

Terms, Codes and Classification

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Why we Need Standards in healthcare?

- ❖ **We need standards when there is high diversity between**
 - ❖ Systems
 - ❖ Terminology
 - ❖ Record formats

- ❖ **We need standards in healthcare because**
 - ❖ Healthcare is distributed
 - ❖ Multiple institutions, departments, and professionals
 - ❖ Healthcare systems are heterogeneous
 - ❖ Lack of co-ordination between different elements
 - ❖ Lot of communication happens between different elements
 - ❖ Message cannot be ambiguous, else we get medical errors
 - ❖ Encoding of patient data that is usable by multiple parties
 - ❖ Correct representation of clinical information
 - ❖ Representation of medical knowledge
 - ❖ Correct identification of healthcare components
 - ❖ Physicians, nurses, machines, drugs

Controlled Terminologies

- ❖ **Medical information needs to be encoded in clinical systems because**
 - ❖ Using a standard vocabulary helps to exchange information
 - ❖ Using a standard vocabulary constrains the language/concept choices
- ❖ **There is no standard terminology yet**

Medical Terminologies

- ❖ **Terms can be used to support recording and reporting a patient's care at varying levels of detail**
 - ❖ diseases,
 - ❖ diagnoses,
 - ❖ findings,
 - ❖ operations,
 - ❖ treatments,
 - ❖ drugs,
 - ❖ administrative items etc.
- ❖ **Clinical vocabularies, terminologies or coding systems, are structured list of terms which together with their definitions are designed to describe unambiguously the care and treatment of patients.**

Common Concepts

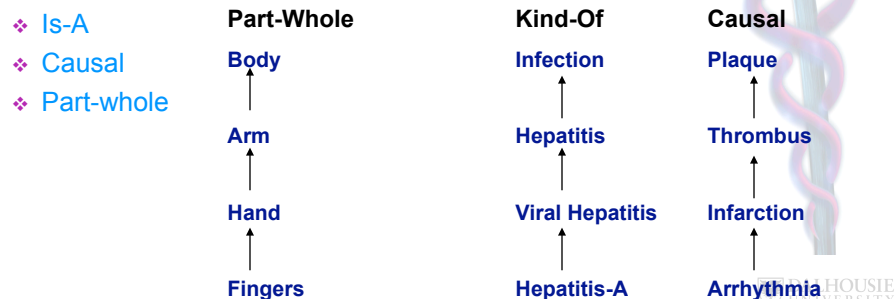
- ❖ **Concept**
 - ❖ A unit of thought constituted by abstraction on the basis of properties common to a set of objects
- ❖ **Term**
 - ❖ A name for the concept in a specified linguistic system
- ❖ **Terminology**
 - ❖ A set of terms representing a particular domain
- ❖ **Nomenclature**
 - ❖ System of terms based on a naming convention
- ❖ **Dictionary**
 - ❖ Structured collected of terms with linguistic information and meaning
- ❖ **Vocabulary**
 - ❖ Dictionary containing the terminology about a subject
- ❖ **Thesaurus**
 - ❖ A vocabulary that relates terms with similar meaning (such as MeSH)

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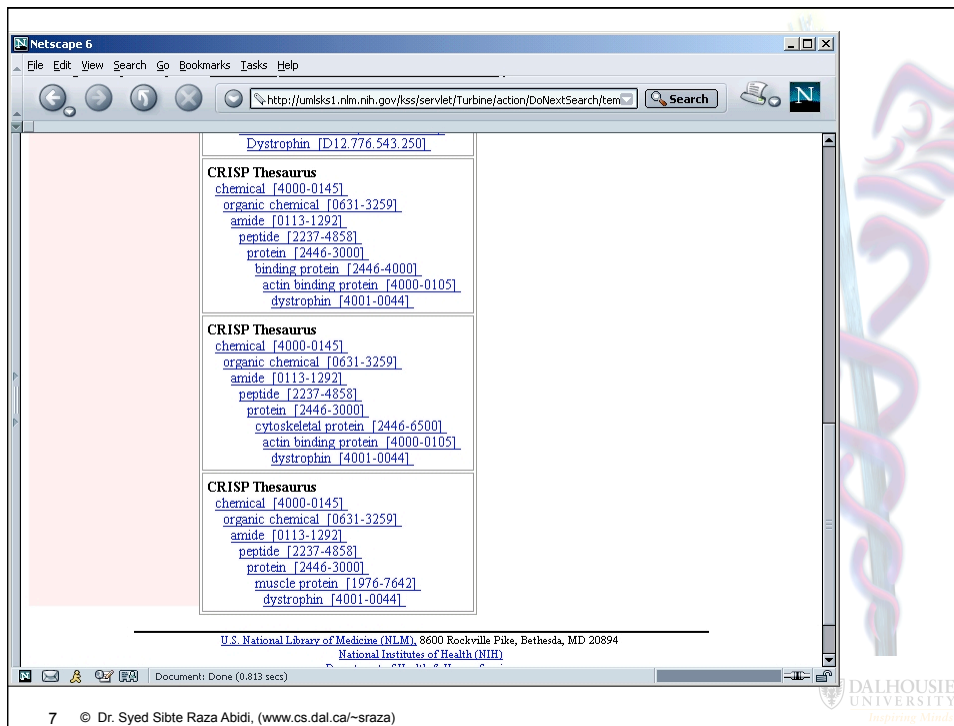
Classification Hierarchies

