# RSNA Medical Imaging Resource Community (MIRC)

## **Teaching File System (TFS) User Guide**

Since 2000, RSNA has supported the development of a set of free software tools for education and research in radiology. Those tools are now available through a user-led open source development project, the Medical Imaging Resource Community (MIRC).

The MIRC **Teaching Files System (TFS)** enables any radiology site to implement a locally controlled platform for producing and managing teaching files. TFS features a robust case authoring tool that lets you create teaching files for a variety of educational settings from personal and departmental case files to quizzes and conferences. It allows authors to incorporate full DICOM data sets and control access by individuals and groups of users. It can receive images directly from PACS and keep them private to the author until the case is ready for sharing. Set up is simple and TFS runs on any standard PC or server.

#### Use TFS to:

- Build a departmental teaching file that supports resident training and lifelong learning
- Create case files in formats ideally suited for peer education and personal review
- Transfer images from PACS to the TFS authoring environment conveniently and with full protection of patient information
- Create virtual conferences from case collections for tumor boards or quality assurance
- Export teaching files as PowerPoint-compatible presentation slides



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## Installing TFS



The RSNA Teaching File System (TFS) software is a Java program that can run on the most common computer operating systems (Linux, Mac OS and Windows). Typically, TFS runs on a computer within a radiology department, on the same network and with the same security protections as the department's clinical systems. Personal TFS sites can also be set up on an individual's laptop or PC.

Installation and operation of TFS on any platform is essentially identical. The installation instructions below assume that installers are comfortable with the basic functions of their chosen operating system, including how to download and find files in its directory system and launch programs.

#### System requirements:

TFS will run on most computers manufactured after 2008, with Windows XP or later or equivalent era Mac OS and Linux versions as operating systems.

#### Download and Install Java JRE and Java Advanced Imaging ImagelO Tools:

 First install the Java Runtime Environment (JRE)<sup>™</sup>, which can be found on <u>the Oracle® website here</u>. After accepting the license agreement (use of the JRE is free), download and install the file: Windowsx86 (32-bit) Offline.

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#### **Download and Install TFS**

- 3. Download the TFS installer (a Java .jar file) from the RSNA MIRC site. <u>Click here</u> to start the **download**.
- 4. Open the .jar file to begin the installation process. Accept the default values unless you have a specific reason to change them. When you see the screen shown below, type the name of the directory where you want to install TFS in the 'Folder name' field. We recommend installing TFS in a folder called 'RSNA' on a drive with adequate free space for the program and teaching files you will create.

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5. You should see a screen confirming that MIRC TFS has been installed.



#### Launch the TFS Site

6. To launch your site, open the directory where you installed MIRC, look in the subfolder named "CTP" and double-click the file named "Launcher.jar". (If the site is on a computer that is regularly shut down and restarted, like a personal TFS site on a laptop, you should right click on the Launcher file, create a shortcut and drag it to your desktop.) In the Launcher window click "Start".

#### Installing TFS

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7. Congratulations! You now have a TFS site running on your computer! After launcher runs, click "TFS Home Page" to view the site in your default browser.

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The site is populated with cases published by several public TFS sites. Bookmark it in your browser so you can return there instantly!

Follow the instructions linked below to create user accounts and begin authoring teaching files.

## **Creating User Accounts**



Once your TFS site is installed and running (click here for installation instructions), you will want to create accounts for authors, administrators and other users of the site.

1. On your TFS home page, click "Login" at upper right.

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	× Q. Photograms	Thomas Jefferson University respital - Neuro	Pluck Shukla, MD		2003-05.27	p.Mc	
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	2 P. INTERNAL CAROTED DEVISI CTION	Thanas Jefferson University respiral - Reura	Overer of Neuronadology	Neuro I	2011-00-27	p.Mc	
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	Z Q. MENAL OFFCOOTSTRONMY	Thanas Jefferson University Hospital - Neuro	Oreason of Neuronadiology	Resurs.	2011-00-27	patric.	
	P. Q. VAACARITIS WITH DICHEMIA	Thomas Jefferican University respital - Secure	Crystel of Neurorability	Bauro .	2011-08-17	p.Mic	
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3. On the User Manager page, you can create accounts by entering usernames and passwords and selecting the user privileges to assign to each user. (User privileges are explained below.) The plus (+) button allows you to enter supplemental information (name, institution, contact) for a user. The X button deletes a user account. Save whatever changes you make by clicking the save icon.

