectangles, ovals, or irregular shapes (blobs). For each of these shapes, set a Line Color for the outline, and a fill color for the enclosed, inside area. You may also select a fill pattern; for non-solid patterns, the transparent option will allow the diagram beneath your shape object to show through.

Tip: The blob tool is useful for drawing in stents by tracing an outline of each stent along the walls of an artery. Try using a diagonal crisscross Fill Style, and a transparent Fill Mode.



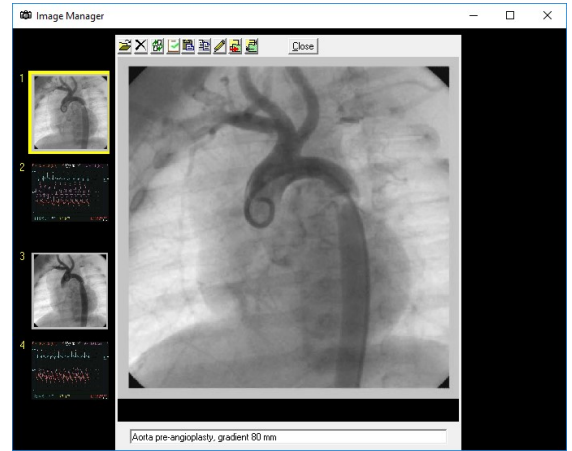
If you are working on a complicated diagram we recommend saving often. You can set up a Save Reminder in the Options menu within the Diagram Editor.



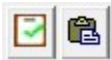
Image Manager

To activate the Image Manager, click on the camera icon in the *Report Component Manages* window. You can also launch the Image Manager by pressing F7 or selecting “Image Manager...” from the Report menu.

The image manager allows you to add images and captions to the cath record. To add an image, click on the folder icon in the image manager. A window will pop up allowing you to find and select an image to attach. A caption may be entered in the text box along the bottom of the image. To remove an image, click on the button with an “X,” just to the right of the Add Image button. When multiple images are associated with a cath, previews of the images are displayed along the left and right margins of the image manager window. To view an image in a larger size, click once on it, and the yellow cursor will surround the preview of the image.



To swap two images, click on one of the two images you would like to switch. Click on the third button from the left, and, following the on-screen instructions, click on the second image you would like to swap.



You can copy the currently selected image to the Windows clipboard, or paste an image from the clipboard into the Image Manager.



Click this button to add a duplicate copy of the selected image to the Image Manager.



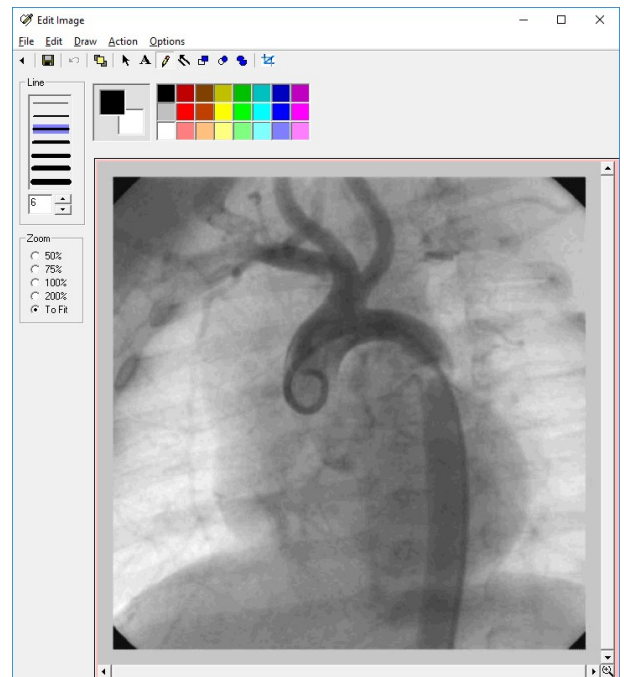
These options will allow you to shrink the resolution or change the format of images currently in the database, or set up to have image modifications applied automatically during imports. This can be helpful to conserve disk space.



To edit an image select it within the Image Manager Window and click the Edit Image button. The Image Editor (shown right) allows you to draw lines, shapes and text similar to how it is done in the in the Diagram Editor (see previous section for more details).



A crop tool is also available to zoom into a particular area of the image for greater detail. To crop an image click the crop button and draw a rectangle over the part of the image you would like to keep on the pop-up dialog. Once an image is cropped it cannot be reverted to the original so it's recommended to make a copy of the original image within the Image Manager to work from if you plan to crop it.



PedCath will allow you to select which images appear on the cath report on the Report Setup dialog (see the **Report Setup** section, page 26). The report image selections will be retained for each cath report.

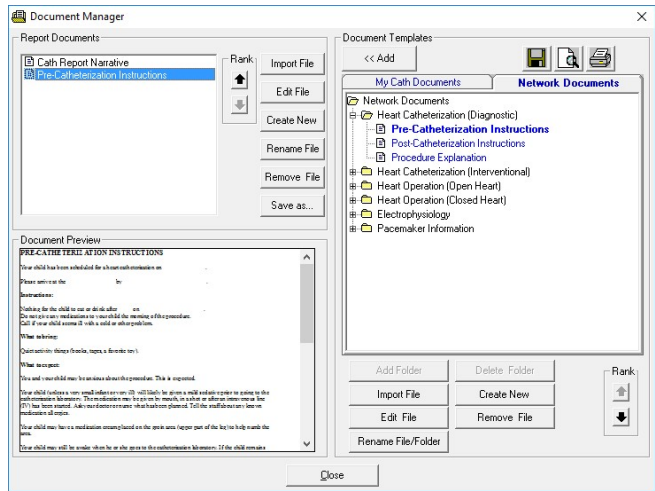


Document Manager

To show the document manager, press F8, select “Document Manager...” from the support menu, or click the Document Manager button from the upper right corner of the edit window.

The Document Manager enables you to import existing documents into the report or create new ones. You may also open, modify, and delete documents using the Document Manager.

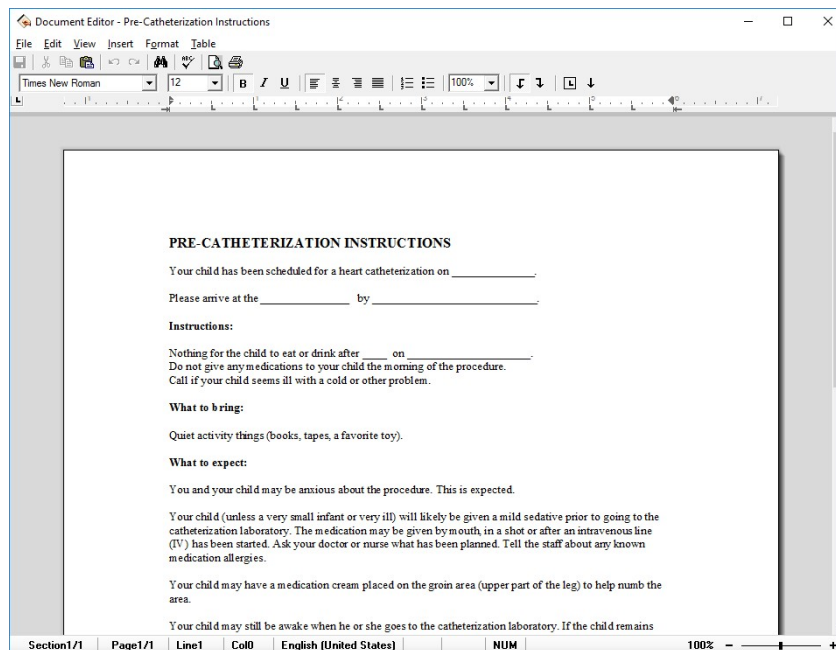
When you click Import File, you may browse and select the document you wish to import. You may import documents in the following formats: *.rtf, *.txt, *.doc, *.htm, and *.html. PDF files are also supported for import, but as read-only documents.



Clicking Create New Document will open the Document Editor (below), which allows you to create documents containing tables and images.

There is a preview of the document that is currently selected in the lower left window. You can edit an existing document by clicking this window or by clicking the Edit File button.

