HEALTHCARE DOMAIN NOTES

15.OCT.16

SUMMARY

* To produce a diagram of the domain of healthcare (from a US perspective), upon which can be mapped to the Standard Health Record. This diagram is to be used for the longer term strategy of national SHR adoption. The SHR will ultimately need to show how it’s data elements would fit into the context of each domain/subdomain in order to prove it’s relevance across the healthcare spectrum and promote buy-in across medical specialties.

EXISTING ONTOLOGIES

* U. Washington foundational model of anatomy <http://sig.biostr.washington.edu/projects/fm/AboutFM.html#contents>
  + Model explorer <http://xiphoid.biostr.washington.edu/fma/index.html>
* Disease ontology <http://disease-ontology.org/>
* SNOMED-CT

Several methods of organizing the domain of healthcare:

1. Organize by specialty
   1. Good from medical professionals perspective. “how does the SHR relate to my professional practice?”
2. Organize by disease (disease ontology)
   1. Good from a consumer perspective. patients are interested in measures related to conditions they have
3. Organize by anatomy/body system
4. Organize by healthcare setting
5. Organize by health scenario/use case
6. Medical specialties can be organized along surgical vs internal medicine, age range of patients, diagnostic vs therapeutic, organ-based vs technique-based

BY HEALTH PROFESSIONAL

* Mental health practitioners
* Maternal and newborn health practitioners
* Geriatric care practitioners
* Surgical practitioners
* Rehabilitation care practitioners
* Eye care practitioners
* Medical diagnosis providers
* Oral care practitioners
* Foot care practitioners
* Public health practitioners

BRANCHES OF HEALTH SCIENCES

* Addiction medicine
* Allergic disease
* Anesthesiology
* Angiology
* Audiology
* Cardiology
* Dentistry
* Dermatology
* Endocrinology
* Genetic counselling
* Gastroenterology
* Gynecology
* Hematology
* Hepatology
* Immunology
* Infectious disease + virology
* Kinesiology + exercise physiology
* Medical physics
* Medical technology
* (Medicine)
* Midwifery
* Nephrology
* Neurology
* Nursing
* Nutrition + dietetics
* Obstetrics
* Occupational therapy
* Oncology
* Ophthalmology
* Optometry
* Orthopedics
* Otorhinolaryngology
* Pathology
* Pharmacology
* Pharmacy
* Physical therapy (physiotherapy)
* Physiology
* Psychotherapy + cognitive therapy
* Psychiatry
* Podiatry
* Population health and public health + epidemiology
* Pulmonology
* Radiology
* Rheumatology
* Sleep medicine
* Speech-language pathology
* Social work
* Surgery
* Urology

BY SPECIALTY (from physician perspective)

The following organization is based on the American Board of Medical Specialties <http://www.abms.org/member-boards/specialty-subspecialty-certificates/>. In this organization there are 24 boards (American board of anesthesiology, American board of family medicine, etc), 37 general certifications and ~128 subspecialty certifications. The con is that it’s only in reference to the physician domain. Organized by board (# of subspecities) 🡪 general certificates.

* Allergy and Immunology
* Anesthesiology (5 subspecialties)
* Colon and Rectal Surgery
* Dermatology (2 subspecialties)
* Emergency medicine (9 subspecialties)
* Family medicine (6 subspecialties)
* Internal medicine (20 subspecialties)
* Medical genetics and genomics (2 subspecialties)
  + Clinical biochemical genetics
  + Clinical cytogenetics and genomics
  + Clinical genetics and genomics
  + Clinical molecular genetics and genomics
* Neurological surgery
* Nuclear medicine
* Obstetrics and gynecology (6 subspecialties)
* Ophthalmology
* Orthopaedic surgery (2 subspecialties)
* Otolaryngology (4 subspecialties)
* Pathology (11 subspecialties)
  + Pathology – anatomic/pathology-clinical
  + Pathology – anatomic
  + Pathology - clinical
* Pediatrics (19 subspecialties)
* Physical medicine and rehabilitation (7 subspecialties)
* Plastic surgery (2 subspecialties)
* Preventive medicine
  + Aerospace medicine (4 subspecialties)
  + Occupational medicine
  + Public health and general preventive medicine
* Psychiatry and neurology (14 subspecialties)
  + Psychiatry
  + Neurology
  + Neurology with special qualification in child neurology
* Radiology (6 subspecialties)
  + Diagnostic radiology
  + Interventional radiology and diagnostic radiology
  + Radiation oncology
  + Medical physics
* Surgery (5 subspecialties)
  + Surgery
  + Vascular surgery
* Thoracic surgery (1 subspecialties)
* Urology (2 subspecialties)