		U	ser	M	Roles	age	r					
Username	() ada	(1) 401	D. del		peb	(1) res	and a	(C) upd	Password			
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- 4. The down arrow at right allows you to download a spreadsheet (.csv) file of all users in the system. The up arrow allows you to upload a spreadsheet of users into the system (following the same format as a downloaded file).
- 5. Users can change their passwords and supplemental information by logging in and clicking the "My Account" link at the upper right of the TFS main page.
- 6. You can use an existing LDAP service to authenticate users of a TFS site Instructions on configuring this option are available <u>here</u>.

#### **TFS User Roles**

By default a new TFS site offers the following user roles:

adm (admin)	Can perform any administrative and configuration function on a
	TFS site, except shutdown of service.
aut (author)	Can create and edit documents on any library (storage service) on the TFS
	site that allows authoring. By default a new TFS site has one library, with
	authoring enable.
del (delete)	Allows users of a Clinical Trials Processor (CTP) file storage service or
	TFS site to delete files. Not generally granted to TFS users.
dep (department)	Adds the user to the "department" group. Authors can grant this group
	access privileges to documents they are creating.
pub (publisher)	Can make a document public, that is, accessible to all users of the site,
	whether logged in or not.
<i>shu</i> (shutdown)	Allows user to shut down the MIRC (CTP or TFS) service from within their
	browser. Normally assigned only under special circumstances for large
	clinical trials.
upd (update):	Allows user to upload a file (eg, TFS-installer.jar) to the Downloads page of
	a TFS site. Normally only used by administrators of sites that distribute
	software. (This capability is disabled by default for new TFS sites.)

#### **Other MIRC Roles**

By clicking the "Show All Roles" button, you can select the following roles. These roles are used by the Clinical Trials Processor functions of MIRC and are generally not relevant to TFS users.

gue (guest)	Grants users access to file stored in a CTP file storage service.
<i>imp</i> (import)	Allows users of CTP sites to establish credentials for other sites
	communicating data to them.
<i>pro</i> (proxy)	Allows users of CTP sites to grant guest status to another user to enable
	them to view a designated users images.
qad (quarantine	Allows user to access quarantined objects in a CTP pipeline.
admin)	
rea (read)	Allows user to view images they have added to a CTP storage service.

You can learn more about setting up and running a TFS site by reading articles on the <u>MIRC wiki site</u> or by viewing the brief video tutorial below.



Watch Video Instructions for Converting an Existing File <a href="https://vimeo.com/74465146">https://vimeo.com/74465146</a>

## **Searching for Teaching Files**



MIRC TFS makes it easy to search for teaching files stored on your site and other MIRC sites that are linked to yours.

In its default view, the main TFS query page provides a list of all available completed teaching files, with the most recently modified listed first. If you are logged in, you will also see links for cases you have created ("My Cases") as well as Draft Cases you have access to and your Case Approval Queue (see Authoring Teaching Files with TFS>Getting Images into TFS><u>Patient-centric workflow</u>). You will also have access to your lists of personal and shared conferences and file cabinets.

Use the Search box and button in the upper right margin of your site's main page to enter search terms and perform searches.

