HIERARCHIC STRUCTURING MEDICAL TERMS ACCORDING TO THE SEMANTIC CONTENT

Simona Nicoleta STAICU
University of Medicine and Pharmacy
"Victor Babeş", Timişoara

Abstract

Our paper focuses on the most frequent semantic relations within medical terminology, namely *hyponymy* and *meronymy*. These semantic relations are determined on the basis of a hierarchical ordering principle of terms depending on their semantic content – assigning a term that designates a specific, precise notion with another term which designates a more general notion in relation to the first, but is subsumed to the same class. Hyponymy and meronymy relations are very often encountered in specialized vocabulary because they represent a hierarchical lexical ordering of concepts. Medical terminology is a rigorously organized unit based on semantic relations in which medical terms are listed according to well defined hierarchical systems. In our analysis we have observed *monolexical* hyponyms and meronyms but also *syntagmatic constructions* contributing to highly precise definitions of certain diseases, disfunctions, symptoms. Thus, medical terms are classified according to their domains (*medicină*), subdomains (*reumatologie*), classes (*boală artrozică*) into: hyperonyms, hyponyms, co-hyponyms (*coxartroză*, *gonartroză*, *spondiloză cervicală*); meronyms (*parte - întreg*: *carp - scafoid*, *semilunar*, *piramidal*, *pisiform*)

Key words: *semantic, medical terms, hyponymy, meronymy, semantics, hierarchical systems*

Résumé

Notre étude est concentrée sur la situation des plus fréquemment rencontrés rapports qui existent à l'intérieur de la terminologie médicale, à savoir l'hyponymie et la méronymie. Ces rapports sémantiques sont établis en vertu du principe de taxonomie hiérarchique des termes médicaux en fonction de leur contenu sémantique respectif. Selon ce principe, un terme qui désigne une notion précise et bien distinguée est mis en rapport direct avec un autre terme qui, lui, désigne une notion d'un plus grand niveau de généralité que la première, mais qui pourtant appartient à la même classe que celle-là. Les rapports d'hyponymie et de méronymie sont très souvent rencontrés dans le jargon médical spécialisé, parce qu'ils représentent un ordre hiérarchique des notions naturellement fondé sur des critères lexicaux. La terminologie médicale est un système rigoureusement organisé contenant des rapports sémantiques où les termes fonctionnent de par une hiérarchie à définitions précises et strictement établie.

Mots-clés: *sémantique, terminologie médicale, hyponymie, méronymie, hiérarchique des notions*

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Hyponymy is a very common semantic relation frequently found in medical terminology. Its existence is determined on the basis of a hierarchical ordering principle of the terms according to their semantic content – assigning a term which designates a specific, precise notion – with another term that designates a more general notion in relation to the first, but is subsumed to the same class. Nevertheless, Béjoint and Thoiron (2000: 32) estimate that hyponymy is for terminology exactly what polysemy represents for general vocabulary. Hyponymy is often found in specialized language because it is a way of lexical ordering of concepts.

1. This type of semantic relation takes shape of a hierarchic structure of some lexical subunit where the hyperonym is the higher element within a class, whereas the hyponyms are the subordinate ones (Bidu-Vrănceanu, 2007: 121). This relation is the basis of lexicographic and terminographic definitions and contribute to the formulation of proximate gender and to specific differences, because it is a relationship of *inclusion* or *unilateral implication* (Bidu-Vrănceanu/ Forăscu, 2005: 92).

The notion of hyponymy is quite old and has been recently recognized as one of the 'constitutive principles in organizing the vocabulary of all languages' (Lyons, 1995: 507).

Hyponymy is equally manifested as monolexical (both the hyperonym and hyponym are lexicalized in one unit), as well as polylexical (the case when the hyperonym or hyponyms are syntagmatic lexicalizations).

Medical terminology is a rigorously organized unit based on semantic relations of hypo/ hyperonymy, in which the terms are listed in hierarchical, well defined systems.

In medical terminology we have come across plenty of examples illustrating the same situations: monolexical and polylexical hyponymy (hyperonymic collocations).

1.1. Taking into account the *simple terms* defining basic concepts, we consider the term SIMPTOM (SYMPTOM) as being a hyperonim for MANIFESTARE, STARE, TULBURARE, SEMN, INDICIU, because it can subordinate all the syntagmatic possibilities produced by its hyponyms, as well as all lexicalizations leading towards analyzed medical grading status.

