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# Implementing a Zero Footprint PACS Viewer in C-EMR and CPS

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# Implementing a Zero Footprint PACS Viewer in C-EMR and CPS

- ▶ Imaging needs, options, and requirements
  - ▶ Women's Care history
  - ▶ Why we do care about imaging in the patients chart?
  - ▶ What are some of the options?
- ▶ What Has Women's Care Done?
  - ▶ DICOM listener
  - ▶ HL7 interpreter
  - ▶ Batch file for regedit
  - ▶ Batch file for DICOM viewer
  - ▶ DICOM viewer
- ▶ Future Enhancements
  - ▶ DICOM modality worklist



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Imaging Needs, Options, and Requirements

# Women's Care History

- ▶ Clinic History
  - ▶ 4 clinics: CCP, RB, Fertility, and MFM
- ▶ Clinic Size
  - ▶ ~6,000 deliveries
  - ▶ ~15,000 ultrasounds
  - ▶ ~20,000 patients
- ▶ C-EMR and CPS
  - ▶ Shared Centricity EMR w/ 8 other specialties
  - ▶ Dedicated CPS server



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# Why we do care about imaging in the patients chart?

- ▶ Meaningful use Stage 2
  - ▶ Menu Measure 3
  - ▶ Imaging results consisting of the image itself and any explanation or other accompanying information are accessible through CEHRT.
- ▶ Quality Improvement project
  - ▶ In addition to Ultrasound reports, Images are made available to referring providers and for peer review
- ▶ Patient Care/Safety



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# What are some of the Options?

- ▶ Outside Imaging
  - ▶ Interconnectivity
  - ▶ HTML Links
- ▶ With PACS/RIS Integration
  - ▶ PDF reports
  - ▶ Bi-directional HL7 interface
- ▶ Without PACS/RIS
  - ▶ HL7 Interpreter



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What Has Women's Care Done?

## DICOM listener

- ▶ DICOM SCU, C-ECHO, C-Move, C-Store, C-Get
- ▶ Stores files in structured tree format
- ▶ Grabs DICOM meta data
- ▶ Stores meta data to database
- ▶ Generate HL7 messages as needed
- ▶ Utilizes C# and RZDCX library
  - ▶ <http://www.roniza.com/products/rzdcx-fast-strike-dicom-toolkit/>



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What Has Women's Care Done?

# HL7 Interpreter

- ▶ Determine source data, in our case, it is an ORU message from DIGISONICS
  - ▶ Determine what information is needed from the ORU message to build the link
  - ▶ If OBS terms are also being populated, there are several fields in the ORU and MDM message that need to match (This information is found in GE's Managing Interfaces with Centricity Electronic Medical Record, ImageLink -> Using external attachments)
  - ▶ File(s) are then sent to LinkLogic (first the ORU (if sending in OBS), then the MDM)
  - ▶ Sample link in EMR:  
DicomViewer:\\servername\sharename\folders\dicomimage  
because the DicomViewer is set to run the batch file, the viewer then launches



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What Has Women's Care Done?

# Install using Jobs.txt via Centricity



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- ▶ 'JobNum',emr,\,extract,'Batch.bat',all
  - ▶ Batch file trigger must be in the source folder.
  - ▶ Installs the reg settings to make the link executable this is only run once
- ▶ Regedit Call
  - ▶ @echo off
  - ▶ Reg import \\ServerName\FileSoure\DICOMViewer.reg
  - ▶ goto END
- ▶ :END

What Has Women's Care Done?