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d Software	🕅 🔍 SPR Unknown #82 FINAL	CMH: Children's Memorial Hospital General Pediatric Cases	Rekha Mody, MD Maura Ryan, MD		2013.02.20	2009.08.20	public
	SPR Unknown #83	CMH: Children's Memorial Hospital General Pediatric Cases	Thomas Gast, M.D. Mary Wyers, M.D.		2013.02.20	2013.02.12	public
	🗵 🔍 Adrenal cortical neoplasm	CMH: Children's Memorial Hospital General Pediatric Cases	Migena Burnazi, MD Jack Norman, MD		2013.02.12	2010.04.01	public
	🗵 🔍 SPR Unknown # 74 FINAL	CMH: Children's Memorial Hospital General Pediatric Cases	Tejal Patel,MD Tamar Ben-Ami, MD	Genitourinary	2013.02.12	2006.07.06	public
	V 🔍 Mucopolysaccharidosis	CMH: Children's Memorial Hospital General Pediatric Cases	Esther Ro /Dr. Saker		2013.02.12	2012.01.09	public
	🕅 🔍 Hypertrophic Cardiomyopathy	CMH: Children's Memorial Hospital General Pediatric Cases	Aris Musabji, M.D. Cynthia Rigsby, M.D.	Cardiovascular	2013.02.12	2005.12.13	public
	SPR Unknown # 81 FINAL	CMH: Children's Memorial Hospital General Pediatric Cases	Kim Dannull, M.D.		2013.02.02	2013.01.04	public
	SPR Unknown #82	CMH: Children's Memorial Hospital General Pediatric Cases	Rekha Mody, M.D. Maura Ryan, M.D.		2013.02.02	2013.01.30	publi
	SPR Unknown # 81	CMH: Children's Memorial Hospital General Pediatric Cases	Kim Dannull, M.D.		2013.01.08	2013.01.04	publi
	SPR Unknown #80 FINAL	CMH: Children's Memorial Hospital General Pediatric Cases	Dan Musick, M.D. Mary Wyers, MD		2013.01.08	2011.01.14	publi
	Acute appendicits in 2 brothers	CMH: Children's Memorial Hospital General Pediatric Cases	Jordan Tasse, M.D. Richard Shore, MD	Gastrointestinal	2013.01.03	2010.12.08	publi
	🗹 🔍 Postsurgical bladder perforation	CMH: Children's Memorial Hospital General Pediatric Cases	Dan Jeong M.D. Dr. Richard Shore		2013.01.03	2011.03.03	publi
	🗹 🔍 Duodenal Atresia	CMH: Children's Memorial Hospital General Pediatric Cases	Rupesh Kalthia M.D. Richard Shore, M.D.		2013.01.03	2011.03.10	publi
	SPR Unknown #80	CMH: Children's Memorial Hospital General Pediatric Cases	Mary Wyers, M.D.		2012.12.15	2012.12.11	publi
	SPR Unknown # 79 FINAL	CMH: Children's Memorial Hospital General Pediatric Cases	Mary Wyers, M.D.	Gastrointestinal	2012.12.15	2012.12.07	publ
	🗹 🔍 Tethered Cord.	CMH: Children's Memorial Hospital General Pediatric Cases	Michael Rozenfeld, DO. Maura Ryan, MD.	Neuro	2012.12.10	2012.12.05	publi
	RSNA 2012 MIRC Presentations	RSNA MIRC Library	John Perry		2012.11.22	2010.11.22	publi
	SPR Unknown # 78 FINAL	CMH: Children's Memorial Hospital General Pediatric Cases	Esben Vogelius, M.D.		2012.11.20	2012.10.26	publi
	SPR Unknown #79	CMH: Children's Memorial Hospital General Pediatric Cases	Mary Wyers, M.D.		2012.11.20	2012.11.20	publi
	🗵 💫 Congenital Central Hypoventilation Syndrome with associated Neuroblastoma.	CMH: Children's Memorial Hospital General Pediatric Cases	Erin Happ Francis Prendergast	Pulmonary	2012.11.20	2011.03.29	publi
	🗵 🔍 Meconium Ileus	CMH: Children's Memorial Hospital General Pediatric Cases	Vishal Khiatani Francis Prendergast, MD		2012.11.20	2011.05.03	public
	🗵 🔍 Test of pixel anonymizer	RSNA MIRC Library	Krishna Juluru		2012.11.19	2012.08.16	publis
		CMH: Children's Memorial Hospital General Pediatric Cases	Sarah Deitch	Musculoskeletal	2012.11.16	2010.09.08	public

#### **TFS Search Box**

The basic TFS search is a free-text search that finds cases containing the search term anywhere in their content. Searches only find cases you are allowed to access (so, again, you should log in before performing a search).