BY SPECIALTY GROUPS:

Can organize medical specialties by surgical (focus on manually operative and instrumental techniques to treat disease), medical (focus on the diagnosis and non-surgical treatment of disease), diagnostic (focus more purely on diagnosis of disorders). Based off wiki reference (which doesn’t list an original source..). specialty group 🡪 specialty 🡪 sub specialties

* Surgery
  + Anesthesia
    - pediatric anesthesia, pain management, intensive care, critical care, obstetrics and gynaecology, cardiothoracic anesthesiology, trauma care, pre and post operative assessment and care, generalist
  + Obstetrics and gynecology
    - Maternal-fetal medicine, reproductive medicine, fertility medicine, gynecologic oncology
  + Cardiovascular surgery
  + General surgery
    - Colorectal surgery, gastrointestinal surgery, transplant surgery, trauma surgery
  + Neurosurgery
    - Cerebrovascular, neurosurgical oncology, stereotactic and functional, spine, neurotrauma, skull base, peripheral nerve, pediatric neurosurgery
  + Ophthalmology
    - Retina cornea
  + Oral and maxillofacial surgery
    - Oral and craniofacial surgery, facial cosmetic surgery, craniomaxillofacial trauma
  + Otorhinolaryngology
    - Head and neck, facial cosmetic surgery, neurotology, laryngology
  + Pediatric surgery
  + Plastic surgery
    - Cosmetic surgery, burn, microsurgery, hand surgery, craniofacial surgery
  + Podiatry
    - Forefoot surgery, midfoot surgery, rearfoot surgery, ankle surgery, soft tissue leg surgery
  + Surgical oncology
  + Thoracic surgery
  + Transplant surgery
  + Urology
  + Vascular surgery
* Medicine
  + Geriatrics
  + Cardiology
  + Dermatology
  + Emergency medicine
    - Disaster medicine, emergency medical services, hospice and palliative medicine, international emergency medicine and global health, medical toxicology, pediatric emergency medicine, research, simulation, sports medicine, toxicology, ultrasound, undersea and hyperbaric medicine, wilderness medicine
  + Endocrinology
  + Family medicine
    - Adolescent medicine, geriatric medicine, hospice and palliative medicine, sleep medicine, sports medicine
  + Forensic medicine
  + Gastroenterology
  + Hepatology
  + Infectious disease
  + Intensive care medicine
  + Nephrology
  + Neurology
    - Behavioral neurology, clinical neurophysiology, geriatric neurology, headache medicine, neuromuscular medicine, neurodevelopmental disabilities, neuro-oncology, neuroradiology, vascular neurology, hospice and palliative medicine, pain medicine, sleep medicine
  + Oncology
    - Radiation oncology
  + Palliative care
  + Pediatrics
    - (most sub-specialties of adult medicine have a pediatric equivalent – pediatric cardiology, pediatric emergency medicine, etc)
  + physical medicine and rehabilitation
  + proctology
  + psychiatry
    - child and adolescent psychiatry, geriatric psychiatry, addiction psychiatry, forensic psychiatry, neuropsychiatry, sleep medicine, psychosomatic medicine, hospice and palliative medicine, pain medicine
  + pulmonology
  + rheumatology
  + urgent care medicine
* diagnostic
  + radiology
    - interventional radiology, nuclear medicine
  + clinical laboratory sciences
    - transfusion medicine, cellular pathology, clinical chemistry, hematology, clinical microbiology, clinical immunology
  + pathology
* (non-categorized)
  + allergy and immunology
  + dietetics
  + gynecology
  + medical research
    - anatomy, biochemistry, embryology, genetics, pharmacology, toxicology
  + stomatology
    - dentistry

BY SPECIALTY (from general occupation perspective)

A list of all healthcare occupations in the US can be found via the Bureau of Labor Statistics. Each occupation has it’s own subspecialties and focuses. A con to this is that the macro categorization is arbitrary in terms of having even distribution of representation (there are more dentists than there are audiologists, etc). Another issue is the overlap between professions (a physician assistant can work in many domains in healthcare that each focus on different aspect of health). Organized by: BLS occupation 🡪 specialty 🡪 subspecialty

