**Electronic Health Records (EHR) and Teleradiology in the Department of Defense (DOD)**

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**Disclosure Statement**

The views expressed in this presentation do not reflect official policy or position of the following:

- Department of the Air Force
- Department of the Army
- Department of the Navy
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**Overview**

- DOD EHR Mission
- The Longitudinal Health Record
- EHR Challenges
- Current EHR Implementation
- Why Teleradiology?
- Teleradiology Challenges
- Current Teleradiology Implementation
- Future Directions
- Summary
- Questions
DOD EHR Mission

- **Big Picture**
  - DOD Mission: Provide the military forces needed to deter war and to protect the security of our country
  - Military Health System (MHS) Mission: Provide health support for the full range of military operations and sustain the health of all who are entrusted to MHS care

- **MHS reasons for existence**
  - (Primary) Maintain personnel deployment readiness
    - Fitness, Immunizations, Injury/Disease Treatment, etc.
  - (Primary) Maintain a wartime medical support capability
    - Resources, Facilities, Trained Personnel
  - (Secondary) Provide medical services for beneficiaries

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The Longitudinal Health Record

- **Presidential Directive**
  "I am directing the Department of Defense and Veterans Affairs to create a new Force Health Protection program. Every soldier, sailor, airman, and marine will have a comprehensive, life-long medical record of all illnesses and injuries they suffer, the care and inoculations they receive and their exposure to different hazards. These records will help us prevent illness and identify and cure those that occur."
  — President Bill Clinton, 8 Nov. 1997

- **Required Attributes:**
  - Comprehensive: Surgical procedures to occupational hazards (e.g., radiation, jet fuel, loud noises)
  - Merged: CT scan at Air Force hospital, vitals assessment by Army medic on frontline
  - Availability: Right information at the right time

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The Longitudinal Health Record

- **Motivation**
  - Enhanced Medical Care
    - Faster and more accurate diagnosis/treatment
    - Reduction of unnecessary/repeat procedures
  - Public Health Analysis
    - Example: Lack of records prevented ruling out drugs/vaccines as cause of Gulf War Veteran’s illness
  - Disability Claims
    - Prevention of unjustified claims (e.g., radiation exposure)
    - Easier justification of valid claims (e.g., hearing loss)
  - Commander Decision Making
    - Readiness status of personnel
**EHR Challenges**

- **Large Scale Enterprise**
  - Numerous facilities across CONUS (Continental US) and OCONUS (Outside Continental US)
  - Varied technology (e.g. PACS vendors)
  - Varied policies/products
    - Administrative Only (e.g. naming conventions)
    - Resource Restricted (e.g. available lab tests)

- **Information Technology Issues**
  - Intermittent Connectivity (particularly w/ ships)
  - DOD Network Security Restrictions
  - DOD Information Assurance Certification and Accreditation Process (DIACAP)

**Medical Operations in Wartime Environment**

- EHR Accessibility at the front
- Medical documentation of care while under fire

**Patient Mobility**

- Patient’s move often (e.g. PCS)
- Medical evacuation (patient may outpace records)

**Current EHR Implementation**

![Diagram of EHR Implementation](Diagram)
Current EHR Implementation

• AHLTA – Armed Forces Health Longitudinal Technology Application
  - Backbone application for interfacing with the Clinical Data Repository and Theatre Medical Data Store
  - AHLTA Theatre is variation designed for deployed areas
  - AHLTA Mobile runs on handheld devices for use by frontline medics

Current EHR Implementation

• CHCS – Composite Health Care System
  - Predecessor to AHLTA which was largely replaced by it
  - Continues to fill the following roles:
    - Order entry to pharmacy scripts and lab/radiology services
    - Reporting of results for laboratory and radiology
  - TC2 is a variant designed for deployed areas

Current EHR Implementation

• Essentris
  - Used in support of Inpatient Care
  - Captures data at patient bedside (e.g. heart rhythms)
  - Shares information with AHLTA
  - Also used at Veterans Affairs facilities
Current EHR Implementation

- MMM – Maritime Medical Module
  - Compilation of Naval applications:
  - Functions include:
    - Patient management
    - Monitoring of environmental hazards
- MSAT – Medical Situational Awareness in Theatre
  - Provides analysis tools to aid in military decision making

Why Teleradiology?