You can search on more specific criteria using the Advanced Search. Click the link beneath the Search box and the Advanced Search window will appear.

#### **TFS Advanced Search Window**

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Download Software	Chiari 2 Malformation with Myelomeningoce	CMH: Children's Memorial Hospital General Pediatric	Cases	Sam Mouli Maura Ryan			2013.04.22	2012.12.28	public	
	Tracheal stenosis		CMH: Children's Memorial Hospital General Pediatric	Cases	Laurence Donah	ue		2013.04.16	2013.03.20	public
	SPR Unknown # 85 FINAL		CMH: Children's Memorial Hospital General Pediatric	Cases	Liz Overstreet			2013.04.15	2013.02.22	public
	SPR linknown #86		CMH: Children's Memorial Hospital General Pediatric	Cases	Ethan A. Smith,	M.D.		2013.04.15	2013.04.12	public
	Retastatic lung adenocarcinoma	Advanced Search				ue		2013.04.12	2013.03.20	public
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	Vesicoureteral Reflux, Bifid collecting syste	Author:		25 results	/site 👻		Gastrointestinal	2013.04.04	2006.05.15	public
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	SPR Unknown #84 FINAL		Go			o.	Musculoskeletal	2013.03.29	2004.08.17	public
	SPR Unknown # 85					).		2013.03.29	2013.03.15	public
	SPR Unknown #54 FINAL		CMH: Children's Memorial Hospital General Pediatric	: Cases	Christopher Reil Richard Shore	(	Gastrointestinal	2013.03.28	2010.11.26	public
	Scimitar Sacrum		CMH: Children's Memorial Hospital General Pediatric	Cases	Tameem Soumar	1	Neuro	2013.03.28	2011.06.17	public
	Acute Necrotizing Encephalopathy of Childh	ood	CMH: Children's Memorial Hospital General Pediatric	Cases	Nicole Reinholdt,	CRA	Neuro	2013.03.28	2008.09.08	public
	Qsteopathia Striata		CMH: Children's Memorial Hospital General Pediatric	Cases	Matthew Del Giu	dice	Musculoskeletal	2013.03.28	2012.01.13	public
	Relateral Phenchromocytomas		CMH: Children's Memorial Hospital General Pediatric	Cases	Christopher Henl	ey		2013.03.21	2013.03.20	public
			CMH: Children's Memorial Hospital General Pediatric	Cases	Brian D. Antonia	MD NO	Musculoskeletal	2013.03.20	2011.08.25	public
	Osteomyeiitis with involucrum		CMH: Children's Memorial Hospital General Pediatric	Cases	Mary Wyers, M.I Sonya Bhole	).		2013.03.18	2012.10.29	public
	* Metanephric stromal tumor		CMH: Children's Memorial Hospital General Pediatric	Cases	Cynthia Rigsby Erin Mccomb M	D.	Cardiovascular	2013.03.18	2004.10.13	public
	* TAPVR			-	Cindy Rigsby, M.	D.	e di ulo voscula			p a d m

In the Advanced Search Window you can request cases that have search terms in specific sections of a teaching file and search by title, author and keywords. You can also control the way search results are organized and presented.

Finally, if your site has access to more than one MIRC TFS library, you can limit the scope of your search to a selection of one or more of those libraries.

## **Creating a Teaching Conference**



You can use MIRC TFS to combine teaching file cases into conferences and to present the cases in a way especially suited to conferences.