* Physicians and surgeons
* Dentists
* Pharmacists
* Podiatrists
* Nurse anesthetists, nurse midwives, nurse practitioners
* Optometrists
* Physician assistants
* Physical therapists
* Radiation therapists
* Occupational therapists
* Audiologists
* Speech-language pathologists
* Nuclear medicine technologists
* Dental hygienists
* Genetic counselors
* Occupational health and safety specialists
* Registered nnurses
* Chiropractors
* Orthotists and prosthetists
* Diagnostic medical sonographers and cardiovascular technologists and technicians, including vascular technologists
* Radiologic and MRI technologists
* Dietitians and nutritionists
* Respiratory therapists
* Occupational therapy assistants and aides
* Medical and clinical laboratory technologists and technicians
* Occupational health and safety technicians
* Exercise physiologists
* Recreational therapists
* Athletic trainers
* Surgical technologists
* Licensed practical and licensed vocational nurses
* Physical therapist assisatns and aides
* Massage therapists
* Medical records and health information technicians
* Dental assistants
* Medical transcriptionists
* Opticians, dispensing
* EMTs and paramedics
* Phlebotomists
* Medical assistants
* Pharmacy technicians
* Psychiatric technicians and aides
* Nursing assistants and orderlies
* Home health aides

BY ORGAN SYSTEM

Based on the U. Washington foundational model of anatomy. Organ system 🡪 regional part organ system 🡪

* Alimentary system
* Cardiovascular system
* Deep fascial system
* Genital system
* Integumentary system
* Musculoskeletal system
* Nervous system
* Respiratory system
* Urinary system

Body part 🡪 regional part 🡪 constitutional part

* Head
  + Face
    - Left eyeball
    - Musculature of face
    - etc
  + Head proper
* Body proper
  + Neck
  + Thoracic segment of trunk
  + Abdominal segment of trunk
  + perineum
* Right upper limb
  + Right pectoral girdle
  + Right free upper limb
  + Right arm
  + Right forearm
  + Right hand
* Right lower limb
  + Right pelvic girdle
  + Right free lower limb
  + Right thigh
  + Right leg
  + Right foot
* Left upper limb
* Left lower limb

INTERNATIONAL CLASSIFICATION OF HEALTH WORKERS (WHO)

* Health professionals
  + Generalist medical practitioners
  + Specialist medical practitioners
    - Obstetric and gynaecological
    - Paediatrics
    - Psychiatric
    - Medical group of specialties
    - Surgical group of specialties
  + Nursing
  + Midwifery
  + Paramedical
  + Dentists
  + Pharmacists
  + Environment and occupational and hygiene
  + Physiotherapists
  + Dieticiand and nutritionist
  + Audiologists and speech therapists
  + Optometrists and ophthalmic opticians
* Health associate professionals
  + Medical imaging and therapeutic equipment technicians
  + Medical and pathology lab technicians
  + Pharmaceutical technicians
  + Medical and dental prosthetic technicians
  + Nursing associate professionals
  + Midwifery associate professionals
  + Dental assistants and therapists
  + Medical records and health information technicians
  + Community health workers
  + Dispensing opticians
  + Physiotherapy technicians and assistants
  + Medical assistants
  + Environmental and occupational health inspectors
  + Ambulance workers
* Personal care workers in health services
  + Health care assistants
  + Home-based personal care workers
* Health management and support
  + Health service managers
  + Life science professionals
  + Social work and counseling
  + Life science technicians
  + Medical secretaries
  + Clerical support workers

Questions:

1. Are medical professionals more interested in searching through the composition of medical records in terms of the professional specialty/role they have, or by the clinical scenarios they are interested in? (if there is a lot of variance in the scenarios that clinicians see within even their own specialty, then maybe scenario is the way to go, which could depend on specialty. If they don’t, then maybe organize by specialty)

REFERENCES

1. <http://sig.biostr.washington.edu/projects/fm/FME/aboutFME.html>
2. <http://disease-ontology.org/>
3. <http://www.abms.org/member-boards/specialty-subspecialty-certificates/>
4. <http://www.bls.gov/ooh/healthcare/home.htm>
5. <https://en.wikipedia.org/wiki/Specialty_(medicine)>
6. <https://en.wikipedia.org/wiki/Health_professional>
7. <https://en.wikipedia.org/wiki/Outline_of_health_sciences>
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