The hyperonym NEVROZĂ (NEUROSIS) has been registered in specialized medical texts having the following hyponyms: ANXIETATE, DEPRESIE, ANGOASĂ, STUPOARE, SUICID, AGRESIVITATE.

In its turn, the medical word ANXIETATE (ANXIETY) can be a hyperonym for the following specialized terms: FOBIE, OBSESIE, IMPULSIVITATE, DISFUNCȚIE.

DURERE (PAIN), the commonest symptom within medical literature, is the hyperonym of the following medical terms selected from neurology: CEFALEE, MIGRENĂ, HEMICRANIE, NEVRALGIE, each of them being in turn, a hyperonym for other specific terms.

1.2. For the second case, it is recorded that the hyperonym is a simple term, whereas, the hyponyms are *complex collocations*. For the medical term SIMPTOM (SYMPTOM) we have identified in medical dictionaries 49 constructions with nouns, adjectives, but also proper names, from which we have selected the following (DM, 2007: 967-968): SIMPTOM ACCESORIU, ~ ACCIDENTAL, ~ CARDINAL, ~ CONCOMITENT, ~ CONSECUTIV, ~ CONSTITUȚIONAL, ~ ECHIVOC, ~ INDUS, ~ LOCAL, ~ DE LOCALIZARE, ~ OBIECTIV, ~ PATOGNOMONIC, ~ REFLEX, ~ SUBIECTIV, ~ ALICE ÎN ȚARA MINUNILOR, ~ PSEUDO-CUSHING, ~ REMAK, ~ VAN-GOGH, etc.

The hyperonym NEVROZĂ (NEUROSIS) has subordinated the following

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collocational hyponyms selected from the medical dictionary: NEVROZĂ DE ABANDON, ~ DE ANGOASĂ, ~ ANXIOASĂ, ~ ASTENICĂ, ~ CARDIACĂ, ~ DOBÂNDITĂ, ~ FOBICĂ, ~ DE OBOSEALĂ, ~ SPASMOFILICĂ, ~ TAHICARDICĂ, ~ VASCULARĂ, ~ VEGETATIVĂ, etc.

The term DURERE (PAIN) can attach the following hyponyms as constructions having two or three members: DURERE ABDOMINALĂ, ~ ACUTĂ, ~ CUTANATĂ, ~ DIFUZĂ, ~ GENERALIZANTĂ, ~ LOMBARĂ, ~ ÎN CENTURĂ, ~ NEVRALGICĂ, ~ PAROXISTICĂ, ~ CU/ FĂRĂ IRADIERE, ~ DE DINȚI, ~ POSTOPERATORIE, ~ PULSATILĂ, ~ REUMATISMALĂ, ~ ARTICULARĂ, ~ SIMPTOMATICĂ, etc.

There are some hyponyms subordinated to the medical term AFAZIE (APHASIA) registered as syntagmatic units by the specialized dictionary: AFAZIE AMNEZICĂ, ~ BROCA, ~ DE CONDUCȚIE, ~ FLUENTĂ, ~ MOTORIE, ~ NOMINALĂ, ~ OPTICĂ, ~ SEMANTICĂ, ~ SENZORIALĂ, ~ SINTACTICĂ, ~ TOTALĂ, ~ TRAUMATICĂ, ~ VERBALĂ, ~ VIZUALĂ, ~ WERNICKE.

SCLEROZĂ (SCLEROSIS) has expanded syntagmatic constructions with two members, such as the hyponyms: SCLEROZĂ AORTICĂ, ~ CEREBRALĂ, ~ HEPATICĂ, ~ INFLAMATORIE, ~ MIOCARDICĂ, ~ PROLIFERATIVĂ, ~ TUBEROASĂ, ~ ALZHEIMER. Having the same hyperonym, the specialized dictionaries highlighted collocations with three members or prepositions: SCLEROZĂ CORTICALĂ DIFUZĂ, ~ PULMONARĂ DIFUZĂ, ~ SISTEMICĂ PROGRESIVĂ; SCLEROZĂ ÎN PLĂCI, ~ DE PENETRAȚIE, ~ DE ÎNCERCUIRE.

