

# RADON

## MEDICAL IMAGING



### TIMS 2000 SP

## Connectivity Solution

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EXECUTIVE OVERVIEW

# TIMS 2000 SP

For Recording Modified Barium Swallow Studies

# Executive Summary

## What is TIMS?

The TIMS System is a PC based video recording device that connects to any fluoroscope. TIMS records high-resolution / high-frame rate video with synchronized audio, and automatically converts the study to DICOM format for archival to any PACS or VNA.

Built-in software tools allow for quick review and editing of recorded studies. Additional included software can be installed on an existing hospital computer, allowing studies to be reviewed in the speech pathology office, freeing up the fluoro room for the next procedure.

## Why is TIMS needed?

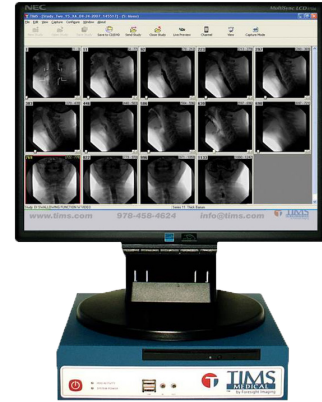
The TIMS System typically replaces low resolution DVD recorders, and is required for all fluoroscopes doing MBS studies. For years speech pathologists have struggled with these limitations, putting patients at risk by not using diagnostic quality imagery to make clinical decisions. Simply put, only TIMS provides the Standards of Care recommended for performing modified barium swallow studies.

## What benefits does TIMS provide?

- **Improves patient outcomes** by providing speech pathology team with diagnostic quality imagery.
- **Improves patient safety** by reducing the need to re-radiate patients due to inadequate imagery.
- Better patient outcomes and better patient safety equate to **increased patient satisfaction and retention.**
- Improves fluoro room efficiency with a **significantly streamlined workflow.**
- **Reduces the risk of HIPAA violations** by eliminating the use of removable media containing patient information.
- **Dramatically increases access to MBS studies** by archiving to PACS instead of storing on DVD in a filing cabinet.

## Installation & Training?

The cost of the TIMS System includes installation and training, which typically takes place over the course of about 1.5 days. The installers / trainers are TIMS Medical staff.



*TIMS 2000 SP stationary system.*

### About TIMS Medical

- TIMS Medical is a division of Foresight Imaging, based in Chelmsford, MA.
- The TIMS DICOM System has been shipping since 2004.
- Over 4000 TIMS DICOM Systems have been installed worldwide.
- To maintain our high standards, all hardware and software development is done in house.
- Your continued satisfaction is our number one priority. TIMS Medical prides itself on outstanding customer service and support!



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# Comparing TIMS to Your Existing Recording Device

## Standard of Care

*Meeting the Standard of Care for recording MBS studies requires some consideration regarding frame rate and image resolution...*

### Frame Rate

Because events during a Modified Barium Swallow Study happen so quickly (a fraction of a second), it is critical to capture the fluoro imagery at 30 frames per second.

Most fluoroscopes can acquire at only 10-15 fps, meaning critical information can be completely missed. This limitation was initially overcome by recording studies with VHS tape, and then DVD.

### Image Resolution

Unfortunately VHS and DVD have their own limitations as they only capture at 1/4 of the resolution of the fluoroscope (640x480). For years SLPs have had to make clinical assessments based on low resolution imagery. A fair question to ask is: "would you provide your radiologists with fluoro imagery that is only 1/4 the resolution of the fluoroscope?"

### Synchronized Audio

TIMS records synchronized audio allowing SLPs to verbally annotate the study with the consistencies given to the patient, clinical observations and patient reactions. No fluoro provides this capability.

### File Size

In addition to providing the Standard of Care required for recording MBS studies, the TIMS System uses industry standard compression to significantly reduce the size of the completed study. *Recording MBS studies with just the fluoroscope creates studies averaging about 4GB!*

## Comparison at-a-glance...

	TIMS	DVD	Fluoro
<b>Resolution</b>	1024 x 1024	640 x 480	1024 x 1024
<b>Frame Rate</b>	30 fps	30 fps	10-15 fps
<b>Audio</b>	Yes	Maybe	No
<b>File Size</b>	~300MB	N/A	~4GB



*TIMS Mobile Cart system with 27" touch screen display.*

## Evidence Based Studies

- Several studies have been conducted which conclude that 30 fps is required to accurately assess an MBS study:
- **Preliminary Investigation of the Effect of Pulse Rate on Judgments of Swallowing Impairment and Treatment Recommendations** - 2013  
<https://link.springer.com/article/10.1007%2Fs00455-013-9463-z>
- **Can we use pulsed fluoroscopy to decrease the radiation dose during video fluoroscopic studies in children?** - 2008  
<https://www.ncbi.nlm.nih.gov/pubmed/19070700>

# Workflow and TIMS DICOM Review Software (TDRS)

## Workflow Flexibility

Not all hospitals have the same workflow requirements. The TIMS System offers a high degree of flexibility when it comes to choosing a workflow. Illustrated below are the two most commonly deployed workflows.