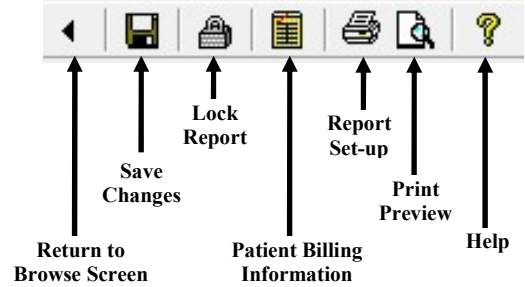
The Document Manager also allows your institution to keep an archive of Document Templates to pull related documents into the cath report. The documents listed within the My Cath Documents tab can be seen only by you, and those listed under Network Documents can be seen by all PedCath users. We provide over 20 documents for the institutional document archive to get you started. PedCath administrators can modify the hospital-wide archive.



The document editor is also linked to the cath report resources and will allow you to easily insert them within the document, including cath diagrams, images and other documents from the My Cath or Network Documents templates. Those can be added from the Insert menu.

Edit Cath Report Screen Toolbar

The six icons on the toolbar in the upper left of the Cath Report Screen (left to right) return to the Browse Screen, save changes, launch patient billing information, launch the report set-up, provide a print preview, and open help information.



Billing Information



To access patient billing information, press Ctrl+B, click the Patient Billing Information button on the toolbar, or select “Patient Billing Information” from the tools menu.

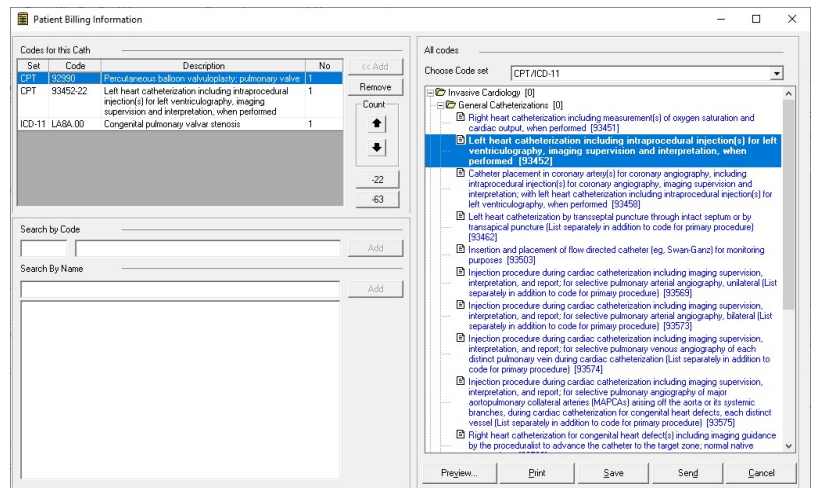
To add a code, you may either browse through the All codes box or use a search facility.

In the All codes box, expand the folder list by either double clicking on a folder or clicking on the + sign to the left of the folder you wish to open. Select a code by clicking on it. To add a code to the cath, use either the add button or double click on the code. If a code is added to the active cath through these methods or the others discussed below, it will be displayed as bold in the All codes box.

To add a code via the Search by Code box, enter a code in the small text box on the left. If this box matches a code exactly, the code is displayed in the text box immediately to the right. Click Add to add this code to the cath.

To add a code via the Search by Name box, enter a part of the name of the code for which you are searching. Select the code that you wish from the results to add and press the Add button.

In the “Codes for this Cath” box, you may change the number field by clicking the up and down arrows in the Count box to the right. You may also remove codes by clicking the remove button.



To add the -22 modifier to a billing item, select it and click the “-22” toggle button.

To add the -63 modifier to a billing item indicating a patient less than 4 kg, select it and click the “-63” toggle button.

Procedural (CPT) and Diagnosis (ICD-9, ICD-10, or ICD-11) codes are included in the All codes listing. Administrative options are available to specify which sets are available. If multiple sets are available the set being used is displayed above the All codes list, and can be changed using the pull-down combo box.

Once the codes are added, PedCath will allow you to print a billing sheet or email it as a PDF file (“Send” button).

Locking the Cath Report



PedCath has the ability to lock the cath report so that no edits can be made. To lock the cath report, click the padlock toolbar button or choose “Lock Cath Report” from the File menu (shortcut Ctrl+L). In order to lock a cath you must be a staff member listed on the cath report with a role with lock privileges (Attending’s only by default). Administrators can set the roles able to lock a cath report by choosing “Tools” > “Options...” from the Browse screen and clicking the Global tab.

The staff member who locks the report is essentially saying the report is complete and thus signs off on it. The report printout will specify that this staff member signed the report.

Administrators can decide whether PedCath users can print preliminary reports and if so the text that will be printed on it to indicate that it is unsigned. To configure this option “Tools” > “Options...” > “Administrator” and click the “Report Locking” link.

Auto-export can be configured to trigger either when the cath is saved or when it is locked (default).

Unlocking and Creating Updated Reports

To make any modifications after a report has been locked, staff members who have rights to lock a report also have the ability to unlock them or to create an updated report. To unlock the report choose “File” > “Unlock Cath Report” from the menu. After 24 hours this menu item will not be available, and you will need to create an updated report to make changes. Creating an updated report will make a full backup of the original data and resources, before allowing you to make any changes. To create an updated report choose “File” > “Create Updated Report” from the menu.

If PedCath has been configured to automatically send reports to the EMR, it's recommended to always use the "Create Update Report" command rather than "Unlock Cath Report" to make changes even if you are within the grace period. For this scenario the "Unlock Cath Report" command should only be used to fix issues with and resend a final report that was initially rejected by the EMR.

You can make as many updated reports as necessary and older updated reports or the original report can be viewed from the “View Backup Cath Report” item on the “File” menu. If you print an older report there will be a message on the printout saying that a newer report is available.

If the report you are editing or viewing is an updated report, a message will be shown in the status bar and a message will be printed on the report saying so.

HL7 Acknowledgements

If your institution is sending reports to the EMR through HL7 and has HL7 acknowledgement processing turned on, PedCath can automatically unlock reports if there are negative acknowledgements received that indicate a filing issue. If this happens, the staff member who locked the case will be notified of the issue and that the case has been unlocked. This automatic unlocking will ignore the standard grace period but will rather use a timeout period if it's configured.

Server Time

There is an administrative setting to query the server time when locking and unlocking cath reports rather than using the local system time. While there are some checks in place to prevent local date tampering normally, querying the server time should always prevent date tampering while also making the timestamps more accurate and consistent (it's also possible that a user is working remotely in a different time zone in which case the server time would be preferable). This option can be set in the Report Locking section of the Administrative Options. Any Windows system can be used for the time server; it doesn't have to be the same as the PedCath data share.

Lock Reminder

There is a per-user setting that will show a lock reminder after changes have been made to a cath report and saved. At least 1 diagram must exist and 1 set of hemodynamics before the reminder is shown. The setting can be turned on in the Options on the User tab.

Report Setup



To setup, preview, and print a cath report, press Ctrl+R, click the Report Setup button on the toolbar, or select “Report Setup...” from the Report menu. Reports can also be printed from the Browse screen in the same manner.

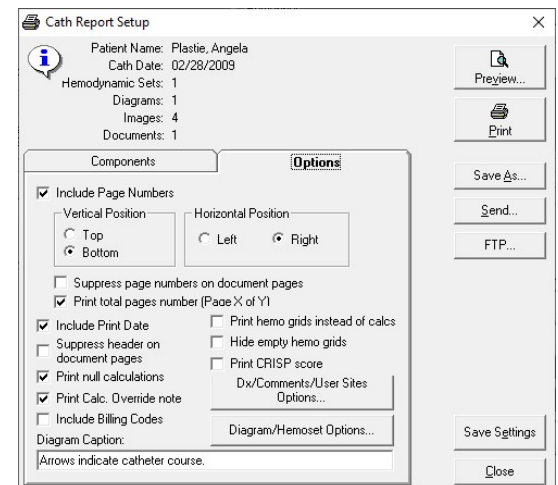
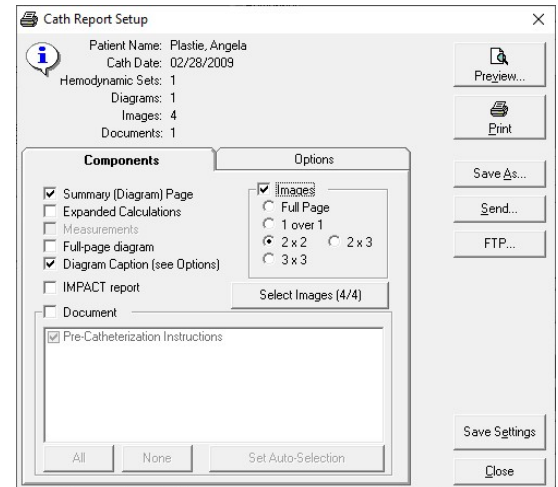
On the Components tab select the items you wish to include in the report. A check box is grayed if the associated cath component is not available for the current cath report. For instance, if there are no images, the Images check box is grayed; if you do not check the Documents check box in the Components box, each individual document’s check box will be grayed in the Documents box.

