

Medizinische Begriffs- und Dokumentationssysteme WS 2000/2001

Unified Medical Language System (UMLS) Teil II

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UMLS Metathesaurus

Speicherung

- Daten des Metathesaurus sind abgelegt in ASCII Relational Format
- Alle Dateinamen beginnen mit MR
- Wird eine Datei größer als 32 MB, wird sie geteilt (z.B. MRCOC01, MRCOC02)

UMLS Metathesaurus

Speicherung

Attribute Relation (File = MRCOLS)

Col.	Description
COL	Column or data element name
DES	Descriptive Name
REF	Documentation Section Number
MIN	Minimum Length, Characters
AV	Average Length
MAX	Maximum Length, Characters
FIL	Physical FILENAME in which this field occurs

Sample Records

ATN|Attribute name||2|2.39|3|MRSAT|

ATV|Attribute value||1|12.31|2221|MRSAT|

ATX|Associated expression||6|40.67|242|MRATX|

mrcon : Concept Information

CON|C0011881|ENG|P|L0011881|PF|S0032315|Diabetic Nephropathies|
CON|C0011881|ENG|P|L0011881|VC|S0367241|Diabetic nephropathies|
CON|C0011881|ENG|P|L0011881|VS|S0223344|DIABETIC NEPHROPATHY|
CON|C0011881|ENG|P|L0011881|VS|S0367237|Diabetic Nephropathy|
CON|C0011881|ENG|P|L0011881|VS|S0417724|diabetic nephropathy|
CON|C0011881|ENG|P|L0011881|VS|S0481288|Diabetic nephropathy|
CON|C0011881|ENG|P|L0011881|VW|S0065985|Nephropathies, Diabetic|
CON|C0011881|ENG|P|L0011881|VWS|S0220067|Diabetic, nephropathy|
CON|C0011881|ENG|P|L0011881|VWS|S0221665|Nephropathy, diabetic|
CON|C0011881|ENG|P|L0011881|VWS|S0390414|Nephropathy, Diabetic|
CON|C0011881|ENG|S|L0011872|PF|S0217817|Diabetes with renal manifest.|
CON|C0011881|ENG|S|L0295966|PF|S0220066|Diabetes, nephropathy|
CON|C0011881|ENG|S|L0387614|PF|S0481273|Diabetes-nephrosis syndrome|
CON|C0011881|ENG|S|L0387614|VW|S0481272|Diabetes, nephrosis syndrome|
CON|C0011881|ENG|S|L0387614|VW|S0513249|Syndrome, diabetes-nephrosis|
CON|C0011881|ENG|S|L0387632|PF|S0481289|Diabetic nephropathy syndrome|
CON|C0011881|FRE|P|L0165921|PF|S0230402|NEPHROPATHIE DIABETIQUE|
CON|C0011881|GER|P|L0410535|PF|S0534817|DIABETISCHE NEPHROPATHIEN|
CON|C0011881|POR|P|L0330517|PF|S0438822|NEFROPATIAS DIABETICAS|
CON|C0011881|SPA|P|L0348126|PF|S0456431|NEFROPATIAS DIABETICAS|

Query Term: Nephropathies, Diabetic

Concept Name: Diabetic Nephropathies

UI: C0011881

Source: MSH96/MH/D003928

Source: LCH90/PT/U001367

Source: COS92/PT/U000187

Source: MSH96/PM/D003928

Source: CSP94/PT/0862-6260

Source: SNMI95/SY/DB-62110

Source: SNMI95/SY/DB-62110

Source: ICD91/IT/250.4

Source: ICD91/IT/583.81

Source: ICD91/IT/583.81

Source: ICD91/IT/583.81

Source: ICD91/IT/583.81

Vocabulary: MSH96

Definition: Includes renal arteriosclerosis, renal arteriolosclerosis, Kimmelstiel-Wilson syndrome (intercapillary glomerulosclerosis), acute and chronic pyelonephritis, and kidney papillary necrosis in individuals with diabetes mellitus.

Semantic Type: Disease or Syndrome

MetamorphoSys

- Tool zur Erzeugung von UMLS-Untermengen zur weiteren Verwendung
 - Export von Vokabularien (UMLS Lizenzierungsvereinbarung)
 - Export gesamter Vokabularien zur Modifizierung/Anpassung des Metatheaurus an die eigenen Bedürfnisse (Änderung von Benennungsprioritäten)

UMLS Semantic Network

Allgemein

- konsistente Kategorisierung aller Begriffe des Metathesaurus und Darstellung von semantischen Beziehungen zwischen diesen Kategorien

Konkret

- Bereitstellung von Informationen über:
 - set of basic semantic types or categories
 - set of relationships (between semantic types)

