ROLE OF SPECIALTY MEDICINE IN KNOWLEDGE ENGINEERING

CURATING CLINICAL KNOWLEDGE IN THE AGE OF ML AND AI?

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NO DISCLOSURES
WHY KNOWLEDGE ENGINEERING:
SURGICAL CARE HAS CHANGED
OVER THE YEARS
SPECIALTY SOCIETY ROLES

• Continuing Education
• National Standards
• Registries
• Clinical Guidelines
• Advocacy
• Journal Sponsor
• National Policies
• Intermediary with government agencies
• Quality Measures
• Digital Healthcare & Services
Data about an individual is growing relentlessly.

Schematic contrasting human cognitive capacity (e.g., the number of sets of facts the brain can correlate in a decision) with the explosion of new biomedical data types. SNP indicates single nucleotide polymorphism. The authors adapted this figure with permission from Stead.

Source
Biomedical Informatics: Changing What Physicians Need to Know and How They Learn

William Stead, et al
MODERN CARE NEEDS
SYSTEMS ENGINEERING AND ALIGNMENT

Care Model
Resources
Quality Program
Shared Knowledge
Business Model
Compensation
WHY:
ORCHESTRATING COMPLEXITY MEANS CURATING KNOWLEDGE INTO VALUE

• Care Model
  • Define a patient’s care journeys are lengthy, complex continuums
  • Surgeon as the maestro orchestrating team-based care
  • Aggregate the disaggregated across sites (Office, ASCs, Complex facilities, SNF, Rehab, HH)

• Resource Model
  • Staffing, Available technologies and devices, digital science in EHRs and clouds

• Quality Model
  • Structure, Process, Outcomes, Appropriateness, Patient Experience

• Knowledge Model
  • Data & Dashboards
  • Conformance with guidelines (CPG)
  • CDS

• Business Model
  • Revenues, Move to Alternative Payment models with Value (Bundles, Episodes and ACOs)

• Clinical Compensation Model
  • Once self employed, volume drove compensation; now value to the patient & team drives compensation
SILOS OF SURGICAL CARE

Now, in 2020, EVERYTHING is different
Surgical care is highly specialized
From Prehab to OR to Rehab
In silos
Un-orchestrated complexity
Prone to mishaps, complications and preventable harms.
GOVERNMENT IS NO LONGER JUST A PURCHASER & PAYOR

- HHS
- CMS
- ONC
- CDC
- AHRQ
- FDA
- NIH
- NCI

Each agency has contributions to healthcare. More and more they are entering into clinical medicine and clinical workflows. Knowledge management and engineering are of increasing importance.

Quality Outcomes
Price Transparency
Value Transparency
Patient Reported Outcomes

What role do specialties play within the government relationships?
• Building teams for surgical care
• Verifying team structure and processes are in place
• Assuring the data model informs the care team in real-time.

Providing in **workflow solutions** as a digital services for patients and surgeons within the modern surgical team.

• This means leveraging digital services in platforms which interface with the surgical team in their workflows.
ASSURING STRUCTURAL AND PROCEDURAL INTEGRITY THRU VERIFICATION PROGRAMS

Verification Programs
- Trauma
- Cancer
- Bariatrics
- Geriatrics
- Vascular
- Pediatric Surgery
- Complex GI

Verification Domains
- Institutional Admin Commitment
- Scope & Governance
- Facilities & Equipment Resources
- Personnel & Services Resources
- Patient Care: Expectations & Protocols
- Data Services & Systems
- Quality Improvement
- Professional & Community Outreach
- Research: Bench & Clinical Trials
HOW:
ON SITE VERIFICATION

Geriatric Surgery Verification Program
Quick Reference Guide

1: Institutional Administrative Commitment
   1.1 Letter of Support

2: Scope & Governance
   2.1 Geriatric Surgery Director
   2.2 Geriatric Surgery Coordinator
   2.3 Geriatric Surgery Quality Committee