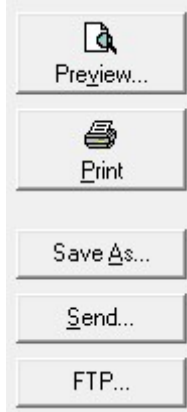
In the Images box, you may select the layout of the images. Clicking the **Select Images** button will allow you to choose which images to include in the report, and optionally retain those choices for future printouts.

On the Options tab you can select many report setup options such as the page number location, the caption to be used for diagrams, if any, as well as the ability to hide null calculations or blank grids, or replace the calculation block with the hemoset grids (if more than one hemoset is shown on the page). The CRISP score can also be included on the report if calculated.

By clicking the “Diagram/Hemoset Options...” button you can specify which diagrams are to be printed and if summaries of all associated hemosets will be printed on each summary page or just one expanded set.

The “Dx/Comments/User Sites Options...” will give you control over inclusion and positioning of the diagnoses, diagnoses’ comments, and cath comments. You can choose to roll the cath comments to the second page for instance, or choose to print the Dx comments rather than the Dx procedure list.

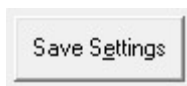




You may preview your report by clicking the Preview button.

When you are satisfied with the appearance and content of your cath report, press the Print Button and select the number of copies you wish to print.

You may also save the report in one of several formats; including ASCII, HTML, PDF, XML, or HL7. The PDF file will look the same as the printed report and uses the options set from the report setup. You can also email the PDF report by clicking the ‘Send...’ button, or manually send the report via one of the FTP profiles set by your institution.



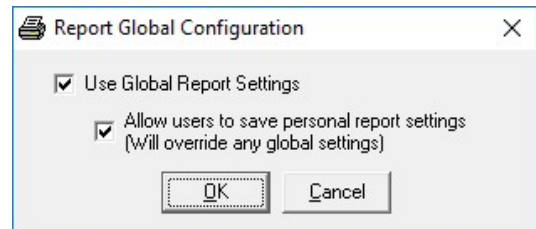
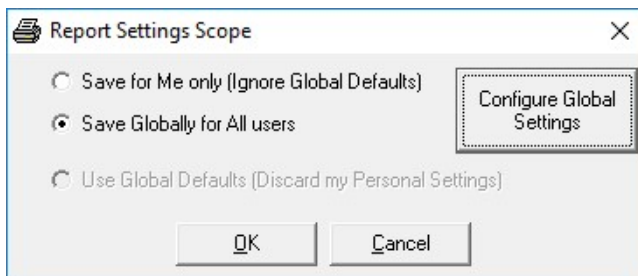
You may optionally save your report settings so that the next time you go to print a report the settings will load the same way. The settings can also be saved globally for all users.

Global Report Settings

If you are a PedCath administrator clicking Save Settings will allow you to make the active report settings global for all users. This will achieve a consistent layout for cath reports generated across workstations.

To enable global report settings click “Configure Global Settings” and check “Use Global Report Settings”. To allow users to override the global defaults also check “Allow users to save personal report settings”.

To save the currently selected report setup (report components included and other options), select Save Globally for All users on the Report Settings Scope dialog and click OK.



The global settings will be used whenever the report is printed as well as for any auto-exports set up.

Users will always be able to alter the report sections included and options for any individual report when printing, no matter if global settings are used or not.

Data Reports

PedCath includes a data reporting tool that can be used to create reports based on criteria (query items) specified for your cath database. For example, a report could display all the cathes where the patient was less than 7 days old, or list all the patients with Tetralogy of Fallot where Dr. Everett was the attending physician. Once the report query is run, the report will be created as a PDF document that can be printed, saved, or emailed.

The Data Reports module has been rewritten in version 8.1. New features include a user interface overhaul, expanded data fields (including hemodynamics and IMPACT Registry data), and the ability to load the query results into the **PedCath** Browse screen.

Creating a Report Query

On the **PedCath** main screen (Browse screen), click the Tools menu and choose “Data Reports...” The “Data Reports” dialog will be displayed. Criteria may be entered here to filter for the desired records.

Data Reports

Search: By Cath By Patient Find:

Patient Demographics

- First Name
- Last Name
- Middle Name
- SSN
- SSN Not Available
- Race
- MRN
- Birth Date

Hemodynamic Data

- Number of Hemosets
- +Pick Hemoset

Cath Data

- Cath Date
- Cath Start Time
- Cath End Date
- Cath End Time
- Procedure Time (min)
- Age at Cath
- Staff
 - Administrator
 - Allen D. Everett, MD
 - Dr. Kymberly Shackelford
 - Hammill MD, William
 - Heller MD, Felice
 - Matherne MD, Paul
 - Peter D. Jacobs, MD
 - Renee Friday, MD
 - Sara E. Regan, MD
 - W. Fletcher Lane, MBBS
- Dx (Standard Code Set)
- Billing Codes
- Adverse Events
- Cath Number
- Cath ID (Internal)

Registry Data

- Episode of Care
- Clinical Evaluation Leading to the Procedure
- Procedure Information
- Hemodynamics
- Procedures Performed
- Intra And Post-Procedure Events
- Discharge
- Followups
- IMPACT Version Number
- IMPACT Report Status

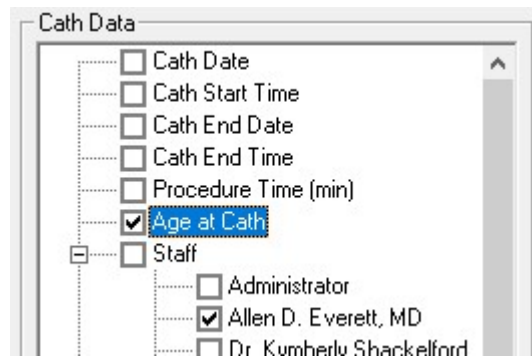
Query Summary

- Age at Cath Is Less Than "3" Months
- Allen D. Everett, MD Is "Attending"

Let's say we want to create a query for all cath records for patients less than 3 months old where Dr. Everett is the attending physician.

In this case we would need to create two query items – one for Dr. Everett being the attending physician and the other specifying the age to be less than 3 months.

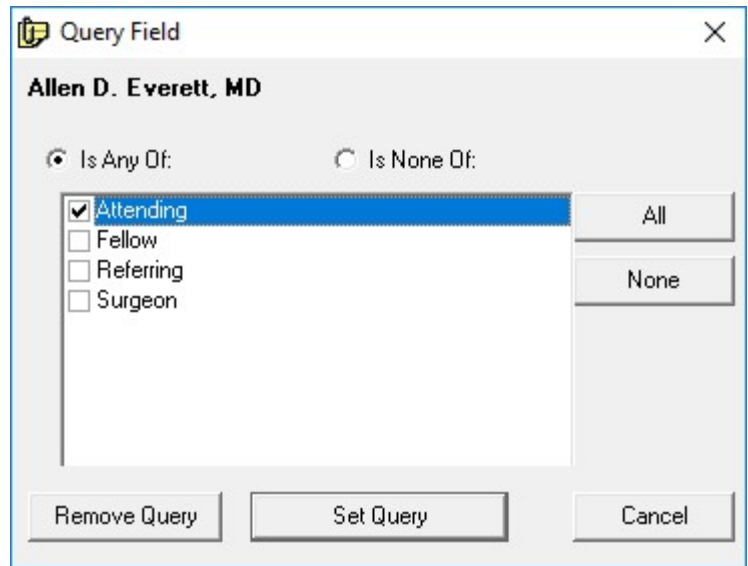
To do this expand the Staff entry tree group in the Cath Data tree by clicking the + next to it and check off “Allen D. Everett, MD”.