- ❖ **Classification hierarchies organize terms in a conceptual structure that describes relationships between the terms in the hierarchy**
- ❖ **Meaning of terms is determined by the link between the terms**



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Medical Terminologies

- ❖ **Medical terminologies define a concept as a term**
 - ❖ Each term has special meaning
 - ❖ Diabetes, Angina, Pencillin, Tibia
- ❖ **Medical languages allow the same concepts to be expressed using different terms**
 - ❖ A code describes different concepts in the language
 - ❖ A *group* represents a category of codes

Concept	Term	Code	Group
Breathless	Short of breath	54.213	82
	Breathless		
	Dyspnoea		
Wheeze	Wheeze	54.214	

ICD-10

❖ International Classification of Diseases

- ❖ Published by WHO
- ❖ Now in its 10th edition

❖ Classification Structure

- ❖ Multiple axis classification structure
- ❖ List of 3 alphanumeric character codes
 - ❖ A00 to Z99
- ❖ Additional details (specific forms of the term) are given by a fourth character
 - ❖ A00.1
 - .0 - .7 are used for specific forms; .8 is for other category; .9 is for unspecified category
- ❖ Contains 21 chapters
 - ❖ First character of the ICD code is a letter associated with a chapter
 - ❖ Within chapters, 3-character codes are divided into homogeneous blocks

ICD Example

- ❖ **001 - 139 Infectious and parasitic diseases**
- ❖ **001 - 009 Infectious diseases of the digestive tract**
- ❖ **003 Other Salmonella Infections**
 - ❖ 003.0 Salmonella gastroenteritis
 - ❖ 003.1 Salmonella Septicemia
 - ❖ 003.2 Localized Salmonella Infections
 - 003.20 Localized Salmonella Infection, Unspecified
 - 003.21 Salmonella Meningitis
 - 003.22 Salmonella Pneumonia
 - 003.23 Salmonella Arthritis
 - 003.24 Salmonella Osteomyelitis
 - 003.29 Other Localized Salmonella Infections
 - ❖ 003.8 Other specified Salmonella Infections
 - ❖ 003.9 Salmonella Infections, Unspecified

ICD-10 Chapters

I	Certain infectious and parasitic diseases	A00–B99
II	Neoplasms	C00–D48
III	Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	D50–D89
IV	Endocrine, nutritional and metabolic diseases	E00–E90
V	Mental and behavioural disorders	F00–F99
VI	Diseases of the nervous system	G00–G99
VII	Diseases of the eye and adnexa	H00–H59
VIII	Diseases of the ear and mastoid process	H60–H95
IX	Diseases of the circulatory system	I00–I99
X	Diseases of the respiratory system	J00–J99
XI	Diseases of the digestive system	K00–K93
XII	Diseases of the skin and subcutaneous tissue	L00–L99
XIII	Diseases of the musculoskeletal system and connective tissue	M00–M99
XIV	Diseases of the genitourinary system	N00–N99
XV	Pregnancy, childbirth and the puerperium	O00–O99
XVI	Certain conditions originating in the perinatal period	P00–P96
XVII	Congenital malformations, deformations, and chromosomal abnormalities	Q00–Q99
XVIII	Symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified	R00–R99
XIX	Injury, poisoning and certain other consequences of external causes	S00–T98
XX	External causes of morbidity and mortality	V01–Y98
XXI	Factors influencing health status and contact with health services	Z01–Z99

ICD 10

❖ <http://www.nzhis.govt.nz/documentation/codetables/nmdstab22.html>

Diagnosis Related Groups (DRG)