#### **Create a New Conference**

To set up a conference, first log into your MIRC site. You will see links for Shared and Personal conferences in the left hand control bar: select which kind of conference you wish to create. Shared conferences will be available for other logged in users of your site. They will be able to view only cases they have permission to see.

Create a new conference using the control that appears in the body of the page (or by clicking on the word Conferences in the control bar).

#### **Create New Conference control**

Type the name of the conference and click ok.

The conference should now appear under the Personal Conferences

#### Add Documents to a Conference

To add teaching cases to your conference, go to the TFS home page and select from the available files. Use preview mode to see thumbnail versions of the images in a case.

#### **Preview Mode**

Select a case you want to add to the conference and open it (by clicking on the title). Click on the Document tab and you will find a button to Add to Conference (along with several editing and export options).

#### Add to Conference button

(Note that if you don't see these controls, you probably don't have permission to use the case.)

Select your conference from the list of available conferences in the window that pops up.

#### **Run a Conference**

When you have added all the cases you want in your conference, and it comes time to present it, TFS allows you to show it in a seamless way optimized for teaching. Select the conference you want to run from the left-hand control bar. Then click the movie projector icon to launch the Case Navigator.

TFS provides simple controls to let you present the cases in order, showing only the images and skipping over any explanatory text sections.

## **Exporting Cases from TFS**

MIRC TFS is designed to give you flexibility in maintaining and moving the cases you create. It allows you to export cases from your TFS site:

- as zip files that can be imported to another TFS site
- as presentation files that can be opened and edited in MS-PowerPoint

To export cases, you must be a logged into the TFS site you are using, with permissions to export the desired cases.

#### Download as a .zip File

To download a single case you are viewing, click on the **Document** tab and click the **Download Document** button. The case will be exported as a .zip file you can save to a local hard drive and upload to another TFS site using the Submit Service on the main TFS page.



#### **Download as MS-Powerpoint-compatible Presentation Slides**

To download the case as a set of presentation slides, click the **Download Slides** button. The case is exported in the Open Office presentation format (.odp), which can be opened and edited with presentation software including MS-Powerpoint (version 2010 and later).





Watch Video Instructions https://vimeo.com/74465145

MIRC TFS is designed to make authoring teaching file cases (and other imaging-focused educational materials) fast and convenient. The files you create can be as simple or elaborate as appropriate for their intended use. The instructions below cover the basic steps in the authoring process, while suggesting some of the flexibility possible in using TFS.

### Instructions for Authoring Teaching Files

- Launching the TFS Authoring Tool
- Using the TFS Basic Author Tool
- Sharing a Case
- Editing a Case
- Using the TFS Advanced Author Tool
- File Cabinet
- Getting Images into TFS
  - Patient-centric Workflow
  - Using IHE TCE
  - Using Images Saved to a Shared Drive or Removable Media

#### Launching the TFS Authoring Tool

To author your first case, log in to your account on your TFS site (click here for information on creating TFS user accounts).