The Query Field pop-up will be displayed.

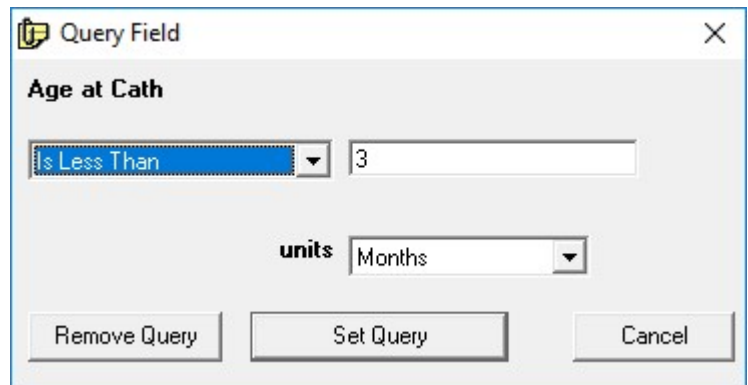
Leave the query type set to “Is Any Of:” and check “Attending”

Click Set Query to confirm the query.



The query item will be added to the Query Summary area at the bottom of the screen.

To add the query based on the Age at Cath, check the “Age at Cath” item in the Cath Data grid. Choose “Is Less Than” as the query criteria, enter “3” in the text box, and select “Months” from the units drop-down box. Click “Set Query”, and the query item will be added to the Query Summary.



You can edit a query item's criteria, by double-clicking the field name the query trees (and not the check box) or by highlighting the item within the Query Summary area and clicking the Pencil icon (or by double-clicking the query item).



You can delete a query item by unchecking the box next to the field name in the query trees, or by highlighting the item in the Query summary and clicking the X button (or the pressing the Delete key).

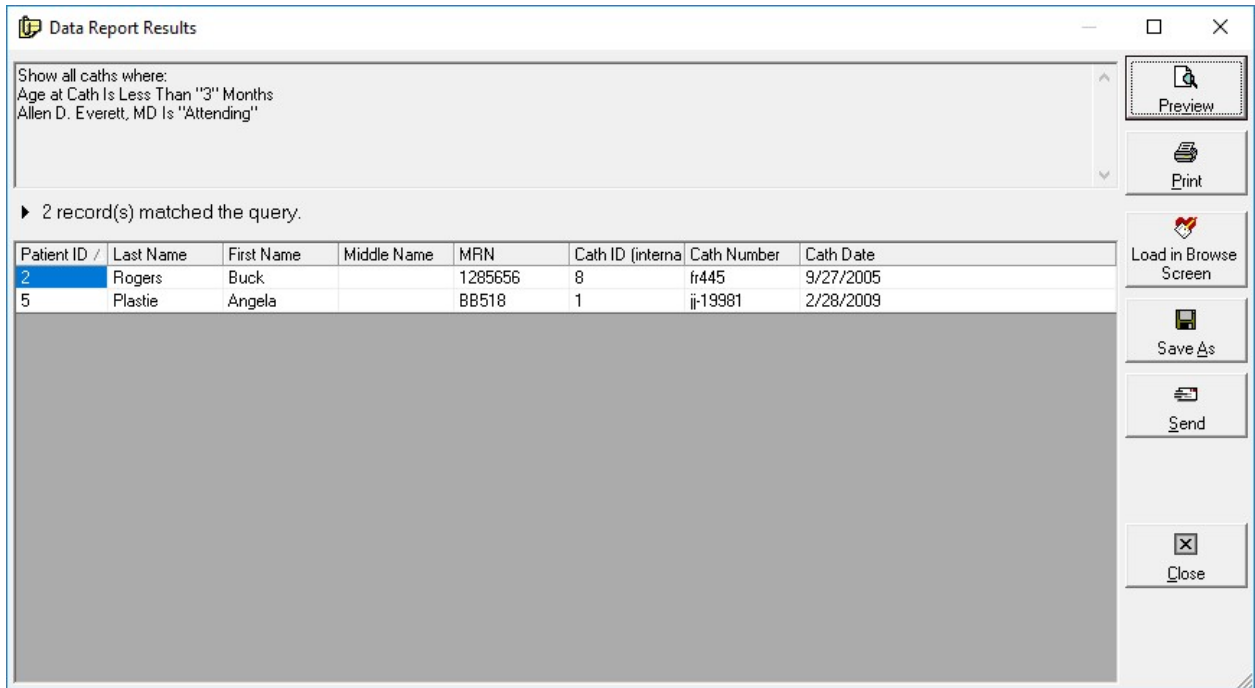
Note: A query can be saved for future use by clicking the Save button, and a previously saved query can be loaded by clicking Load and finding the query file (p8q extension). Please note this file contains the query items and report setup but does not contain the results of running the report.

Running the Report Query

Make sure to specify if you are searching “By Cath” or “By Patient”. If searching by Patient, the results will show a list of Patients who have at least one cath that matches the query.

From the “Data Reports” dialog, click the big “Run” button to run the report query. Processing times can vary depending on the size of the cath database, complexity of the query, and speed of the network.

If we run the query entered in the previous sections on the sample data set, 2 cath records are returned as shown in the figure below.



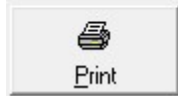
The screenshot shows a window titled "Data Report Results" with search criteria: "Show all cath(s) where: Age at Cath Is Less Than '3' Months" and "Allen D. Everett, MD Is 'Attending'". Below the criteria, it states "2 record(s) matched the query." and displays a table with the following data:

Patient ID /	Last Name	First Name	Middle Name	MRN	Cath ID (internal)	Cath Number	Cath Date
2	Rogers	Buck		1285656	8	fr445	9/27/2005
5	Plastie	Angela		BB518	1	ij-19981	2/28/2009

On the right side of the window, there are several buttons: Preview, Print, Load in Browse Screen, Save As, Send, and Close.

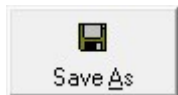


Preview



Print

Clicking the Preview or Print button will allow you to view/print the results report. You can order results rows by clicking on one of the column headers (click a header multiple times to toggle between ascending and descending order). The printed report will be in the same order.



Save As

Clicking the Save As button will allow you to save the report in .CSV format, which can be opened and further processed in Excel or other spreadsheet programs. By default the fields shown in the grid will be included in the .CSV file, but you will be given the option to include additional patient, cath, and staff fields. Additional processing will be required to search the database for the additional data.



Clicking the Load in Browse Screen button will open the Browse screen showing only the patients returned in the query results. Here you will be able to further inspect any of the cases returned by the query, and make any changes to any cath reports if necessary. If you did a Search By Cath, then only the patient’s caths that matched the query will be shown in the Cath grid. To view all of a patient’s cases whether they matched the query or not, check the “Show All Caths” box.

Viewing by cath (View > By Cath) is supported while in query mode, but viewing by staff is not.