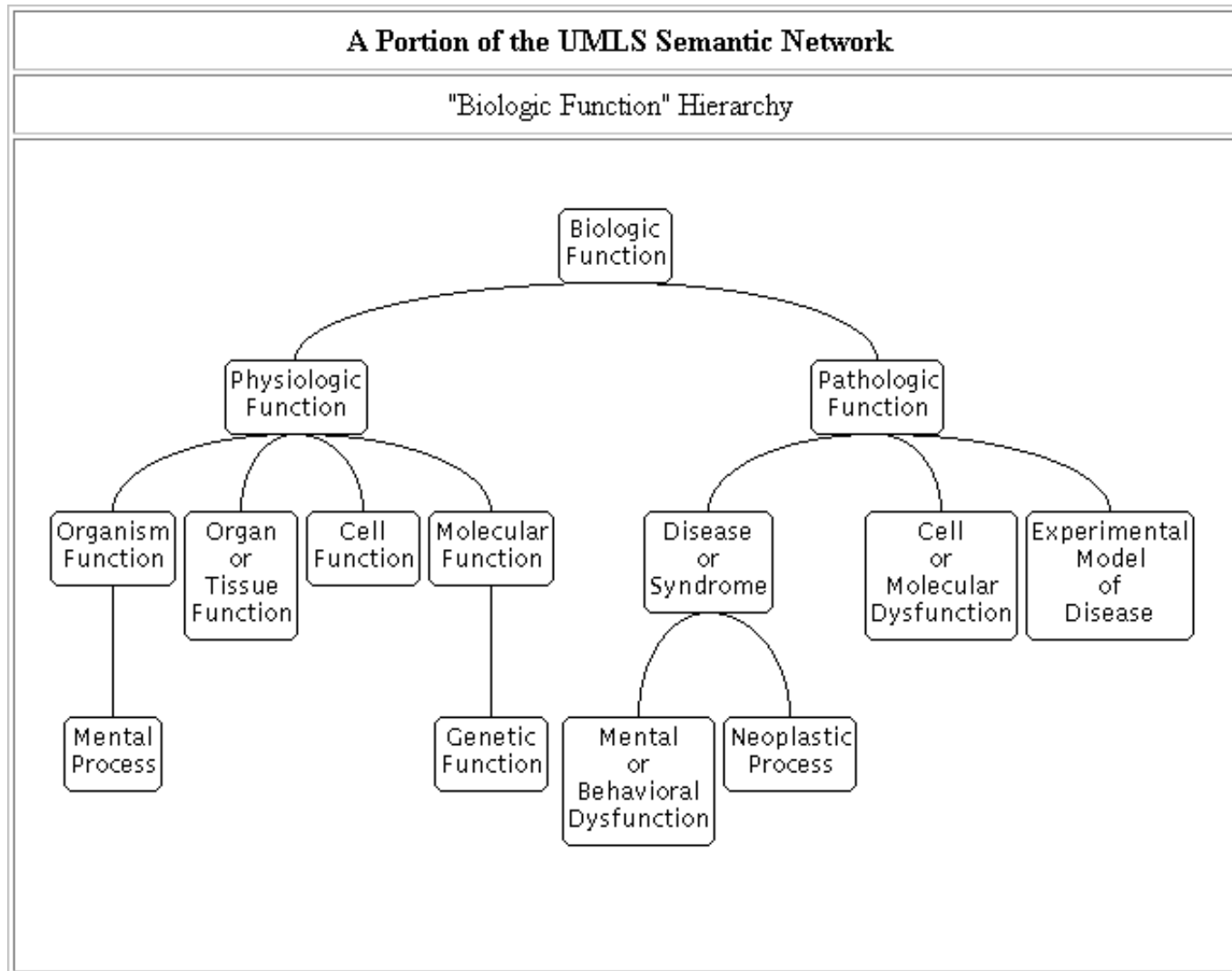
UMLS Semantic Network

- Semantic types = Knoten
- Relationships = Links

- Jedem concept ist mindestens ein semantic type zugewiesen
- Es wird immer der am meisten spezifizierte semantic type verwendet
- Der level der Granularität von semantic types variiert innerhalb des Semantic Network