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Completed Cases Conferences Shared	(+++) (2) (*					
Shared	🖉 🔍 Title	Library	Author	Specialty		Access
	Prostate metastasis affecting recurrent laryngeal nerve	Thomas Jefferson University Hospital - Neuro	Pamela VanTassel, MD		2012.01.02	public
	Susceptibility effect from clot in the middle cerebral artery	Thomas Jefferson University Hospital - Neuro	Pamela VanTassel, MD		2012.01.02	public
	Example Spinal Cord DTI at 3T	Thomas Jefferson University Hospital - Neuro	Adam E. Flanders		2011.05.27	public
		Thomas Jefferson University Hospital - Neuro	David Friedman MD		2011.05.27	public
	C7 BURST FRACTURE WITH SCI	Thomas Jefferson University Hospital - Neuro	Bud Flanders MD Adam Flanders MD		2011.05.27	public
	Q     Intraocular Silicone leaking into the subarachnoid space	Thomas Jefferson University Hospital - Neuro	Pratik Shukla MD		2011.05.27	public
	Cardiac Myxoma	Thomas Jefferson University Hospital - Neuro	Philip A. Araoz, MD Sharon L. Mulvagh, MD Henry D. Tazelaar, MD	Cardiovascular	2011.05.27	public
	🗵 🔍 Lymphomatous Meningitis	Thomas Jefferson University Hospital - Neuro	Robert Morales, MD		2011.05.27	public
	R OLIVOPONTO CEREBELLAR ATROPHY OPCA	Thomas Jefferson University Hospital - Neuro	Division of Neuroradiology	Neuro	2011.05.27	public
	RIGHT OPTIC NEURITIS	Thomas Jefferson University Hospital - Neuro	Division of Neuroradiology	Neuro	2011.05.27	public
	V Reperioptic meningioma od	Thomas Jefferson University Hospital - Neuro	Division of Neuroradiology	Neuro	2011.05.27	public
	V R SARCOIDOSIS, LYMPHOMA LACRIMAL GLANDS	Thomas Jefferson University Hospital - Neuro	Division of Neuroradiology	Neuro	2011.05.27	public
	V R OLIVOPONTO CEREBELLAR ATROPHY OPCA	Thomas Jefferson University Hospital - Neuro	Division of Neuroradiology	Neuro	2011.05.27	public
	Reperioptic meningioma od	Thomas Jefferson University Hospital - Neuro	Division of Neuroradiology	Neuro	2011.05.27	public
	V Sturge Weber	Thomas Jefferson University Hospital - Neuro	Hiliary Hochberg MD	Neuro	2011.05.27	public
	CHOLESTEROL GRANULOMA LEFT PETROUS APEX	Thomas Jefferson University Hospital - Neuro	Division of Neuroradiology	Neuro	2011.05.27	public
	V R Pituicytoma	Thomas Jefferson University Hospital - Neuro	Pratik Shukla, MD		2011.05.27	public
	Coligodendroglioma vs low grade glioma	Thomas Jefferson University Hospital - Neuro	Division of Neuroradiology	Neuro	2011.05.27	public
	CENTRAL NEUROCYTOMA	Thomas Jefferson University Hospital - Neuro	Division of Neuroradiology	Neuro	2011.05.27	public
	Representation and the section	Thomas Jefferson University Hospital - Neuro	Division of Neuroradiology	Neuro	2011.05.27	public
	RETROMASTOID DURAL ARTERIOVENOUS FISTULA	Thomas Jefferson University Hospital - Neuro	Division of Neuroradiology	Neuro	2011.05.27	public
	RENAL OSTEODYSTROPHY	Thomas Jefferson University Hospital - Neuro	Division of Neuroradiology	Neuro	2011.05.27	public
		Thomas Infference University Upersited Name	Division of Neuroscielations	Marian	2011 05 27	and Ka

Once you are logged in, you'll see in the menu at left that you can choose between the basic and advanced authoring tools. Start by clicking the link for the Basic Author Tool.



#### Using the TFS Basic Author Tool

Once you've launched the Basic Author Tool, you'll see that it presents the outline of a teaching file case defined by an authoring template. By default, the template presented is the Basic Author Service Template, which includes a title, author information and a set of five sections with defined headings (Abstract, History, Findings, Diagnosis, Discussion).

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RSNA TFS						Clear	Search Advanced Search	Select Libraries	Search	Welcome	My Account	Logout
My Cases Completed Cases Draft Cases Case Approval Queue	This pape may be If you wish to s	used by authors to create a MIRCd witch to a different template, s	document and submit it to the library.	Basic Author	Service							Î
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Basic Author Tool Advanced Author Tool	Add author and	document owner information:										
Submit Service Zip Service	Author's name		Dr. Expert Radiologist									
Author Summary	Author's affiliat	tion:	Expert Radiology Practice									
Query Service	Author's phone	or email:	nformatics@rsna.org									
File Service Storage Service	Document own	er's username:	ExRad									
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A site administrator can change the templates presented in the Basic Author Tool. <u>Refer to this article on the MIRC Wiki for instructions.</u>

The default initial title of a new case is the same as the template name. Change it to something that reflects the real subject so users can find the case once you have a fully developed library of cases).