The screenshot shows the PedCath software interface. At the top, there is a menu bar with 'File', 'Edit', 'View', 'Tools', 'IMPACT Registry', and 'Help'. Below the menu is a toolbar with various icons. The main window is titled 'Showing Query Results' and has a yellow header bar with a 'Show All Caths' checkbox, 'View Query', and 'Edit Query' buttons. The interface is divided into several sections:

- Patient List:** A table with columns 'ID', 'Name /', and 'MRN'. It shows two patients: ID 5 (Plastie, Angela, MRN 88518) and ID 2 (Rogers, Buck, MRN 1285656).
- Cath List:** A table with columns 'IR', 'Cath Date', and 'Cath No.'. It shows one cath: IR 02/28/2009, Cath No. jp19981.
- Staff List:** A table with columns 'Staff Name' and 'Role'. It shows two staff members: Allen D. Everett, MD (Attending) and Renee Friday, MD (Fellow).
- Buttons:** 'Find', 'Add Patient', 'Edit Patient', 'IR', 'Add Cath', 'Edit Cath', and 'Personnel Record'.
- Diagrams:** A section titled 'Diagrams' showing 'Diagram 1 of 1'. It contains a diagram of a heart with catheters and text: 'pre-angio gradient 80 mm Hg', 'post-angio gradient 15 mm Hg', '136/44', '88', 'post angioplasty 97/49', '99%', 'pre-angioplasty 56/43', and 'post angioplasty 82/46'.
- Calculations:** A section titled 'Calculations' showing 'Set 1 of 1: Pre-Angioplasty' and a list of variables: Qp =, Qs =, Rp =, Rs =, Qp/Qs =, Rp/Rs =, Qep =.
- Comments:** A section titled 'Comments' containing text: 'Coarctation of the aorta s/p subclavian flap repair with re-coarctation S/P balloon angioplasty with 6 and then 8 mm balloon. The stenosis measured 2mm, the transverse arch 6.5 mm and the descending aorta 7.75 mm Initial AAO to DAO gradient 80 mmHG, post andioplasty 15 mmHG'.
- Diagnoses / Procedures:** A section titled 'Diagnoses / Procedures' containing text: '568. Balloon angioplasty A0', '672. Coarctation repair, SF'.
- Diagnosis / Procedure Comments:** A section titled 'Diagnosis / Procedure Comments' which is currently empty.

You can make modifications to the query by clicking the Edit Query button.

Click the X on the right side of the yellow header bar to close the Query Results View and show all of the PedCath patients.

Administrative Console

The Administrative Console is a separate application from PedCath that contains many administrative features such as viewing login information, viewing access log information (HIPAA logging), running database maintenance and modifying the staff database.

You can start the Administrative Console from the start menu or within PedCath.

To start from Windows:

Start >> Programs >> PedCath >> Administrative Console
You will need to enter your PedCath initials and password to log in.

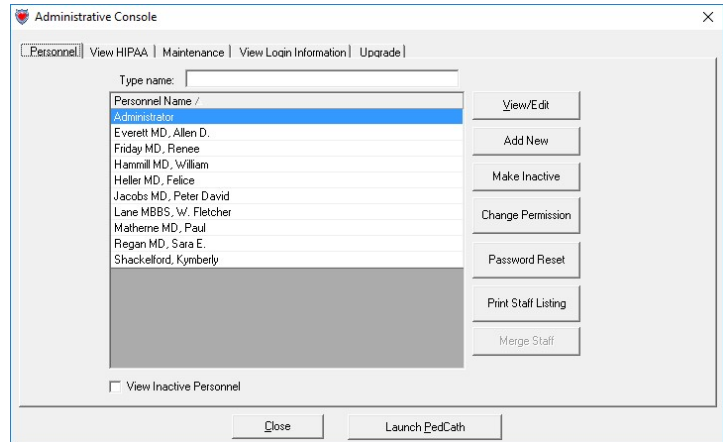
To start from within PedCath:

On the Browse screen choose:
Tools >> Options ... >> Maintenance >> Run Administrative Console
You will be prompted to close PedCath if you plan on running the database maintenance utility.

Editing Personnel

The first tab contains the PedCath staff listing for your organization. Here you can add, remove, and modify staff members. The staff listing may be edited within PedCath as well (see the installation guide for more information on these options).

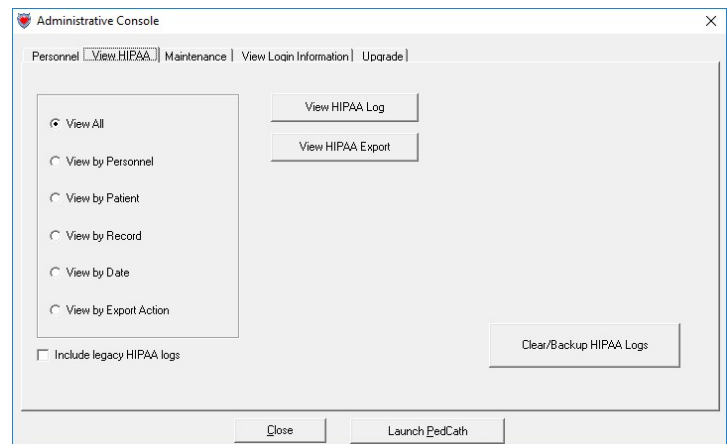
If a staff member contains duplicate records you can merge them here. To do so highlight the record that you'd like to be the master record, click the Merge Staff button, and choose the duplicate entry. Repeat the procedure for additional duplicates. The potential duplicates list only shows staff with the same last name (including disabled records). The Manage Staff button will be greyed out if there are no matches.



Viewing HIPAA Logs

On the second tab you can view HIPAA logging information such as when patients' records were browsed or edited and by whom. This information can be seen by selecting a filtering option and clicking the "View HIPAA Log" button. For instance, to see a listing of when a particular patient's cath information was viewed or edited click the "View by Patient" option and then the View HIPAA Log.

The View HIPAA Export feature works similarly except that it displays information related to exports and cath report locking. The last filter option "View by Export Action" is applicable to this feature and will allow you to search for a particular action type that happened, for instance a listing of all the cath reports printed.



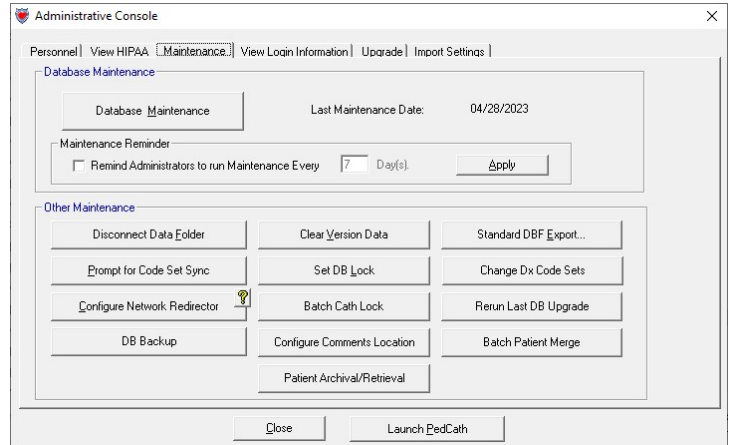
There is also a feature to clear out old entries from the HIPAA tables. The log tables can grow large over time and periodically cleaning those out can speed up PedCath. You can still include the old log entries in your searches by clicking include legacy HIPAA logs. This feature is also available as part of the database maintenance.

Maintenance

The Maintenance table contains many features necessary to maintain the PedCath databases. The most important of these features is the Database Maintenance wizard which is described in the next section.

You can also set up database maintenance reminders within the Scheduled Maintenance grouping.

There are several options beneath the Other Maintenance group. These options are likely to be used rarely but are necessary in certain circumstances.



Disconnect Data Folder – This will remove the pointer to the PedCath database and it will have to be set the next time PedCath or the Administrative Console is run.

Clear Version Data – This will clear the version information from the database making it possible to revert to an earlier version of PedCath.

Standard DBF Export – This will export a snapshot of the PedCath database to a folder in standard DBase format.

Prompt for Code Set Sync – This will cause PedCath to check for code set (Diagnosis/Procedure set and Billing) differences between the “master” set on the network and the sets that are used on the current workstation the next time PedCath is run.

Set DB Lock – This will prevent users from accessing PedCath. This can be used if you are working with the PedCath support team to resolve an issue for instance.

Change Dx Code Sets – This will allow you to change from one diagnostic code set to another, while retaining your old codes. You will only be able to switch codes once while retaining the legacy codes.

Configure Network Redirector – This will allow you to set a database redirector to be used during database migration. All PedCath users who attempt to connect to the current path will be redirected to the new path you specify.

Batch Cath Lock – If your physicians start to use the cath locking feature, you can batch lock the legacy cases with this command. It’s recommended that each attending physician run this command to lock their own cases, and then have an administrator lock the rest.

Rerun Last DB Upgrade – This will set the database version number to the prior version which will force the database upgrade wizard to run the next time PedCath is started. This can be helpful if the database upgrade needs to be run again or if you are reverting to an earlier version through a minor release (not recommended).