- ❖ **DRG relate patient diagnosis to cost of treatment**
 - ❖ Designed to calculate federal reimbursement for care delivered under the medicare system
- ❖ **Each DRG represents a diagnosis or procedure**
 - ❖ Based on ICD
 - ❖ Provide a relatively small number of codes for classifying patient hospitalizations
- ❖ **Each DRG gives a cost weight to a diagnosis or procedure**
 - ❖ Based on a formula to determine amount that should be paid to an institution for a patient
- ❖ **DRG determine an institution's CASE-MIX**
 - ❖ Types of patient an institution sees
 - ❖ Severity of the diseases that the institution encounters
 - ❖ Hospital seeing the same number of patients as another hospital but of a higher severity will have a higher case-mix index

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DRG Example

- ❖ **481 Pneumococcal Pneumonia (ICD)**
- ❖ **75 Respiratory disease w/ major chest operating room procedure, no major complication or comorbidity**
- ❖ **76 Respiratory disease w/ major chest operating room procedure, minor**
- ❖ **77 Respiratory disease w/ respiratory system operating procedure, no complication or comorbidity**
- ❖ **79 Respiratory infection w/ minor complication, age > 17**
- ❖ **80 Respiratory infection w/ no minor complication, age > 17**
- ❖ **475 Respiratory disease w/ ventilator support**
- ❖ **538 Respiratory disease w/ major chest operating room procedure and major complication or comorbidity**

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Diagnosis Related Groups

❖ Classification Structure

- ❖ Patients are initially assigned an ICD-10 CM code
 - ❖ ICD-10 CM is closely related to ICD-10
- ❖ Diagnosis are partitioned into one of the 23 Major Diagnostic Categories (MDC) according to body organ or disease
- ❖ Codes are next partitioned on
 - ❖ Performance of procedures
 - ❖ Presence of complications
 - ❖ Patient age
 - ❖ Length of stay
- ❖ ICD --> MDC --> DRG

MDC

1. # Diseases and disorders of the nervous system
2. # Diseases and disorders of the eye
3. # Diseases and disorders of the ear, nose & throat
4. # Diseases and disorders of the respiratory system
5. # Diseases and disorders of the circulatory system
6. # Diseases and disorders of the digestive system
7. # Diseases and disorders of the hepatobiliary system and pancreas
8. # Diseases and disorders of musculoskeletal system and connective tissue
9. # Diseases and disorders of the skin, subcutaneous tissue and breast
10. # Endocrine, nutritional and metabolic diseases and disorders
11. # Diseases and disorders of the kidney and urinary tract
12. # Diseases and disorders of the male reproductive system
13. # Diseases and disorders of the female reproductive system
14. # Pregnancy, childbirth and the puerperium
15. # Newborns and other neonates with conditions originating in the perinatal period
16. # Diseases & disorders of blood & blood forming organs & immunological disorders
17. # Myeloproliferative diseases and disorders, and poorly differentiated neoplasms
18. # Infectious and parasitic diseases
19. # Mental diseases and disorders
20. # Substance use and substance induced organic mental disorders
21. # Injuries, poisonings and toxic effects of drugs
22. # Burns
23. # Factors influencing health status & other contacts with health services
24. # Ungrouped

	Without microwave surgical ablation	With microwave surgical ablation ¹
CABG	With catheterization with MCV (28%) → DRG 547 \$31,916	DRG 108 \$30,289
	With catheterization without MCV (28%) → DRG 548 \$24,317	DRG 108 \$30,289
	Without catheterization with MCV (12%) → DRG 549 \$26,266	DRG 108 \$30,289
	Without catheterization without MCV (29%) → DRG 550 \$18,625	DRG 108 \$30,289
	With PTCA (3%) → DRG 106 \$36,243	DRG 108 \$30,289
	Weighted average: \$25,391	\$30,289
* CABG reimbursement increases approximately \$4,900 when performed concomitant with microwave surgical ablation.		
Valve	With catheterization (40%) → DRG 104 \$42,351	DRG 104 \$42,351
	Without catheterization (60%) → DRG 105 \$31,012	DRG 105 \$31,012
MW Surgical Ablation		DRG 108 \$30,289
* Reimbursement for surgical ablation is higher than catheter ablation (DRG 518 = \$8,524).		