Information you enter under "Add author and document owner information" will be used for the case you are currently authoring and as the default information for cases you author in future when logged into the site. (You can update the author information for your account by clicking on My Account at upper right.)

You can add as much text as you like to each section of the template and leave any section empty if you wish.

To add images to the case, click the Choose File button near the bottom of the page. You can browse to any images accessible to the computer you are using. (See below for instructions on getting images from a PACS into the authoring environment.) Repeat for each image you want to add. Note that TFS supports several common image formats, including jpegs and most kinds of DICOM images.

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ences red	Document owner's usemame:	chris	Organize • New fold	ler	· · ·
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	Click this button to create the MIRCdoc	uments ( Submit )	File na	ime:	All Files

Once you have selected as many images as you want to include in this case, click the Submit button at the bottom of the page. TFS will launch the case you have been authoring. If you are using the Basic Author Service Template, it will look something like this:



The sections you populated with text appear as tabs in the upper left pane and, by default, the file opens to the first in the sequence. Any sections you left blank will be missing. Note that the Document tab includes information about the case (including author, title and abstract) and controls you can use to share, edit and manage it.

The images you added to the case appear in the large right pane, in the sequence in which you added them. The controls at the top of the image pane let you flip through the images. Thumbnail "scout" images appear in the lower left pane.

You've mastered creating a new case with the basic authoring tool! Now on to sharing, editing and managing cases in your library ...

#### **Sharing a Case**

When you create a new case, by default it is private—meaning only you can access it. By clicking the Publish button on the Document tab, you make it viewable by all users of your site.



You can set more specific access controls by using the Advanced Author Tool (see below). You can also create Conferences, which allow you to share a designated set of files with a group of TFS site users (see instructions for How to Set Up and Run Conferences).

#### **Editing a Case**

You can make changes to a case (assuming you are logged in and have privileges to edit the case) using the controls on the Document tab. Clicking the Edit button will launch the Advanced Author Tool (see below). If you just want to add images to a case or sort the images in the case, there are buttons to launch simple pop-up screens to handle those functions.



You can make more extensive changes to the text, images or other attributes of an existing case by using the Advanced Author Tool.

#### Using the TFS Advanced Author Tool

When you are logged in to TFS you will see an Edit button the Document tab of any case you have privileges to modify.



Clicking the Edit button will launch the Advanced Author Tool. It provides a wealth of functions to add, modify or delete section tabs, text and images.



The section tab names available in the case you are editing are shown in a row of labeled boxes. Click on any one to add or modify text and add or remove images. There are special tabs where you can place Indexed Content, which TFS will use in searching for documents but won't display to other users, and PHI, patient-identifying information that will be visible only to the author.

The row of icons at the top of the window lets you add, delete or change the sequence of sections, paragraph text blocks, images, captions, patient information blocks, links to external Web pages, quiz questions and comments.

#### **File Cabinet**

File Cabinet provides the palette of images you can use in creating and editing a case in the Advanced Author Tool. To add an image to any section, click to select the image in the File Cabinet (it shows a red frame when selected) and click the add images button in the toolbar (the one with the green icon).

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<b>istory</b> Is the Items toolbar icons to insert, remove, and rearrange ci	entant Rems.	Cabinet
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To load images into your File Cabinet, navigate to it from the main TFS window. When you are logged in, a link to the File Cabinet appears in the left navigation bar. Note that on some sites you may have a choice of more than one File Cabinet to use. There are two file cabinets on most TFS sites: Personal and Shared. Images added to your personal file cabinet can only be viewed by you, while images added to the shared file cabinet are visible to other TFS users. Click the link to open the desired one.



The Add Folder button helps you organize the images in your File Cabinet.

Click the double up arrow to browse for and upload images. Choose the file you would like to add to the file cabinet by clicking on the "Choose File" button and selecting the file from your computer. Then click "Submit File" to add it to the file cabinet.