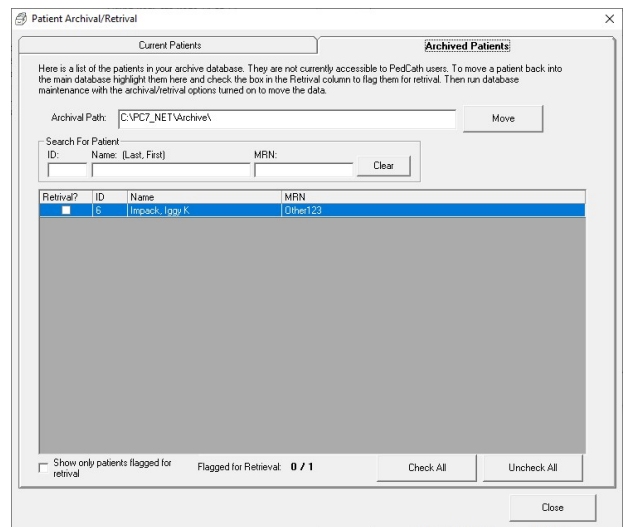
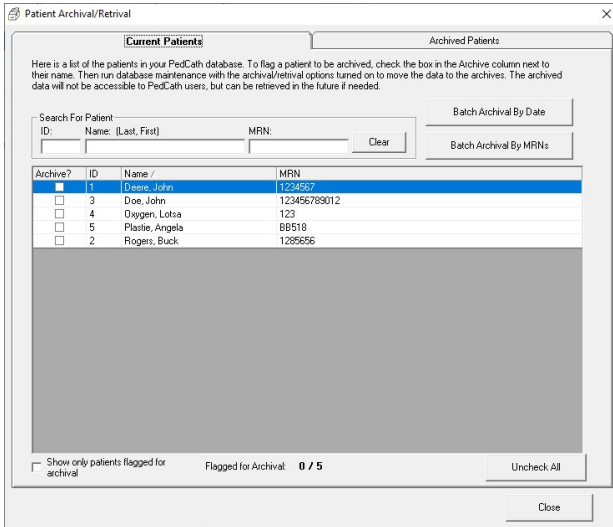
DB Backup – This will allow you to do full or incremental backups of the PedCath database, case resources (diagrams, images, documents), and import files to a folder. You can also manually do a backup of the PedCath files by copying the entire network folder to a backup location.

Configure Comments Location –Your cath report comments and Dx comments are traditionally stored within the database memo file (cathdb.smt). If you have a large number of cases, moving comments to external files can improve performance when loading PedCath and reduce the probability of corruption of the comments.

Batch Patient Merge – This will merge duplicate patient records. If two records have the same MRNs with the only difference being the leading 0s they will be merged.

Patient Archival/Retrieval – This allows you to back up patients who you do not expect to have additional cath procedures for to an external database, which will reduce the size of the database and improve performance. Patients who have been archived will not be shown to PedCath users. This form will allow you to view patients in the PedCath database and flag them for archival. Batch operations are available such as flagging all patients for archival who haven’t had a cath procedure in a specified number of years, or flagging patients using an MRN list. PedCath users can also flag individual patients for archival from the PedCath Browse screen Edit menu.

You can also view all of the patients who have been archived, and flag them for retrieval. You will need to run database maintenance with the appropriate options set to complete the archival/retrieval process. By default the archived database records and files are saved to a sub folder “Archive” of the data folder, but you can move it to another location if desired.

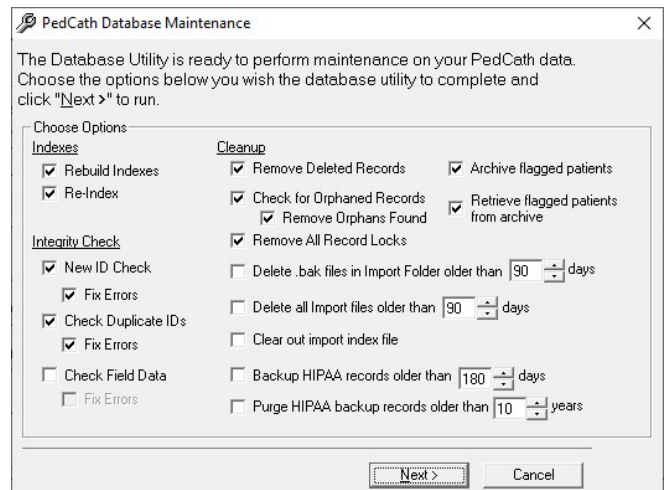


Database Maintenance

The Database Maintenance utility can be used to perform cleanup and integrity checks on your PedCath database. The picture to the right shows the maintenance options available. It is recommended to at least run indexing options which will rebuild the indexes in case they have become corrupted. The Integrity Check is recommended as well and will verify that the ID table is valid. The Check Field Data option will check for invalid field data. Invalid field data can occasionally come from out of range values from your hemodynamic system, and may prevent reports from fully loading. Although unlikely, if you encounter an integrity error contact Scientific Software.

When records are deleted from a dbf table, the records are not actually removed but are rather flagged for deletion. Under the Cleanup group checking the “Remove Deleted Records” option will actually remove all of these entries from these tables which will shrink the table sizes and improve performance.

Checking for orphaned records will tell you if there are any cath records without a corresponding patient or any cath sub-table records without a corresponding cath record. You should rarely find many orphaned records. However, if you find a large number contact Scientific Software for assistance.



Checking “Remove All Record Locks” will remove all dBase internal record locks from the system as well as patient locks. If PedCath locks up when accessing a particular cath or patient record it’s recommended to run this.

The files stored within the PedCath import folder (Data_In\) are files from your hemodynamics system, and are generally not needed after they have been imported. It’s generally good to clean out old files from that folder during maintenance. The files can usually be regenerated from your hemodynamics system if needed. The import index file speeds up loading the import list, since files will not have to be parsed again to determine the patient name and cath date, but it’s good to clean out the table since the entries aren’t needed after files have been imported.

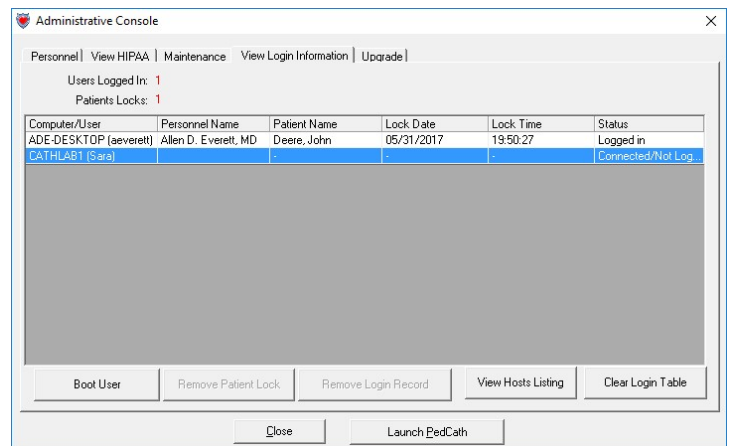
Backing up older HIPAA (user access) logs can also speed up the system by shrinking the active log table. You will still be able to access the backed-up records within the HIPAA viewer.

In order to complete the archival / retrieval of patient records that have been flagged (either in the admin maintenance tools archival module or by PedCath users on the Browse screen edit menu), you would need to check off the options here. When archiving records it’s recommended to also have the Remove Deleted Records option checked which will reduce the size of the database.

Viewing Login Information

The fourth tab allows you to see who’s logged into the system and see what patients are currently being edited.

If you select a staff member and click “Boot User” the user will be prompted to save their work and close PedCath. PedCath will automatically close after a couple of minutes if the workstation is unattended. If the status is stuck as shutdown notify for more than a couple of minutes it could be that PedCath was closed abnormally. If this is the case, click “Remove Login Record” to remove the record. Only use this option to clean up stuck records – if you remove the login record while someone is still connected to the database, their PedCath software will be left open. If you plan on running maintenance or another feature that requires exclusive access, then PedCath would need to be manually shut down where the login record was prematurely cleared.



You can also choose “Remove Patient Lock” which will release the lock on a particular patient so that another user can edit them.

If you are experiencing issues with logins, you can use the Clear Login Table button. All users would need to be closed out of PedCath in order to run this.