But not only is anatomy a rich source of hyperonyms and hyponyms. We have come across, within physical therapy and reumathology, many hyponyms of the medical term MIȘCARE (MOTION), subordinating classes of specific motion nouns correlated to each anatomic organ (hand, fingers, leg, spine, hip, shoulder etc.), or to a single segment of an organ (thumb, forehand, elbow, thigh, etc.). For example, hyponyms of the term MIȘCARE, used in physical therapy, related to motion such as, ADDUCȚIE, ABDUCȚIE, CIRCUMDUCȚIE, EXTENSIE, FLEXIE, PREHENSIUNE, PRONAȚIE, SUPINAȚIE, ROTAȚIE, AMPLITUDINE, etc.

It should be mentioned that the hyponymic semantic relations can be established not only within noun terms, but also within verbs.

The factitive verbs that define the action of A INTRODUCE (TO INTRODUCE) in medical terminology are hyponyms subclassed to this specific hyperonym. During our analysis we have distinguished the following: A IMPLANTA, A INFECTA, A INFESTA, A INGERA, A INJECTA, A INOCULA, A INSEMINA, A INSERA, A INUNDA, A INTUBA, A INVAGINA, A INFILTRA.

But a hyperonym might have in many cases more hyponyms, which, in turn, can be located graphically in the horizontal plane, gaining a status of co-hyponyms.

For example, HEPATITĂ, GASTRITĂ, ULCER, DIABET are subordinated to the generic term BOALĂ, which is, in fact, a hyperonym. Each of the diseases listed above may be hyperonyms and hyponyms for other medical terminological units.

The term HEPATITĂ is registered in the Medical Dictionary (MD, 2007: 548-549) having 24 hyponyms: HEPATITĂ A, ~ ALCOOLICĂ, ~ AUTOIMUNĂ, ~ B, ~ C, ~ CIROGENĂ, ~ COLESTATICĂ, ~ COLOSTATICĂ, ~ CRONICĂ, ~ CRONICĂ ACTIVĂ, ~ CRONICĂ AGRESIVĂ, ~ CRONICĂ NEAGRESIVĂ, ~ CRONICĂ PERSISTENTĂ, ~ D, ~ E, ~ EPIDEMICĂ, ~ FULMINANTĂ, ~ F, ~ G, ~ LUPOIDĂ, ~ MEDICAMENTOASĂ, ~ NON A - NON B, ~ SERICĂ, ~ VIRALĂ.

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For medical terminology the two-layer marks are those that differentiate the terms in relation to the specialties they belong to and direct the definition to the specific field, such as: (med.), (anat.), (histo.), etc. Starting from the general hyperonym, MEDICINĂ, we try to list the hyponyms within a medical field, according to a vertical hierarchical scale. Thus, the domain MEDICINĂ subclasses, on an inferior level, the sub-domain REUMATOLOGIE, which is, in fact, the hyponym of the domain, but, at the same time, it can be considered the hyperonym for BOALĂ REUMATISMALĂ, defining the class or the generic term.

The medical collocation BOALĂ REUMATISMALĂ is the hyponym in relation to the term REUMATOLOGIE, but it can be a hyperonym for the following syntagmatic items BOALĂ ARTROZICĂ, POLIARTRITĂ REUMATOIDĂ, PERIARTRITĂ SCAPULOHUMERALĂ etc., the last constructions being considered specific terms of the class, but also co-hyponyms for BOALĂ REUMATISMALĂ. If we select from the hierarchical scale the specific term BOALĂ ARTROZICĂ we may identify other hyponyms in relation to this hyperonym, as in: COXARTROZĂ (PRIMITIVĂ, SECUNDARĂ), GONARTROZĂ (PRIMITIVĂ, SECUNDARĂ), SPONDILOZĂ (CERVICALĂ, DORSALĂ, LOMBARĂ), etc., denoted as co-hyponyms for this collocation (BOALĂ ARTROZICĂ).

These co-hyponyms are subordinated vertically to one and the same hyperonym, having within their semantic structure all the semantic components of that specific hyperonym, and one or more additional components, but on a horizontal scale, differentiating between them through distinctive semantic components. The *hyper-* and hyponymic semantic relations are very frequently used within medical terminology.

2. Another type of lexical-semantic relation, specific to terminological units is represented by **meronymy**, based on a closer or associated approach in space of the denotations (L'Homme 2004: 98). One term designates the UNIT and the other or others designate the PARTS. There are several types of such relations. The meronymy relations imply the existence of a *holonym*, which designates the UNIT, and one or more *meronyms* defining the PART or PARTS.