- DOD Radiology Mission: Provide quality, world-class diagnostic and therapeutic imaging to eligible beneficiaries anywhere in the world at anytime
- Without Teleradiology, this is only possible with sufficient staffing of qualified Radiologists at each site
  - There are insufficient Radiologists to accomplish this
  - Many smaller sites have insufficient workload to merit a Radiologist
  - Deployed locations may need surge capacity
Teleradiology Challenges

- Challenges are numerous/varied
  - Administrative
    - Communication of Critical Results
    - 24/7/365 Coverage
    - Dynamic Manning
    - Workload Crediting
    - Credentialing
    - Differing Protocols
  - Technical
    - Connectivity Issues
    - Differing Platforms
    - Decentralized PACS
    - Modality Specific Concerns
    - Quality Control

Communication of Critical Results
- Critical results need to be conveyed to providers quickly
- Difficult at times within a facility, more so at distance
- Continual effort required to maintain telephone contacts

24/7/365 Coverage
- Facilities seeing emergent cases require round the clock radiology coverage
- DOD uses a “Nighthawk” program where needed
  - Army contracts night time support to civilian facilities
  - Navy contracts support for small CONUS facilities
  - Navy uses large CONUS sites for OCONUS coverage
  - Air Force uses large CONUS sites for coverage

Dynamic Manning
- Teleradiology assumes certain manning distributions
- Manning always changing (PCS, Deployment, Etc)
  - Air Force Radiologist Manning (currently 120) expected to fall to 59

Workload Crediting
- Military uses workload to determine allowed manning
- Who gets credit for procedure? Usually site performing the exposure
- Workload numbers could penalize sites performing teleradiology support
Teleradiology Challenges

- **Credentialing**
  - Providers have to be credentialed to perform services
  - Credentials are managed at the individual facilities
  - Staff performing teleradiology services have additional burden of obtaining credentialing from all sites
  - Reciprocity initiatives are in the work to resolve

- **Differing Protocols**
  - Different sites may have different expectations (e.g. content/formats of reports)
  - Different sites may use different imaging parameters

- **Differing Platforms**
  - Air Force principally uses AGFA for PACS
  - Army and Navy use multiple PACS vendors
  - Modalities used at sites span a wide variety or makes/models; each has its own nuances

- **Decentralized PACS**
  - Ideally, all images would be available anywhere
  - Unfortunately many only available within regions for immediate interpretation
  - Army and Navy currently awarding contract for a unified, mirrored, PACS archive.

- **Modality Specific Concerns**
  - Ultrasound: Requires a lot of trust from radiologist to technologist they may have never met
  - Mammography: How do you met all the requirements of the MQSA; who is responsible for program failures?
Quality Control

- Technologists are responsible for daily/weekly/monthly testing. However, who audits these programs?
- Medical Physicist Services

- Army, Navy, and Air Force all rely on regional support
- Does the medical physicist covering the Telerad Hub Site have authority to effect needed changes at the spoke site

Current Teleradiology Implementation

NAVY

- San Diego
- San Diego
- Fort Huachuca
- Fort Bliss
- Redstone Arsenal
- Fort Campbell
- Redstone Arsenal

ARMY
Future Directions

- Implementation of DOD ID number
  - Unique ID that will not use a “family medical prefix”
  - Will mitigate risk of orphaned studies/records
- HAIMS - Healthcare Artifact and Image Management Solution
  - Software application that will enable clinicians to view radiology images (low resolution)
- Creation of a mirrored, unified, PACS archive server
- Implementation of radiation dose monitoring software

Summary

- DOD required to maintain a longitudinal health record
- EHR must overcome numerous challenges
- DOD EHR is comprised by a complex set of complimentary systems
- DOD Radiology heavily dependent on Teleradiology