3: Facilities & Equipment Resources
   3.1 Geriatric-Friendly Patient Rooms

4: Personnel & Services Resources
   4.1 Geriatric Surgery Nurse Champion

5: Patient Care: Expectations & Protocols
   5.1 Treatment & Overall Health Goals
   5.2 Code Status & Advance Directive
   5.3 Medical Proxy
   5.4 Life-sustaining Treatment Discussion for Patients with Planned ICU Admission
   5.5 Reaffirm Surgical Decision-Making
   5.6 Geriatric Vulnerability Screens
   5.7 Management Plan for Patients with Positive Geriatric Vulnerability Screens
   5.8 Interdisciplinary Input or Conference for Elective, High-Risk Patients
   5.9 Surgeon-PCP Communication for Inactive, High-Risk Patients
   5.10 Return of Personal Sensory Equipment
   5.11 Inpatient Medication Management
   5.12 Opioid Sparing, Multimodality Pain Management
   5.13 Standardized Post-Operative Care
   5.14 Interdisciplinary Care for High-Risk Patients
   5.15 Revisiting Goals of Care for ICU Patients
   5.16 Assessment of Geriatric Vulnerabilities at Discharge
   5.17 Discharge Documentation & Hand-Off Communication
   5.18 Communication with Post-Acute Care Facilities

6: Data Surveillance & Systems
   6.1 Data Collection & Review
   6.2 Data Feedback to Frontline Providers and Quality Infrastructure

7: Quality Improvement
   7.1 Geriatric Surgery Quality Improvement (QII) / Process Improvement (PI) Project
   7.2 (optional) Geriatric NSQIP Collaborative

8: Professional & Community Outreach
   8.1 Geriatric Surgery Community Outreach Project
   8.2 Geriatric Education of Surgeons and Advanced Practice Providers (APPs)
   8.3 Geriatric Education of Nurses

9: Basic & Clinical Trials
   9.1 (optional) Advancement of Knowledge in Geriatric Surgical Care
Decision Model & Notation

Case Management Model & Notation

Business Process Model & Notation
ACCS Digital Services for Cancer Care

Seek to provide a digital framework for information sharing to all stakeholders in cancer care.

Knowledge artifacts will support efforts:

1. Modern staging (inclusions beyond TNM, such as genomics)
2. Structured Data Capture of surgical Op reports and anatomic pathology reports
3. Dynamically fit known therapies to the stage in clinical workflows, (e.g. NCCN)
4. Inform Tumor Boards for care design
5. Track care and its appropriateness
6. Track completeness of care delivery
7. Track outcomes
8. Performance long-term surveillance and survival
BPMN & REGISTRIES
INFORMING CARE IN A VALUE BASED FUTURE
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Gathering the knowledge artifacts from multiple sources – EHRs, HIEs, registries, patient inputs, etc.

Standardizing the inputs for developing shared knowledge allows for informed decisions and informed care.
Care can move beyond the “walls” and Silos of single institutions.

Care can be fashioned to meet patient needs and optimize value.
WORKFLOWS FOR MULTI-STAKEHOLDERS

• Focus curating knowledge around the surgical patient for a given condition.
• Patients, their condition(s), the treatment and outcomes are the focal point.
• Gather data in standardized forms into a common data model (beyond the EHRS in layers of clouds) for digital services to deliver to the clinical workflows in EHRs
• Use FHIR to aid in gathering data, assembling and curating knowledge and redelivery of data into clinical workflows.
ACS CANCER DIGITAL SERVICES PILOT

• Develop BPM+ conformant notations for cancer care
• Build synoptic report for surgical care for standardized data capture
• Align with Pathology (CAP), Radiology (ACR), and Clinical Oncology (ASCO) for shared structured data capture
• Demonstrate the ability to capture current AJCC stage in structured data with amendments from CAP and ACR and deliver digital services using open standards to clinical registries and to EHRs in clinical workflows.
WE ARE JUST AT THE START OF THE BEGINNING

• As modern healthcare evolves –

• We must address the volume of knowledge artifacts and the limits of man in managing the volume.

• We need to leverage digital services in creating shared knowledge across the care continuum and all the sites included in the care model.

• In workflow solutions must be trusted, reliable, valid and current.

• Digital services will need to meet govt standards (CMS, ONC, CDC, FDA, etc).

• Specialties serve as an ideal resource for SME content engineering to join with the technology sector.
• Digital Services are needed across the entire spectrum of conditions related to surgical care (Trauma, Bariatrics, Cancer, Vascular, Geriatrics, Pediatrics, etc)

• Building digital services into the systems re-engineering of healthcare is its own science (Systems Engineering)

• Understanding the business case for building better value into care and using payment as a lever to further advance digital services inside healthcare means moving interoperability beyond a technical assessment into a clinical assessment. (Behavioral Economics)

• Education for the why, what and how of curating knowledge in healthcare requires retooling undergraduate, graduate education and lifelong learning (Medical School, GME and MOC)
STAY TUNED