The holonym CARP, as an anatomic part of phalanges, in the first place or proximal gender, presents from the thumb to the little finger, four bones, all these being meronyms: SCAFOID, SEMILUNAR, PIRAMIDAL, PISIFORM; in the second place or distal one, following the same order, other four bones, namely the meronyms: TRAPEZ, TRAPEZOID, CAPITAT and OSUL CU CÂRLIG.

For the bone of the foot, TARS, we can identify the meronyms: TALUS, CALCANEU, NAVICULAR, CUBOID and three CUNEIFORME bones.

Medical anatomy texts offer such examples of holonyms and meronyms, both classes being syntagmatic constructions (having two or three members): ARTICULAȚIA MÂINII contains the following meronyms, ARTICULȚIA RADIO-CARPIANĂ, ARTICULAȚIILE CARPULUI, ARTICULAȚIILE CARPO-METACARPIENE, ARTICULAȚIILE INTERMETACARPIENE.

For example, the first term is the holonym within the semantic relation *disease – influenza*, and the second represents the meronim. If we graphically picture this relation, we may identify that the meronym is vertically subordinated to the holonym. For instance, *auricle* (meronym = part of the anatomical organ) – *heart* (holonym = representing the entire organ). This sort of semantic relations are frequently found in medical terminology, especially "multiple meronymy", taking into account many

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levels. The *human body* encounters **co-meronyms** such as *heart – auricle – ventricle*.

The hierarchical structure of medical terms defining parts of the human body is extremely important.

Meronymy, as well as any other taxonomic ordering, may have different levels. For example:

Level I

PĂRȚI ALE CORPULUI UMAN – *holonym*

Level II

CAPUL – *meronym* in relation to the first term (PĂRȚI ALE CORPULUI), *co-holonym* in relation to other parts of the human body (GÂT, MEMBRE, TRUNCHI), and *holonym* for the terms exemplified at level III.

Level III

CAP → CRANIU, CREIER, FRUNTE, TÂMPLĂ, PĂR, OCHI, FAȚĂ, OBRAZ, URECHE, NAS, GURĂ, MAXILAR, BĂRBIE.

We can distinguish other subordinate levels:

Level IV

GURA → PALAT, LIMBĂ, BUZĂ, DINTE, GINGIE

Level V

DINTE → INCISIV, CANIN, PREMOLAR, MOLAR.

If for the 6th level we may choose the term OCHI, the following meronyms may appear: GLOB OCULAR, CORNEE, SCLEROTICĂ, CRISTALIN, RETINĂ, NERV OCULO-MOTOR; GEANĂ, SPRÂNCEANĂ, PLEOAPĂ.

We will exemplify other types of meronymy relations within medical terminology:

ÎNTREG (UNIT) → PARTE (PART): coloană vertebrală → regiune cervicală – regiune toracală – regiune lombară – regiune sacrală – regiune coccigiană;

ANSAMBLU (TOTALITY) → ELEMENT (ELEMENT): scheletul corpului uman → scheletul capului – scheletul trunchiului – scheletul membrelor;

TOTALITATE (TOTALITY) → ELEMENT (ELEMENT): inima → pericard – miocard – endocard;

OBIECT/ ORGAN (OBJECT/ ORGAN) → CONSTITUENT/ MATERIAL (PART/ MATERIAL): sânge → globule albe – globule roşii – plasmă; celulă → membrană – citoplasmă – nucleu;

ACTIVITATE/ PROCES (ACTIVITY/ PROCESS) → FAZĂ (PHASE): proces de alimentație → ingerare – masticație – deglutiție – digerare – absorbție – resorbție – eliminare; proces de respirație → inspirație – expirație;

ZONĂ (AREA) → LOC (PLACE/ LOCATION): cavitate toracică → plămâni – inimă; cavitate abdominală → stomac – ficat – pancreas – splină – fiere – intestine.

Conclusions

Examining the connections established between hyponymy and meronymy within the medical language, we have noticed that the typological characterizing pattern of entourage in a specialized context, is defining for the precise description of lexemes in a certain medical context.

With our approach, we have tried to prove the systematic nature of medical vocabulary interrelations, special approaches in which the constituent terms of this terminological unit update their meanings, both at the level of the Romanian vocabulary, considered as a well-defined, constantly innovated system, and at the

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dynamic level of syntagmatic relations between the component elements of this lexical unit, where specific contexts of medical terms are strongly outlined.

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