### TDRS Workflow

Included with every TIMS System is a copy of our TIMS DICOM Review Software (TDRS). This Windows application can be installed on a hospital supplied desktop or laptop PC. Enabling this workflow allows studies to be quickly sent to the Speech Pathology office for editing and review, instead of tying up a valuable fluoro suite, meaning more fluoro studies per day.

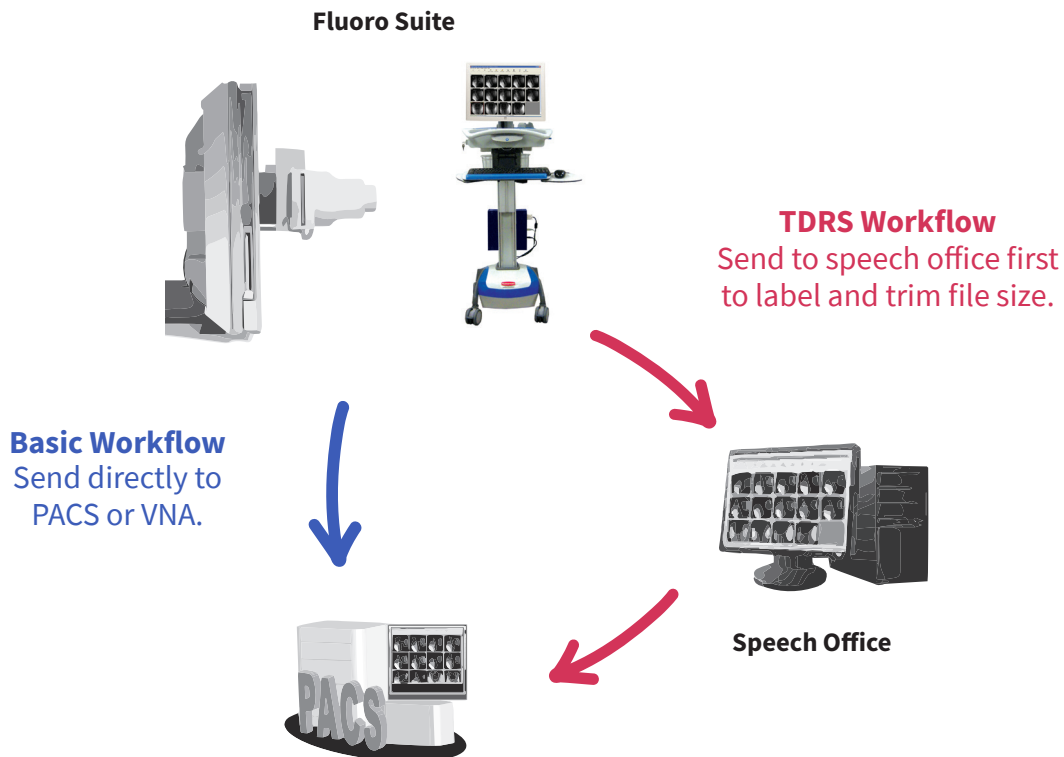
The powerful editing and review tools in found in TDRS make it easy to further reduce the size of the study, saving even more room in PACS. When editing and review are complete, the study can then be sent to PACS for long term archival.

### Basic Workflow

Alternatively, editing and review of the study can be done in the fluoro room using the TIMS System. The study can then be sent directly to PACS. This workflow is often used when either the speech team does not have dedicated computers, or if there is a requirement to have the full study available in PACS immediately after it is performed.

### Other Workflows

The workflow can also be configured to send to PACS and TDRS simultaneously, in which case the speech team would just delete the study in their office when complete. TIMS can also archive to a network storage location, VNA, DVD, USB Drive, etc.



# What I Need to Know as the...

## Director of Radiology

### **What is required to install TIMS?**

We provide a junction box which is mounted to an appropriate wall in the fluoro suite. The box has connections for video and trigger cables from the fluoro, and LAN as well. This would ideally be mounted near a 120v power outlet. We typically need about a 4 hour window in the fluoro room to install TIMS into the prepared room.

### **How will TIMS impact my radiologists?**

Your radiology staff will typically perform the studies as usual. The TIMS System will record automatically whenever the fluoro is being activated. In order for TIMS to capture 30 unique frames per second, the fluoro should be set to “continuous” mode.

### **How much room does the TIMS require?**

The stationary TIMS System is usually located on a control room counter top. It has a small (12” x 12”) footprint, along with a compact keyboard and mouse. The TIMS System Mobile Cart only requires about 2’ x 2’ of floor space and can typically be easily stored in a corner of the room.