UMLS Semantic Network

Ausschnitt

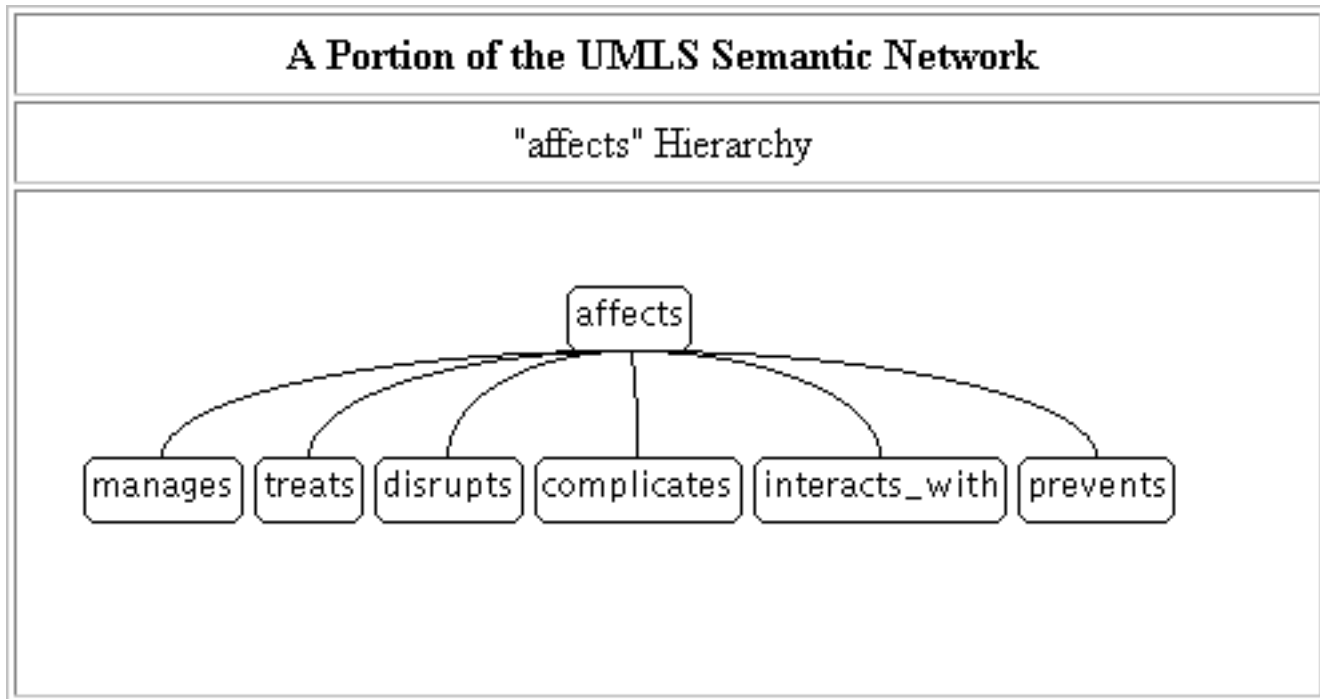


UMLS Semantic Network

- non-hierarchical relations (5 Hauptkategorien)
 - physically related to
 - spatially related to
 - temporally related to
 - functionally related to
 - conceptually related to

UMLS Semantic Network

Ausschnitt



UMLS Semantic Network

- Relationen beginnen zwischen high level semantic types und werden vererbt auf alle „children“ von diesen Typen (via is-a)

Beispiel:

Relation "**process of**" between semantic types
"**Biologic Function**" and "**Organism**"



Relation "**process of**" between semantic types "**Organ or Tissue Function**" (which is a "Physiologic Function", which is, in turn, a "Biologic Function") and "**Animal**" (which is an "Organism").

UMLS Semantic Network

- Vererbung der Relationen kann geblockt werden, wenn es notwendig ist

Beispiel:

Relation **conceptual part of** links **Body System** and **Fully Formed Anatomical Structure**

but it should not link

Body System to all the children of Fully Formed Anatomical Structure, such as **Cell** or **Tissue**

UMLS Semantic Network

- Bereitstellung in zwei Formaten:
 - relational table format (6 tables)
 - unit record format (2 records)

UMLS Semantic Network

RELATIONAL TABLE FORMAT

Table	Description
SRDEF	Basic information about the Semantic Types and Relations.
SRSTR	Structure of the Network.
SRSTRE	Fully inherited set of Relations (UI's).
SRSTRE2	Fully inherited set of Relations (names).
SRFIL	Description of each table.
SRFLD	Description of each field and the table(s) in which it is found.

UMLS Semantic Network

RELATIONAL TABLE FORMAT

Beispiel: Table SRDEF

- RT: Record Type (STY = Semantic Type or RL = Relation).
- UI: Unique Identifier of the Semantic Type or Relation.
- STY/RL: Name of the Semantic Type or Relation.
- STN/RTN: Tree Number of the Semantic Type or Relation.
- DEF: Definition of the Semantic Type or Relation.
- EX: Examples of Metathesaurus concepts with this Semantic Type (STY records only).
- UN: Usage note for Semantic Type assignment (STY records only).
- NH: The Semantic Type and its descendants allow the non-human flag (STY records only).
- ABR: Abbreviation of the Relation Name (RL records only).
- RIN: Inverse of the Relation (RL records only).