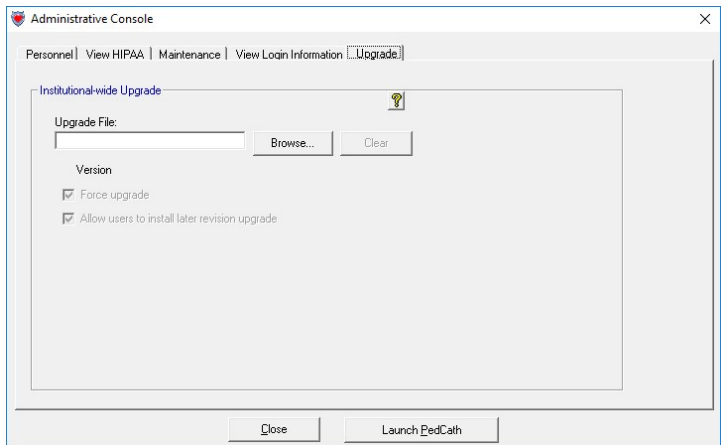
The “View Hosts Listing” command will show you a listing of the workstations that have ever accessed PedCath. This can be helpful to determine what machines will need PedCath updates.

Upgrade (Institutional-Wide Upgrade)

The Institutional-wide upgrade feature allows you to specify a PedCath upgrade file to install on all machines. When PedCath is started on each workstation the upgrade will automatically be applied, if needed. You can specify an update file (.p7u,) to use as well as a few options.

Force Upgrade - Will lock out users running an earlier version of PedCath until they upgrade, even if that version is compatible.

Allow user to install later revision upgrade - Will allow a user to install a later revision of PedCath than is installed on the network. This will allow only revision updates (i.e. 8.4.x to 8.4.y), so that the database will not be modified.



! *When upgrading through many versions or if specified on the update site, it is recommended to upgrade PedCath using the full Windows installer (available as a download) rather than using an update file. The full installer cannot be used with the Institutional-Wide Update feature, and must be applied to each workstation manually.*

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PedCath Formula Reference

Body Surface Area—Dubois and Dubois height-weight equation

Units: Weight in Kg, Height in cm (Yang et al., page 42).

$$BSA (cm^2) = Wt^{.425} \times Ht^{.725} \times 71.84$$

Convert BSA (cm²) to BSA (m²):

$$BSA (m^2) = \frac{BSA(cm^2)}{10000} = \frac{BSA(cm^2)}{100 \times 100}$$

O₂ Capacity

The default factor is 1.36 (Yang et al., page 45).

$$O_2 \text{ capacity} = HB \times 1.36$$

PedCath uses 1.36 as the default multiplication factor for O₂ Capacity; however, the attending physician may set an alternate multiplier: 1.36 (default), 1.34 or 1.39.

The 1.39 multiplication factor is referenced in Saksena, page 30.

To change the multiplier, you must log in as an administrator and select:

Tools-Options-Administrator-Calculations.

Multipliers are the responsibility of the cath lab medical director.

MV, SA, PA and PV O₂ Content

Referenced as PO₂ x 0.003026 in Yang et al., page 45. ***PedCath*** rounds to 0.003.

a) If PO₂ not measured

$$O_2 \text{ content} = O_2 \text{ capacity} \times O_2 \text{ sat}$$

b) If PO₂ measured:

$$O_2 \text{ content} = O_2 \text{ capacity} \times O_2 \text{ sat} + (.003 \times PO_2)$$

Oxygen Consumption

Two different Oxygen Consumption calculations are available in *PedCath*:

a) Assumed Oxygen Consumption—LaFarge method

Please Note: This method can only be used for patients whose age and heart rate fall within defined limits. Data for gender, heart rate and age are required. Age is calculated as *Cath date - Date of birth*. O₂ consumption is calculated in (ml/min)/M². (LaFarge, et al., pages 23-30)

For Males:

$$O_2 \text{ Consumption (ml/min/m}^2\text{)} = 138.1 - (11.49 \times \log_e(\text{age in years})) + (0.378 \times (\text{heart rate}))$$

For Females:

$$O_2 \text{ Consumption (ml/min/m}^2\text{)} = 138.1 - (17.04 \times \log_e(\text{age in years})) + (0.378 \times (\text{heart rate}))$$

b) Assumed Oxygen Consumption—Seckeler method

Please Note: This method can be used for patients of any age. Data for age (years), weight (kg), single ventricle anatomy, and critical illness (ICU status) are required. Single ventricle and critical illness are dichotomous variables (given a value of 1 for yes and 0 for no). Age is calculated as *Cath date - Date of birth*. O₂ consumption is calculated in (ml/min)/M².

$$O_2 \text{ Consumption (ml/min/m}^2\text{)} = 242.1 + (9.7 \times \log_e(\text{age in years})) \\ - (34 \times \log_e(\text{weight})) - (9.6 \times \text{single ventricle}) - (11.2 \times \text{critical illness})$$

c) Indexing a measured value

If a measured value is available, use the Oxygen consumption Calculator to convert the measurement to an indexed value. The calculator uses the following formula:

$$O_2 \text{ Consumption (ml/min/m}^2\text{)} = \frac{O_2 \text{ Consumption (absolute)}}{BSA}$$

Cardiac Output (*Q_p* and *Q_s*)

Cardiac Index Calculation (Yang et al., page 44):

$$Q_p \text{ (liters/min/m}^2\text{)} = \frac{O_2 \text{ Consumption (ml/min/m}^2\text{)}}{(\text{PV} - \text{PA content}) \times 10}$$

$$Q_s \text{ (liters/min/m}^2\text{)} = \frac{O_2 \text{ Consumption (ml/min/m}^2\text{)}}{(\text{SA} - \text{MV content}) \times 10}$$

Cardiac Output Calculation (Yang et al., page 45):

$$Q_p \text{ (liters/min)} = Q_p \text{ (liters/min/m}^2\text{)} \times BSA$$

$$Q_s \text{ (liters/min)} = Q_s \text{ (liters/min/m}^2\text{)} \times BSA$$

Resistance (R_p and R_s)

Wood's Resistance Unit, also called Hybrid Resistance Unit (Yang et al., page 68):

Wood's Unit = mm Hg min. liter⁻¹ or [(mm Hg)/(liter/min.)]

(Pressures in mm Hg; Flow in liter/min./m²; Resistance in Wood's Units.)

$$R_p(\textit{indexed}) = \frac{\textit{mean MPA} - \textit{PA wedge}}{Q_p}$$

$$R_p(\textit{abs}) = \frac{R_p(\textit{indexed})}{BSA}$$

$$R_s(\textit{indexed}) = \frac{\textit{mean Sys} - \textit{mean RA}}{Q_s}$$

$$R_s(\textit{abs}) = \frac{R_s(\textit{indexed})}{BSA}$$

New Calculations in PedCath

PedCath8 offer several sets of calculations that were not part of the standard **PedCath3** configuration. These new features can be found under the Measurements tab in the **PedCath** edit screen.

Hemodynamics				User Fields		Measurements	
Ventricular Volume (ml)				Ventricular Mass			
	EDV	ESV	EF%	% Normal	gm	% Normal	
Right	45.0	23.0	49%	162%	20.0	67%	
Left	26.9	8.9	67%	99%			
Valve Diameter				PA Diameter			
	mm	% Normal			mm	% Normal	
TV	18.0	84%		Right	10.3	96%	
MV	19.0	105%		Left	8.8	94%	
PV	15.0	123%		PA Index:	283		
AV	13.0	117%		PA Area Index:	1.34		

Ejection Fraction

$$\text{Ejection Fraction (\%)} = \frac{\text{End Diastolic Volume} - \text{End Systolic Volume}}{\text{End Diastolic Volume}} \times 100$$

PA Index (PAI)

$$PAI = \Pi \times \frac{\left[\frac{RPA}{2}\right]^2 + \left[\frac{LPA}{2}\right]^2}{BSA}$$

PA Area Index (PAAI)

$$PAAI = \Pi \times \frac{\left[\frac{RPA}{2}\right]^2 + \left[\frac{LPA}{2}\right]^2}{(279.89 \times BSA) - 35.46}$$

References:

Yang SS, Bentivoglio LG, Maranhao V, Goldberg H. *From Cardiac Catheterization Data to Hemodynamic Parameters*. 3rd ed. Philadelphia, PA: F.A. Davis Company; 1988

Saksena FB. *Hemodynamics in Cardiology: Calculations and Interpretations*. Westport, CT: Preager Publishers; 1983

LaFarge CG, Miettinen OS. The estimation of oxygen consumption. *Cardiovasc Res*. 1970;4(1):23-30.