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READ Codes

- ❖ Coding system to code clinical terms in primary care
- ❖ Works as a thesaurus of clinical terms.
- ❖ Each concept has a

- ❖ preferred term **Acute myocardial infarction**
- ❖ synonyms **Heart attack, Coronary thrombosis**
- ❖ acronyms **MI**
- ❖ abbreviations **G30..**
- ❖ unique 5 digit alphanumeric code

- ❖ READ Codes map to ICD-10

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READ Codes

- ❖ Read codes are arranged hierarchically, with the level of detail increasing down the hierarchy

G....	Circulatory system diseases	First level
G3...	Ischaemic heart disease	Second level
G30..	Acute myocardial infarction	Third level
G301.	Anterior myocardial infarction NOS	Fourth level
G3011	Acute anteroseptal infarction	Fifth level

READ Codes : Chapters

❖ Occupations	0
❖ History and symptoms	1
❖ Examination and signs	2
❖ Diagnostic procedures	3
❖ Laboratory procedures	4
❖ Radiology and physics in medicine	5
❖ Preventive procedures	6
❖ Operations, procedures, sites	7
❖ Other therapeutic procedures	8
❖ Administration	9
❖ Infectious and parasitic diseases	A
❖ Neoplasms	B
❖ Endocrine, nutritional, metabolic and immunity disorders	C
❖ Diseases of blood and blood-forming organs	D
❖ Mental disorders	E
❖ Nervous system and sense organ diseases	F
❖ Circulatory system diseases	G
❖ Respiratory system diseases	H
❖ Digestive system diseases	J
❖ Genitourinary system diseases	K
❖ Complications of pregnancy, childbirth and the puerperium	L
❖ Skin/subcutaneous tissue diseases	M
❖ Musculoskeletal and connective tissue diseases	N
❖ Congenital anomalies	P
❖ Perinatal conditions	Q
❖ [D] Symptoms, signs and ill-defined conditions	R
❖ Injury and poisoning	S
❖ Causes of injury and poisoning	T
❖ [X] External causes of morbidity and mortality	U
❖ Unspecified conditions	Z

Variations in Medical Terms

Clinical Concept	UMLS	ICD10	READ	SNOMED CT
Chronic ischaemic heart disease	448589 Chronic ischaemic heart disease	I25.9 Chronic ischaemic heart disease	XE0WG Chronic ischaemic heart disease NOS	84537008 Chronic ischaemic heart disease
Epidural haematoma	453700 Hematoma, epidural	S06.4 Epidural haemorrhage	Xa0AC Extradural haematoma	68752002 Nontraumatic extradural haemorrhage
Common Cold	1013970 Common cold	J00 Acute nasopharyngitis [common cold]	XE0X1 Common cold	82272006 Common cold
Lympho-sarcoma	1095849 Lymphoma, diffuse	C85.0 Lymphosarcoma	B601z Lymphosarcoma	1929004 Malignant lymphoma, non-Hodgkin

Amino Acids, Peptides, and Proteins [D12]

Proteins [D12.776]

Contractile Proteins [D12.776.210]

Muscle Proteins [D12.776.210.500]

[Actinin](#) [D12.776.210.500.095]

[Actins](#) [D12.776.210.500.100]

[Actomyosin](#) [D12.776.210.500.154]

[Calsequestrin](#) [D12.776.210.500.220]

▶ [Dystrophin](#) [D12.776.210.500.250]

[Myogenic Regulatory Factors](#) [D12.776.210.500.570] +

[Myoglobin](#) [D12.776.210.500.588]

[Myosins](#) [D12.776.210.500.600] +

[Parvalbumins](#) [D12.776.210.500.750]

[Ryanodine Receptor Calcium Release Channel](#) [D12.776.210.500.800]

[Tropomyosin](#) [D12.776.210.500.895]

[Troponin](#) [D12.776.210.500.910] +

Amino Acids, Peptides, and Proteins [D12]

Proteins [D12.776]

Cytoskeletal Proteins [D12.776.220]

[Adenomatous Polyposis Coili Protein](#) [D12.776.220.040]

▶ [Dystrophin](#) [D12.776.220.250]

[Intermediate Filament Proteins](#) [D12.776.220.475] +

[Microfilament Proteins](#) [D12.776.220.525] +

[Microtubule Proteins](#) [D12.776.220.600] +

[Spectrin](#) [D12.776.220.980]

[Talin](#) [D12.776.220.985]

[Vinculin](#) [D12.776.220.990]

MeSH Browser



Amino Acids, Peptides, and Proteins [D12]

Proteins [D12.776]

Membrane Proteins [D12.776.543]

[Ankyrins](#) [D12.776.543.080]

[Arrestins](#) [D12.776.543.090] +

[Bacterial Outer Membrane Proteins](#) [D12.776.543.100] +

[Caveolins](#) [D12.776.543.160]

[Clathrin](#) [D12.776.543.200]

[Coat Protein Complex I](#) [D12.776.543.212] +

[Connexins](#) [D12.776.543.225] +

▶ [Dystrophin](#) [D12.776.543.250]