# Regedit "DICOMViewer.reg"

Windows Registry Editor Version 5.00

[HKEY\_CLASSES\_ROOT\WCDicomViewer]

"URL Protocol"=""

@="Image Viewer by MicroDicom"

[HKEY\_CLASSES\_ROOT\WCDicomViewer\shell]

[HKEY\_CLASSES\_ROOT\WCDicomViewer\shell\open]

[HKEY\_CLASSES\_ROOT\WCDicomViewer\shell\open\command]

@="\\ServerName\FileShare\DicomViewer.bat %1"



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# DICOM Viewer

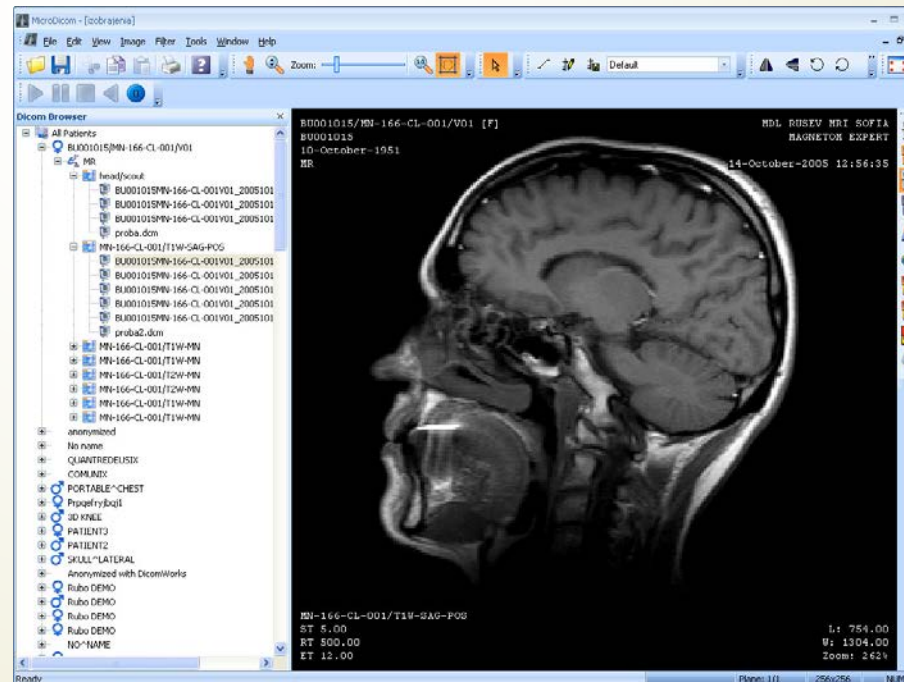


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- MicroDicom - free DICOM viewer for Windows
  - <http://www.MicroDICOM.com/>
  - Can used any DICOM viewer that allows for UNC path scanning
  - Full DICOM Viewer



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What Has Women's Care Done?

# Batch file for DICOM Viewer

```
Echo off
```

```
REM Gets Passed in Variable
```

```
set str= %1
```

```
REM Trims off first 13 chars ~DICOMVIEWER:
```

```
set str=%str:~13%
```

```
REM Runs MicroDicom in scan mode of the folder passed in.
```

```
if %PROCESSOR_ARCHITECTURE%==AMD64 start
```

```
\\ServerName\FileShare\MicroDicomx64\mdicom.exe /scan %str%
```

```
if %PROCESSOR_ARCHITECTURE%==x86 start
```

```
\\ServerName\FileShare\MicroDicomx86\mdicom.exe /scan %str%
```



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What Has Women's Care Done?

# Embedded Imaging



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Document View: All Alerts(0)/Flags(0) Drug interactions Group By Date

	Date	Summary	Provider	Location	Status
	09/08/2016 2:27 PM	Imag Rpt: US OB 14w3d	Heather L York MD	WC B	Signed

Doc ID: 31 Properties: Imaging Report at WC B on 09/08/2016 2:27 PM by Heather L York MD

Patient:  
ID: DIGISONICS  
Note: All result statuses are Final unless otherwise noted.

Tests: (1) US OB 14w3d (WCUS)

Attach...

- Add attachment...
- Ultrasound Images (ext)
- Ultrasound Report (ext)

Future Enhancements

# DICOM Modality Worklist

- ▶ Allow standardized data flow between modalities and EMR
- ▶ Can Pull PM Resource schedule
- ▶ Modality or Room specific
- ▶ Order creation and charge entry



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# Thank You For Coming

➤ Questions & Comments



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