#### **Getting Images into TFS**

TFS supports a few different methods for moving images from the PACS workstation, where radiologists typically view them, into TFS so they are available in the authoring tool.

#### Patient-centric Workflow

TFS can act as a DICOM receiver (SCP) so you can configure your PACS to send images directly to it. While the precise functionality varies from PACS to PACS, most current systems can be configured to send to alternate destinations. If you set up your TFS site as a destination, you can push image studies directly to it. While some PACS only allow you to send complete studies, others can be configured to send selected images (see, for example this <u>MIRC Wiki article on configuring GE Centricity PACS to send selected images</u>).

When you send images from PACS to TFS, they initially go into a case queue that only the logged in users of the site can see. While in that queue, the images retain patient identifying information so the author can find them. Multiple studies sent to TFS for a single patient will all be added to the same case. TFS even uses study acquisition date information from DICOM images to establish the time relationship of a patient's multiple studies. The initial study is set as the baseline and subsequent studies indicate how much later they were acquired (eg, "65 days later").

Once the author opens the case, edits and saves it, patient information is removed and the case is moved from the case queue to the author's cases (and shared with whomever the author selects).

#### Using IHE TCE

Some PACS systems—notably Fuji Synapse and Candelis—can connect to TFS using a standard set of DICOM protocols specified in the <u>IHE Teaching File and Clinical Trial Export (TCE) profile</u>. This method allows you to specify key images from a study to include in a case and to add supplemental information at the time of export to make it easier to find the images and author the case. The example below is based on Fuji Synapse's implementation of TCE.



At your workstation, open one or more studies that you would like to use to create a teaching file. You can select entire studies or individual images within studies. To select individual images, go to the Overview tile format (Right-click > Tile Formats > Overview) and click on the desired images. Selected images display surrounded by a white box.



When you've selected the images and studies you wish to send, click on the DICOM transfer button in the main toolbar.

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When the dialog box pops up, select the tab labeled 'to Teaching Archive.'

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If you have selected individual images, you will see them in the list of selected items. If you select an entire study, you will see a single line for the study with item type Study Folder.

Scroll down, and select from the configured destinations, or enter the details for a new destination. In some Synapse systems, users cannot setup new Teaching Archives, but you should contact your system administrator if you wish to send to a MIRC TFS site not configured in your system.

In the Information for Manifest section, enter the details of the teaching file. There are only two required fields: title and archive user. Abstract and Additional Notes can be added if you think they will be helpful in creating the teaching file case.

In the Archive User field, enter the name you use to log into your MIRC TFS site.

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If you want to fill in case details—including History, Findings, Discussion and Diagnosis—scroll down. Of course, you can always add or edit these on the RSNA TFS once the teaching file is created.

When you've added all the information you want to include, click Send. Sending may take a few minutes to complete, depending on the number of images you send and your network speed. When all the items are listed as completed, your case should be ready on the TFS site where you sent it. You can log in to view it, edit it, change access permissions—and all the other things TFS enables you to do with teaching file cases!

#### Using Images Saved to a Shared Drive or Removable Media

If there is no way to connect directly to a TFS site from their workstations, many radiologists save images for teaching files or presentations to removable media (such as a "thumb drive" or CD) and physically transfer them to a system where they can access TFS. This approach is inconvenient, hard to manage and prone to loss or exposure of information. However, if you are unable to persuade your IT administrator to connect to a TFS site via Patient-Centric Workflow or TCE, you can author cases using images stored on your local computer (or any accessible drive) using either the basic or advanced author tools as described above.

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- MIRC Wiki Articles on Installing, Configuring and Running a TFS Site
- Download the latest version of TFS
- See how Lurie Children's Hospital of Chicago is using TFS
- Read MIRC User Stories in RSNA News
- Browse the RSNA MIRC TFS Site
- Get the Details on TFS Security and Features
- Join the MIRC User Forum to post questions and provide feedback