[Heterotrimeric GTP-Binding Proteins](#) [D12.776.543.325] +

[LDL-Receptor Related Protein-Associated Protein](#) [D12.776.543.475]

[Membrane Glycoproteins](#) [D12.776.543.550] +

[Membrane Transport Proteins](#) [D12.776.543.585] +

[Myelin Proteins](#) [D12.776.543.620] +

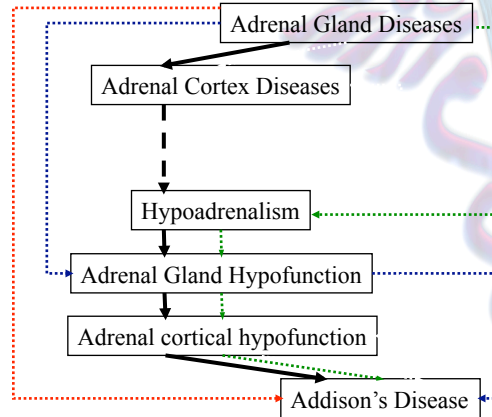
[Neurofibromin 2](#) [D12.776.543.685]

[Receptors, Cell Surface](#) [D12.776.543.750] +

[Spectrin](#) [D12.776.543.980]

Terminology Integration

SNOMED
MeSH
Read Codes
UMLS



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Language Solution

Unified Medical Language System (UMLS)

- ❖ Developed at National Library of Medicine (NLM)
- ❖ Facilitates the development of computer systems that "understand" the language of biomedicine and health.
- ❖ UMLS Knowledge Sources (databases) and software tools (programs).
- ❖ Knowledge Sources are multi-purpose and are used in systems that perform diverse functions
 - ❖ Information retrieval
 - ❖ Indexing of scientific literature and guidelines
 - ❖ Interoperability between patient data systems
- ❖ Integrates some 60 terminological resources
 - ❖ Clinical vocabularies (including specialties)
 - ❖ Core terminologies (anatomy, drugs, med. devices)
 - ❖ Administrative terminologies, standards

❖ <http://www.nlm.nih.gov/research/umls/umlsdoc.html>

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UMLS Components

- ❖ **Metathesaurus**
 - ❖ A large multi-lingual vocabulary database that contains information about biomedical and health-related concepts, their various names, and the relationships among them
- ❖ **Semantic Network**
 - ❖ A consistent categorization of all concepts represented in the Metathesaurus
 - ❖ A set of useful relationships between these concepts
- ❖ **UMLS Knowledge Source Server**
 - ❖ A set of Web-based interactive tools and a programmer interface that allows users and developers to access the UMLS Knowledge Sources, including the vocabularies within the Metathesaurus.
 - ❖ Contains the download site for the UMLS data files.
 - ❖ A useful starting point for gaining an understanding of the content of the UMLS resources..

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UMLS

- ❖ **Semantic Groups - 13**
 - ❖ <http://semanticnetwork.nlm.nih.gov/SemGroups/SemGroups.txt>
- ❖ **Semantic Types**
 - ❖ Around 135 Semantic types
 - ❖ http://www.nlm.nih.gov/research/umls/META3_current_semantic_types.html

Semantic Type Groups	No. Types	UMLS Concepts	
		No.	%
Activities & Behaviors	9	3224	4 %
Anatomy	11	34,386	4.7 %
Chemicals & Drugs	26	356,211	48.8 %
Concepts & Ideas	12	17,639	2.4 %
Devices	2	31,092	4.3 %
Disorders	12	136,389	18.7 %
Genes & Molecular Sequences	5	904	.1 %
Geographic Areas	1	949	.1 %
Living Beings	23	29,699	4.1 %
Objects	5	6,857	.9 %
Occupations	2	890	.1 %
Organizations	4	2,124	.3 %
Phenomena	6	4,943	.7 %
Physiology	9	27,930	3.8 %
Procedures	7	81,847	11.2 %
Totals	134	735,084	100.6 %