Seckeler MD, Hirsch R, Beekman RH 3rd, et al. A new predictive equation for oxygen consumption in children and adults with congenital and acquired heart disease. *Heart*. 2015;101(7):517-524.

Graham TP Jr, Jarmakani JM, Canent RV Jr, et al. Left heart volume estimation in infancy and childhood. Reevaluation of methodology and normal values. *Circulation*. 1971;43(6):895-904.

Graham TP Jr, Jarmakani JM, Atwood GF, et al. Right ventricular volume determinations in children. Normal values and observations with volume or pressure overload. *Circulation*. 1973;48(1):144-53.

Nakata S, Imai Y, Takanashi Y, et al. A new method for the quantitative standardization of cross-sectional areas of the pulmonary arteries in congenital heart diseases with decreased pulmonary blood flow. *J Thorac Cardiovasc Surg*. 1984;88(4):610-9.

PedCath Logging

PedCath tracks cath views and edits in compliance with the Health Insurance Portability and Accountability Act (HIPAA). When a user opens the PedCath Edit screen, PedCath will log information about the cath that was viewed, the staff member who viewed it and the date and time (either the local or server time can be used based on your settings). If the staff member edits and saves the cath then PedCath will log this as well.

PedCath also logs anything exported from the system such as when any reports are printed, saved, or emailed. This includes the main PedCath report, a report from the data reporting module, the staff listing report, or a patient's billing information.

The export log keeps track of the staff member, export date and time, and export location for each type of export. The following shows the types of export actions logged and additional information saved.

<i>Export Actions Logged</i>	Additional information logged
Printed the PedCath report	Printer location
Saved the PedCath report to a file	Export location, file name
Emailed the PedCath report	Mail recipients (To: and CC:)
Printed data reports results	Query and printer location
Saved data reports results to a file	File name and query
Emailed data reports results	Mail recipients (To: and CC:) and query
Printed a patient's billing information	Printer location
Printed a patient's document	Document title, file name, and printer location
Printed the staff listing	Printer location
Exported a patient's document	Document title and file name
Locked a cath report	none
Unlocked a cath report	none
Cath report unlocked due to HL7 NACK	none
Cath report unlocked due to HL7 timeout	none
Cath report unlocked due to export error	none
Viewed a backup cath report	Backup ID
Submitted a study	Study name and study ID
Unlocked a study	Study name, study ID, and follow-up title if applicable.
Printed HIPAA log	Report description printer location
Ran batch export	Path, log file, export file type, total number of cases

Moved a cath report to a different patient record	Patient MRN, name, and id of both patient records.
Ran the IMPACT submission	Quarter and year of the submission, and whether patient identifying fields were included or not.
Successful Login, Unsuccessful Attempt, and Logout	Host and username
Deleted cath report	None
Deleted patient record	Patient name and ID.
Added new staff record	Staff ID, username, and display
Disabled staff record	Staff ID, username, and display
Deleted staff record	Staff ID, username, and display
Reactivated staff record	Staff ID, username, and display
Edited a staff record's ID fields (display name, login, hospital staff ID, NPI, LDAP ID), password reset, or changed permission level	Staff ID, username, and display, and id fields that changed.
Received a PedCath Error	Error number and description
Imported data from hemodynamics system into a new cath report.	Hemodynamics file name
Imported data from hemodynamics system into an existing cath report.	Hemodynamics file name
Flagged patient for archival	Whether the flag was added or removed. Patient name and MRN.
Archived patient	Patient name, MRN, birth date, ID
Retrieved patient from archive	Patient name, MRN, birth date, ID

PedCath logging data may be viewed from within the Administrative console on the “View HIPAA” tab.

The Diagnostic Code Set

The standard PedCath code set – Summary

If you choose, you may include codes in your **PedCath** cath reports to indicate cardiac and non-cardiac diagnosis, ECG findings, cath procedures, cath complications, surgery and pharmaceutical interventions.

The standard version of the program includes a set of codes developed for this purpose by **Scientific Software Solutions** and our medical advisors. We have found these codes to be complete, without burdening the user with excessive detail.

We are aware that no universally accepted set of codes exists for pediatric cath. Different institutions use different coding systems, and some do not use a coding system at all.

Our goal is to help you to do your work, your way. If you do not enter diagnosis codes, there will be no loss of functionality in **PedCath**. The list of codes simply will not appear in the printed report.

Optional Code Sets

If you wish to use an alternate code set, we can offer optional sets from some of the major pediatric hospitals. Currently, we have hierarchical coding systems available from the following institutions (all rights reserved by the developing institutions):

Hospital for Sick Children – Toronto, Canada

Texas Children's Hospital – Houston, Texas

Boston Children's Hospital – Boston, Massachusetts

Please call Scientific Software Solutions if you need assistance in creating an optional code set for your hospital. We can provide limited technical assistance in testing code set compatibility, and may be available on a contractual basis to customize **PedCath** to your individual needs.

It is important to select a code set before entering patient data.

If you would prefer to use an optional code set, we recommend that you use it from the start. This will avoid any need to convert old patient records at a later date.

IMPACT Registry Code Set

If your institution participates in the IMPACT Registry, the IMPACT code set for procedures, surgeries, diagnosis and events will be available for coding within the IMPACT Registry module. PedCath will also allow you to use those codes for the PedCath report if you choose. This can be easily configured with an administrative setting. When doing so the codes entered for the cath report will automatically transfer to the IMPACT module eliminating the need for cross-coding.

A complete listing of the Diagnostic Codes selected by your hospital follows this page.

Sample Reports

Your software comes with five sample cases that illustrate various features of *PedCath*.

It is recommended that you spend some time reviewing these examples and entering practice cases before logging actual data.

1. John Doe. This case illustrates a **single cath with a single set of hemodynamics**.

Note that with a single set of hemodynamics, the Summary page includes additional information.

The following printing options have been selected:

- a) **Summary** is selected. This creates a one-page summary of the cath record, including an image of the diagram.
- b) **Expanded Calculations** is selected, generating a full-page listing of the all the calculations for the sample cath.
- c) **Measurements** box is checked, so the report includes a one-page summary of the optional measurements for the cath.
- d) **Full Page Diagram** is selected. The large diagram includes any embedded hemodynamic data.
- e) **Diagram Caption** is checked. Notice that the line “**Arrows indicate catheter course**” and appears below the diagram on both the summary page and full-page diagram. Clicking the Options button in the lower right of the Cath Report Setup window may change the caption text.

2. John Deere. This case illustrates a **single cath with two sets of hemodynamics**.

Since the Summary page includes more than one set of hemodynamic data, only the summary information is printed for each set. Full hemodynamic data can be printed on subsequent pages.

Printing options:

- a) **Summary** is selected.
- b) The cath is then locked to prevent further editing.

3. Lotsa Oxygen. A single cath with two sets of hemodynamics—**includes dissolved oxygen**.

If non-zero PO₂ values are entered in the CALCULATION OVERRIDE window, dissolved oxygen is calculated.

Printing options:

- a) **Summary, Expanded Calculations and Full-Page Diagram** are selected.
- b) **Documents** box is checked. The **cath report narrative** and **letter to the referring physician** are now included.
- c) Note text formatting used in the anatomy diagram. A bold font has been used in the diagram to accent values obtained on 100% O₂.

4. Angela Plastic. This case illustrates the **Image Manager** feature.

Printing options:

- a) **Summary** report is selected.
- b) **Images** report is also selected, showing before and after waveform and angio images.

5. Buck Rogers. This case illustrates a **patient with two caths**.

In the BROWSE screen, patients with multiple caths will have those caths listed in reverse date order (i.e. from most recent cath at the top to earliest cath at the bottom).

Printing options:

- a) Rogers' post-surgery report is printed with everything except **Summary** and **Diagram Options**. This will produce a single page report.