IMPLEMENTING A PROCESS FOR ESTABLISHING AND SHARING STANDARDIZED IMAGING PROTOCOLS TO IMPROVE CROSS-ENTERPRISE WORKFLOW AND QUALITY

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Background

- Value-Based imaging requires
  - Delivery of high quality, consistent imaging at an acceptable cost
- Challenges to overcome include
  - Implementing standardized imaging protocols, workflows, policies, and practices
  - Geographically dispersed sites managed by differing partner institutions
  - Imaging performed on variety of vendor equipment and software
- Quality control calls for
  - Creation of a “source of truth” for information
  - Ensuring process adherence by the performing technologists
  - Supported by effective communication with multiple radiologists and technologists

Case Presentation

- Our imaging enterprise consists of—
  - University of Texas Southwestern Health System (UTSW)
  - Parkland Health and Hospital System (PHHS)
  - Children’s Health System (CHS)
- Studies across the three systems are interpreted by one large radiology group with expertise in various subspecialties
Case Presentation

• Clinical Sites
  • UT Southwestern Health System
    • Clements University Hospital: 460 beds
    • 5 Outpatient Imaging Centers
  • Parkland Health and Hospital System
    • Parkland Hospital: 862 beds
    • 9 Outpatient Facilities
  • Children’s Health System
    • Dallas: 592 beds, Plano: 72 Beds
    • 2 Outpatient Facilities

• UT Southwestern Department of Radiology
  • 133 Clinical Radiology Faculty, 35 PhD Research Faculty
  • 52 Radiology Residents and 27 Fellows
  • 1482 Clinical Residents, 959 Medical Students

Challenges I

• Three different healthcare systems
  • Each with a mix of ED, inpatient, onsite outpatient, and distant outpatient facilities
  • Each location operated under local imaging protocols governed by the local administrative body
  • Three separate technical and network infrastructures

Implication: A patient may undergo different imaging protocols based simply on site of imaging rather than the nature of imaging indication
Challenges II

- Problem compounded by
  - Multiple vendors
  - Individual machine limitations which might prohibit use of an otherwise optimized protocol
  - Vendor support introduced variation due to uncoordinated support and machine updates (different software levels)

Approach to Process Redesign

- Develop Goals
- Analyze existing state
- Design future state
  - Standardized protocols
  - Develop method for delivery and updating
- Implement
- Evaluate
Initial goals

- Eliminate the heterogeneous approach to imaging patients across our system
- Provide a consistent level of care to our patients for a given clinical indication irrespective of the imaging center they choose within our system
- Deliver consistent, readily available imaging protocols as a source of truth to our technologists, radiologists and other medical staff
- Ensure adherence to imaging protocols
- Deliver consistent image acquisition and quality to streamline interpretation by the Radiologist

Existing State Analysis

- Individual locations maintained protocol guides (both paper and electronic) with varying degree of rigor
- Extremely difficult to readily obtain the protocol from another location without making a phone call or by other communication method
- Major barrier to rotating radiologists who cover different imaging locations
Future state design

- Standardized imaging protocols
- Imaging protocols which reflect specific modalities and available equipment
- All imaging protocols available uniformly at all points of care
- All sites of care have most recent and updated protocols

Implementation I

- Imaging protocols defined by subspecialty radiologist teams
- Modality specific (e.g. CT, MR, NM, US) operation committees were developed
- Represented by radiologists professional group, administrative leaders, technologists and physicists
Implementation II

- Protocols centrally managed and maintained by a “protocol czar”
- Creation of a database linking clinical imaging protocols to machine specific acquisition protocols
- Delivery of the clinical imaging protocols from our protocol library as the “Source of Truth” to all our users regardless of their location

Implementation III

- For any given modality, once the imaging protocol is finalized by the operations team, lead technologist will make the necessary changes to the imaging acquisition protocols across all scanners.
- Lead technologist communicates back to the clinical managers as well as to the “Protocol Czar”
- “Protocol Czar” posts the new / modified protocol on RADpoint
- Clinical managers sent out communication to all the staff technologists regarding the new or updated protocols
Workflow for Minor Protocol Change (Fast)

Delivery – Microsoft SharePoint as Platform
Protocol Standardization Process

CT Operations Committee reviews all existing CT protocol in conjunction with each Subspeciality group

Consensus reached

Protocol version created as pdf document by Protocol Czar

Pdf documents placed in RADpoint Library available to all sites of care and users

Utilization tracked in SharePoint

Continuous Protocol Improvement

Analysis of Existing State

• Analysis of our existing protocols confirmed the inconsistent approach across different institutions
  • 900 protocols (all modalities)
  • Marked variation
    • Outdated versions
    • Site unique protocols
    • No naming convention
Effect of Protocol Standardization

- Overall reduction in total number of protocols from over 900 to 622
- US standardization team consolidated the protocols from 84 to 52
- MR from 372 to 268
- CT from 222 to 136
- NM from 141 to 96
- Others including Fluoroscopy from 80 to 64

This is How It Works
Example of a Protocol

- SharePoint site utilization
  - Accessed 11,207 times over 3 month period
  - Protocol Library was utilized 53,717 times from July 1, 2015 – Oct. 21, 2016 averaging 3357 clicks per month
  - Number of unique users has varied from 54 being the lowest and 121 being the highest over the past six months
  - Highest use:
    - Complicated protocols (e.g., MR Brachial Plexus)
    - New / recently changed protocols (e.g., CT Chronic Aortic Dissection / TEVAR)
  - Average number of protocol changes: 2 per month per modality
Conclusion

1. We successfully instituted a process for the development, implementation and delivery of standardized imaging protocols in a complex, multi-institution healthcare system.

2. Key elements are –
   a. Strong, effective modality specific operations committees
   b. A “Protocol Czar” to manage the process efficiently
   c. Electronic publishing of the protocols to facilitate ease of access and use
   d. A mechanism to monitor compliance

Questions?