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<p>Entity</p> <ul style="list-style-type: none"> Physical Object Organism <ul style="list-style-type: none"> Plant <ul style="list-style-type: none"> Alga Fungus Virus Rickettsia or Chlamydia Bacterium Archaeon Animal <ul style="list-style-type: none"> Invertebrate Vertebrate <ul style="list-style-type: none"> Amphibian Bird Fish Reptile Mammal <ul style="list-style-type: none"> Human Anatomical Structure <ul style="list-style-type: none"> Embryonic Structure Anatomical Abnormality <ul style="list-style-type: none"> Congenital Abnormality Acquired Abnormality Fully Formed Anatomical Structure <ul style="list-style-type: none"> Body Part, Organ, or Organ Component Tissue Cell <ul style="list-style-type: none"> Cell Component Gene or Genome Manufactured Object <ul style="list-style-type: none"> Medical Device Research Device Clinical Drug 	<p>[Entity] (continued)</p> <p>[Physical Object] (continued)</p> <p>Substance</p> <p>Chemical</p> <ul style="list-style-type: none"> Chemical Viewed Functionally <ul style="list-style-type: none"> Pharmacologic Substance <ul style="list-style-type: none"> Antibiotic Biomedical or Dental Material Biologically Active Substance <ul style="list-style-type: none"> Neuroreactive Substance or Biogenic Amine Hormone Enzyme Vitamin Immunologic Factor Receptor Indicator, Reagent, or Diagnostic Aid Hazardous or Poisonous Substance Chemical Viewed Structurally <ul style="list-style-type: none"> Organic Chemical <ul style="list-style-type: none"> Nucleic Acid, Nucleoside, or Nucleotide Organophosphorus Compound Amino Acid, Peptide, or Protein Carbohydrate Lipid <ul style="list-style-type: none"> Steroid Eicosanoid Inorganic Chemical <ul style="list-style-type: none"> Element, Ion, or Isotope Body Substance Food
--	---

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MetaThesaurus

❖ Source Vocabularies

- ❖ Built from the electronic versions of numerous thesauri, classifications, code sets, and lists of controlled terms used in patient care, health services billing, public health statistics, indexing biomedical literature, and/or basic, clinical, and health services research

❖ **The Metathesaurus is organized by concept or meaning**

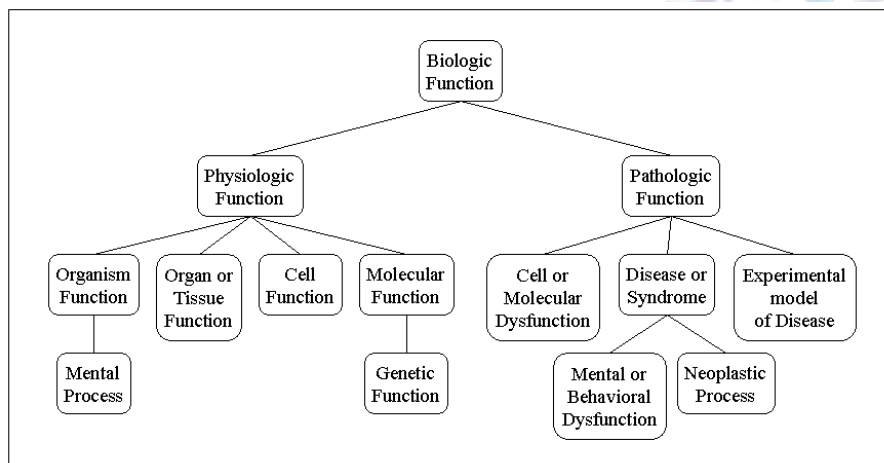
- ❖ Links alternative names and views of the same concept and identifies useful relationships between different concepts.
- ❖ All concepts are assigned at least one Semantic Type from the Semantic Network

Semantic Network

❖ The Semantic Network consists of

- ❖ A set of broad subject categories, or *Semantic Types*
 - ❖ Provide a consistent categorization of all concepts represented in the UMLS Metathesaurus®
- ❖ A set of relationships, or *Semantic Relations*, that exist between Semantic Types
 - ❖ Primary link between the semantic types is the 'isa' link that establishes the hierarchy of types within the Semantic Network
 - ❖ There is also a set of non-hierarchical relationships, which are grouped into five major categories:
 - physically related to
 - spatially related to
 - temporally related to
 - functionally related to
 - conceptually related to
- ❖ Semantic Network details: <http://www.nlm.nih.gov/research/umls/meta3.html>

Semantic Network



Semantic Network

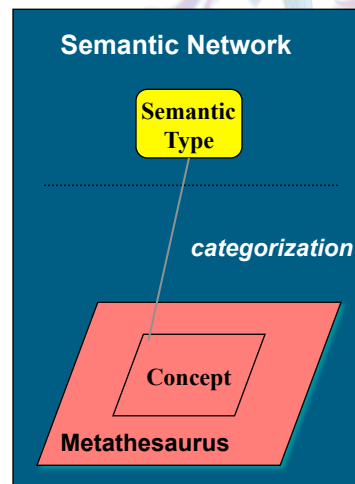
❖ A Portion of the UMLS® Semantic Network