## PACS Administrator

### **What is required to integrate TIMS to our PACS?**

The TIMS is basically set up as another modality in your PACS. TIMS will need to be assigned an AE Title and IP address, and we’ll need a port number to communicate with PACS. If you will be sending studies from the TIMS DICOM Review Software (TDRS), it will need the same. TIMS also easily integrates with your existing worklist server to retrieve patient information.

### **What file types does TIMS send, and how big are they?**

The default (and highly recommended) setting is motion JPEG file format. The imagery will be visually lossless and remain diagnostic quality. When using motion JPEG most MBS studies are about 300MB on average. We do support JPEG Lossless and Uncompressed, but the files will be much larger.

## IT Manager

### **Can we apply our anti-virus and / or encryption policies to TIMS and TDRS?**

TIMS is compatible with most major encryption and anti-virus applications. However, it may be necessary to enter anti-virus or firewall exclusions which we can provide.

### **What are the requirements for the hospital computer that TDRS will be installed on?**

- Operating System: Windows 7 or 10 Professional 32/64 bit
- Memory: 4GB minimum, (8GB for best performance)
- Hard drive: 500GB with at least 250GB free space available, 7200 rpm or better. SSD drives recommended for best performance.
- CPU: 4th generation Intel i3 (Haswell) or better recommended

# More Frequently Asked Questions...

## Support & Maintenance

### What support and maintenance is included?

Your TIMS System includes 1 year of support and maintenance. After which support can be renewed annually for up to 5 years. We also offer a “Support Bundle” at time of purchase which provides the full 5 years of support at a reduced cost.

After 5 years we recommend taking advantage of our CPU Upgrade program which gets you into a new TIMS computer for a reasonable cost.

The support contract includes:

- Unlimited phone & remote access support (using GoToAssist).
- Unlimited access to our training documents and videos, or live training using GoToMeeting.
- Free software upgrades, of which there are usually 1-2 per year.
- Advance Replacement: if we are unable to resolve a problem with the TIMS computer remotely, we will 2-day ship an advance replacement TIMS System to get you back up and running quickly.

## Pre-sales Support

### What if we have questions as we are considering the purchase of a TIMS System?

Your account manager would be happy to provide any of the following:

- GoToMeeting demonstration of the TIMS System which covers the entire workflow start to finish.
- Schedule conference calls to cover any technical issues for PACS, radiology or IT.
- Revised quotes, or any other supporting documentation required.
- Referrals to other satisfied TIMS customers, in your area if possible, or from other hospitals in your healthcare organization if available.

## Other Uses for TIMS

### Can the TIMS be used with more than one fluoroscope, or record other types of studies?

If you purchase your TIMS on a mobile cart, it can be used in additional fluoro rooms. Each additional room would require an “Extra Modality Kit” as well for an added cost. The TIMS can, in fact, record video from ANY modality that outputs video. TIMS is used to record: ultrasound, endoscopy, FEES, interventional radiology, CT, MRI, etc. Because of the inevitable scheduling conflicts that would arise, it often makes more sense to purchase a dedicated TIMS for busy facilities.

## Key Resources

### Corporate Headquarters

TIMS Medical, a division of Foresight Imaging  
1 Executive Drive, Suite 202  
Chelmsford, MA 01824

Main Phone: 978-458-4624  
Support Hotline: 978-458-4624 x204  
Fax: 978-458-5488

### Web Resources

Main website: [www.tims.com](http://www.tims.com)  
TIMS Demonstration: [Click Here](#)  
TIMS Data Sheet: [Click Here](#)



# Addendum

## Average Study Sizes

The TIMS System supports several compression algorithms, with Lossy JPEG being the most prevalent. This option provides the best compression, without compromising image quality. The table below provides estimated study sizes, based on studies being recorded at the recommended 30 frames per second. The top table should be used for most fluoroscopes which typically output at a resolution of 1024 x 1024.

Image size = 1024 x 1024 monochrome				
# of frames	time@30fps	uncompressed	lossless	lossy at good quality (18)
3000	100 seconds	3000 MB	1200 MB	250 MB
1400	46 seconds	1400 MB	570 MB	117 MB
1000	33 seconds	1000 MB	400 MB	83 MB
500	17 seconds	500 MB	200 MB	42 MB
100	3 seconds	100 MB	40 MB	8 MB

Image size = 512 x 512 monochrome				
# of frames	time@30fps	uncompressed	lossless	lossy at good quality (18)
3000	100 seconds	750 MB	300 MB	62 MB
1400	46 seconds	350 MB	140 MB	29 MB
1000	33 seconds	250 MB	100 MB	21 MB
500	17 seconds	125 MB	50 MB	10 MB
100	3 seconds	25 MB	10 MB	2 MB