

System Wide Clinical Ultrasound Program Development

Section 3: Image Archiving and Workflow Solutions for System Wide Clinical Ultrasound (SWCUS)

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Image Archival is an essential component of any System Wide Clinical Ultrasound Program. The System Wide Clinical Ultrasound Director (SWCUD) should ensure that all departments performing Clinical Ultrasound (CUS) have available and appropriate image archiving capabilities. Image archiving serves the following purposes:

1. Record diagnostic and procedural images used for medical decision-making and allow treatment teams to view images
2. Quality assurance (QA) and patient safety
3. Quality improvement and education
4. Coding and billing compliance
5. Documentation for risk management

CUS images and interpretations performed as part of medical decision-making (vs. educational/practice examinations) should be available through the hospital's Picture Archiving and Communications System (PACS), Vendor Neutral Archive (VNA), or electronic medical record (EMR). This allows all healthcare providers on the treatment team to readily access these studies and their associated interpretations. Like patient records, CUS images are subject to audit for internal quality review processes and medicolegal purposes. CUS studies performed for educational or practice purposes should be stored in a separate repository for later review for quality assurance as well as archiving for teaching purposes.

Current Procedural Terminology (CPT) coding rules mandate that ultrasound images are saved and retrievable in order to bill for diagnostic investigations and procedural interventions.¹ Although the ultrasound CPT coding language does not specify the location and format of archival, it is optimal to have images stored electronically for efficiency, safety, and longevity. Minimum recommended requirements are that all images representative of the relevant findings be saved as videos or still images and are archived so that they are available for future review.²

Workflow Solutions

In the last decade, software advances have allowed all necessary elements of image archival, documentation of interpretation, QA, billing, and monitoring for competency assessment and credentialing to be completed electronically within a

single system. The SWCUD along with the IT team referenced in Section 1 (System Wide Clinical Ultrasound Director and Committee), should lead the exploration, compatibility assessment and integration of a workflow solution that works for all departments performing Clinical Ultrasound within the Health System. Some specific features of System Clinical Ultrasound workflow solution include:

- 1) Creating a summary report (either on the machine at the bedside or through logging into a server) including findings and interpretation which can be submitted for quality review, when applicable
- 2) Wireless (preferred if available) transfer of CUS examinations to a secured in-hospital server or cloud for quality review and archival
- 3) Wireless transfer of CUS images and interpretation to the EMR and/or hospital PACS
- 4) Generate billing reports that can be accessed by billing departments, thus facilitating accurate and consistent billing of these examinations
- 5) De Identification of images and videos that are downloaded for teaching and education
- 6) Distinguish and separate educational/practice CUS examinations from those used for medical decision-making
- 7) Flag and assign examinations to categories for future query (eg, teaching, research)

There are several commercial products available and deciding which to purchase will be hospital-specific and should be coordinated by the SWCUD and SWCUS committee. Products vary in terms of cost, ultrasound machine compatibility, hospital IT wireless network compatibility, as well as compatibility with the EMR. Some offer a HIPAA-compliant “cloud” storage option which preserves local server space and may be a consideration at certain institutions. “Middleware” software such as Qpath (Telexy Healthcare) and Ultraling that interact with hospital PACS and cloud-based networks have grown in popularity. Interest in vendor-created solutions to transfer reports to an EMR directly from the machine is also expanding. **Table 4** includes important aspects of a workflow solution program that should be considered.

One of the most important aspects to successful workflow solution integration is building an early relationship with key hospital information technology (IT) specialists. As noted in Section 1, a senior IT analyst is an important member of the CUS team. The hospital’s IT group will need to work with test documents provided

by vendors to determine if the workflow solution is compatible with the existing wireless infrastructure (routers, extenders, external or internal wireless cards) and their current interface engine (radiology information system (RIS), Health Level 7 (HL7) formatting). The IT analysts can work with the EMR team to create order interfaces and help decide if the workflow will be order driven vs worksheet driven.

Some systems may need to purchase a separate network server to accommodate cloud-based versus PACS storage systems. Concurrent meetings held with the SWCUD, vendor IT and hospital IT departments will allow all parties to develop the optimal solution for middleware interface with the EMR, as well as the overall workflow process for providers. These meetings also allow vendors to explain how other institutions have integrated their solutions and any modifications needed at those locations. A key point to discuss with the hospital IT group is the mechanism for storing educational/practice examinations. As educational images are not part of medical decision-making, images and interpretations of these examinations should not be stored or documented in the EMR. Middleware software should interface in a way that prevents interpretation worksheets for non-diagnostic examinations from appearing in the EMR, while allowing QA feedback in a similar manner to diagnostic images. This will also help the health system incurring extra costs by eliminating educational image storage in the hospital PACS (which usually charges a per image study fee).

Each department performing CUS within the hospital should have separate and distinct access to the workflow solution system such that examinations are separated by division/department/machine. This ensures accurate and appropriate quality assurance for each specialty. Often, this will require a separate license from each division/department and therefore additional costs. The SWCUD should work with the Vendor executives to negotiate an enterprise/system cost structure as opposed to multiple individual department licenses. This will create additional cost savings to the health system, especially when multiple departments are archiving CUS studies. **Figure 3** provides an example of an order driven system wide clinical ultrasound integrated workflow (utilizes Qpath, EPIC, PACS).

References:

1. American Medical Association-Practice Management-Coding and Billing. <https://www.ama-assn.org/practice-management/cpt?-process-how-code-becomes-code> Accessed 8.21.19.
2. American College of Emergency Physicians. Ultrasound guidelines: Emergency, point-of-care, and clinical ultrasound guidelines in medicine. [policy statement]. <https://www.acep.org/patient-care/policy-statements/ultrasound-guidelines-emergency-point-of-care-and-clinical-ultrasound-guidelines-in-medicine/> Accessed 8.21.19

Table 4: Steps to Establishing a Reliable Workflow

Secure/HIPAA compliant
Compatible with current (and future) ultrasound machines within the hospital
Compatible with electronic medical record and PACS or VNA
Cost
Remote accessibility
Ability to distinguish teaching/educational scan from that which is clinically indicated
Ability to automatically notify hospital coders when clinically indicated scans are complete to facilitate accurate billing of professional and facility fees
Customizability of worksheets for reporting findings/ interpretation and review
Ability to email provider performing the ultrasound from within the system to provide feedback during QA
Ability to generate reports regarding the number and types of ultrasound studies performed

Figure 3