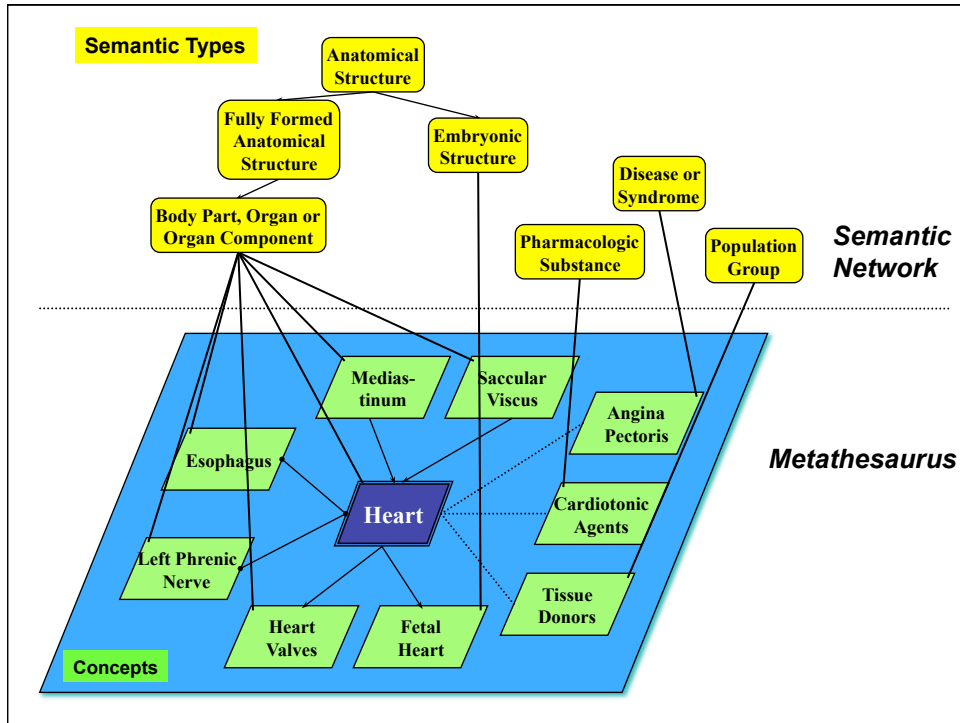
- ❖ http://www.nlm.nih.gov/research/umls/META3_Figure_3.html

UMLS Structure

❖ Two-level structure

- ❖ Semantic Network
 - ❖ 134 Semantic Types
 - ❖ 54 types of relationships among Semantic Types
- ❖ Metathesaurus
 - ❖ 800,000 concepts
 - ❖ ~10 M inter-concept relationships
- ❖ Link = categorization





UMLS Knowledge Source Server (UMLSKS)
Version 2.0.1

Metathesaurus Semantic Network SPECIALIST Lexicon

Search Advanced Search Documentation Resources Views/Profiles Logout

Metathesaurus Search for **dystrophin**

Display

Concept: Dystrophin
CUI: C0079259
Semantic Type: [Amino Acid, Peptide, or Protein](#)
[Biologically Active Substance](#)

Definition:
large, structural, spectrin-like protein expressed in skeletal muscle; genetic defect is linked to Duchenne and Becker muscular dystrophy. (CRISP Thesaurus)

A muscle protein localized in surface membranes which is the product of the Duchenne/Becker muscular dystrophy gene. Individuals with Duchenne muscular dystrophy usually lack dystrophin completely while those with Becker muscular dystrophy have dystrophin of an altered size. It shares features with other cytoskeletal proteins such as SPECTRIN and alpha-actinin but the precise function of dystrophin is not clear. One possible role might be to preserve the integrity and alignment of the plasma membrane to the myofibrils during muscle contraction and relaxation. MW 400 kDa. (MeSH)

Synonyms:
[Dystrophin](#)

Related and possibly synonymous

- Source asserted synonymy
- Allowable Subheadings
- Associated Expressions
- Locator Information

Co-occurring Concepts

- Co-occurring MeSH
- Co-occurring A1/RHEUM

U.S. National Library of Medicine (NLM), 8600 Rockville Pike, Bethesda, MD 20894
National Institutes of Health (NIH)
Department of Health & Human Services

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34 © Dr. Sy Document: Done (0.766 secs)