UMLS Semantic Network

RELATIONAL TABLE FORMAT

Beispiel: **Table SRDEF**

.....

SRDEF

.....

STY|T020|Acquired Abnormality|A1.2.2.2|An abnormal structure, or one that is abnormal in size or location, found in or deriving from a previously normal structure. Acquired abnormalities are distinguished from diseases even though they may result in pathological functioning (e.g., "hernias incarcerate").|Abscess of prostate; Hemorrhoids; Hernia, Femoral; Varicose Veins||||

UMLS Semantic Network

ASCII UNIT RECORD FORMAT

Semantic Type records contain the following fields:

Field	Description
UI:	Unique Identifier of the Semantic Type.
STY:	Name of the Semantic Type.
STN:	Tree Number of the Semantic Type.
DEF:	Definition of the Semantic Type.
EX:	Examples of Metathesaurus concepts with this Semantic Type (optional field).
UN:	Usage note for Semantic Type assignment (optional field).
NH:	Semantic Type and its descendants allow the non-human flag (optional field).
HL:	Hierarchical links of the Semantic Type to its parent({isa})and its children ({inverse_isa}). If there are no hierarchical links, then the value <none> is assigned.

UMLS Semantic Network

ASCII UNIT RECORD FORMAT

Relation records contain the following fields:

Field	Description
UI:	Unique Identifier of the Relation.
RL:	Name of the Relation.
ABR:	Abbreviation of the Relation.
RIN:	Name of the inverse of the Relation.
RTN:	Tree Number of the Relation.
DEF:	Definition of the Relation.
INH:	"N" if the relation is not inherited (optional field).
HL:	Hierarchical links of the Relation to its parent (<code>{isa}</code>) and its children (<code>{inverse_isa}</code>). If there are no hierarchical links, then the value <code><none></code> is assigned.
STL:	Semantic Types linked by this Relation.
STLB:	Semantic Types linked by this Relation are blocked (optional field).

UMLS Semantic Network

ASCII UNIT RECORD FORMAT

Beispiel für Semantic Type record:

.....

SU

.....

UI: T020

STY: Acquired Abnormality

STN: A1.2.2.2

DEF: An abnormal structure, or one that is abnormal in size or location, found in or deriving from a previously normal structure. Acquired abnormalities are distinguished from diseases even though they may result in pathological functioning (e.g., "hernias incarcerate").

EX: Abscess of prostate; Hemorrhoids; Hernia, Femoral; Varicose Veins

HL: {isa} Anatomical Abnormality

UMLS SPECIALIST Lexicon

- Wurde entwickelt um die lexikalischen Informationen bereitzustellen für das System **SPECIALIST Natural Language Processing (NLP)**
- Gedacht als allgemeines Englisch-Lexikon, was viele biomedizinische Begriffe beinhaltet
- Enthält zu jedem Begriff syntaktische, morphologische und graphemic Informationen

UMLS SPECIALIST Lexicon

- Besteht aus lexikalischen Einträgen
- Ein Datensatz pro Eintrag
- Ein Eintrag für jede Schreibweise
- Zusammengesetzte Begriffe /
Abkürzungen sind zugelassen

UMLS SPECIALIST Lexicon

- lexikalische Einträgen sind nicht nach ihrem Sinn unterschieden

{base=Act

spelling_variant=act

entry=E0000154

cat=noun

variants=reg

}

UMLS SPECIALIST Lexicon

LEXICON DATA ELEMENTS

- String Properties

Beispiel: AGR - Agreement/Inflection Code

Code	Person	Number
second	Second	Singular & Plural
third	Third	Singular & Plural
fst_sing	First	Singular
fst_plur	First	Plural
thr_sing	Third	Singular
thr_plur	Third	Plural

UMLS SPECIALIST Lexicon

LEXICON DATA ELEMENTS

- Weitere Eigenschaften von strings
 - CAS für case
 - GND für gender

UMLS SPECIALIST Lexicon

LEXICON DATA ELEMENTS

- Entry Properties
 - EUI – Unique Identifier Number for Lexical Entries
 - CIT – Citation Form
 - BAS – Base Form
 - SCA – Syntactic Category
 - PER – Periphrastic
 - COM – Complements
 - TYP – Inflectional Type
 - POS – Possession
 - QNT – Quantification
 - ...

Beispiel für Anwendung von UMLS

- CliniWeb International
 - An index and table of contents for clinical information on the World Wide Web
 - <http://www.ohsu.edu/clinweb/index.html>
 - Oregon Health Sciences University
 - Benutzung des UMLS zur Indexierung