MeSH

<http://www.nlm.nih.gov/mesh/MBrowser.html>

SNOMED

- ❖ **Concepts:** Over 366,170 concepts with unique meanings and formal logic-based definitions organized into hierarchies.
- ❖ **Descriptions:** Over 993,420 English language descriptions or synonyms for flexibility in expressing clinical concepts
 - ❖ Pain in throat (finding)
 - ❖ Sore throat, Throat pain, Pain in pharynx, Throat discomfort, Pharyngeal pain
- ❖ **Relationships:** Approximately 1.46 million semantic relationships to enable robust reliability and consistency of data retrieval

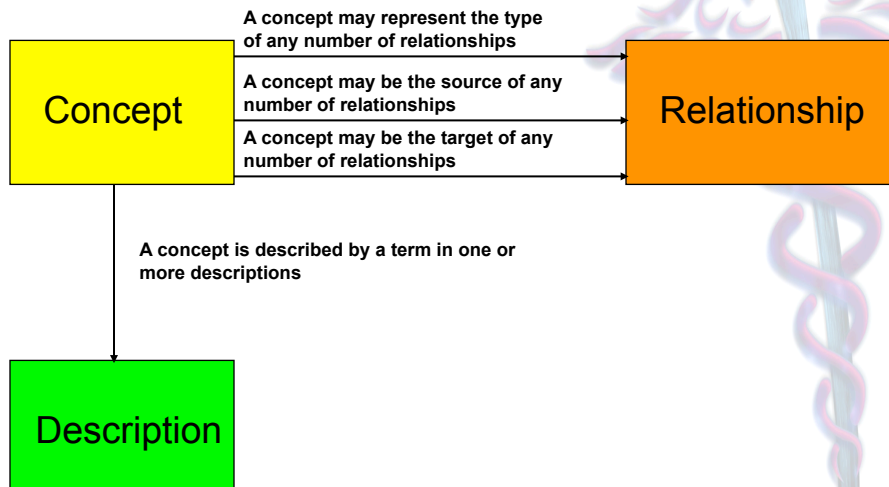
SNOMED Clinical Terms (SNOMED CT)

- ❖ A dynamic, scientifically validated clinical health care terminology and infrastructure that makes health care knowledge more usable and accessible.
- ❖ Provides a common language that enables a consistent way of capturing, sharing and aggregating health data across specialties and sites of care.
- ❖ Applications are:
 - ❖ Electronic medical records, ICU monitoring, clinical decision support, medical research studies, clinical trials, computerized physician order entry, disease surveillance, image indexing and consumer health information services.

SNOMED

- ❖ SNOMED has 11 modules
 - ❖ Topography (T); Morphology (M); Function (F); Diseases/Diagnoses (D); Procedures (P); Occupations (J); Living organisms (L); Chemical, drugs and biological products (C); Physical agents, forces and activities (A); Social context (S); General linkage-modifiers (G)
- ❖ SNOMED has a hierarchical classification system
 - ❖ Terms are assigned to one of the 11 modules
 - ❖ Terms are assigned a 5 or 6 digit alphanumeric code
 - ❖ DE-14800
 - ❖ D = Diseases,
 - E = Infectious or parasitic diseases
 - Bacterial infections
 - Tuberculosis

SNOMED CT CORE STRUCTURE



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SNOMED and UMLS Differences

- ❖ **SNOMED CT and the UMLS Metathesaurus have few differences in their concept models.**
- ❖ **Substance / Product**
 - ❖ SNOMED CT has distinct concepts for drug classes and ingredients .
 - ❖ UMLS Metathesaurus views each of the following pairs as a single concept:
 - ❖ Antacid (substance) and Antacid (product)
 - ❖ Succinimide (substance) and Succinimide (product)
 - ❖ SNOMED CT, they are linked by the relationship "has active ingredient" between the product and the substance.
- ❖ **Morphologic abnormality / Disorder**
 - ❖ SNOMED CT differentiates between morphologic abnormalities and disorders
 - ❖ UMLS Metathesaurus views the following pair as a single concept:
 - ❖ Glomus tumor (morphologic abnormality) and Glomus tumor (disorder)
 - ❖ In SNOMED CT, they are linked by the associated morphology attribute.

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SNOMED and UMLS Differences

- ❖ **SNOMED CT and the UMLS Metathesaurus have few differences in their concept models.**
- ❖ **Finding / {disorder, morphologic abnormality, observable entity}**
 - ❖ SNOMED CT differentiates between findings and disorders, morphologic abnormalities, and observable entities
 - ❖ UMLS Metathesaurus views each of the following pairs as single concepts:
 - ❖ Animal bite (finding) and Animal bite (morphologic abnormality)
 - ❖ Antenatal screening finding (finding) and Antenatal screening finding (observable entity)