THE MANAGEMENT OF DENOTATIVE METAPHORS IN ENGLISH MEDICAL NOMENCLATURE

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Abstract: *This paper focuses on denotative metaphors, lexical units permeating both the scientific, economic and medical nomenclatures. Starting from a critical reflection on the generalizing discussion of medical coinages that ultimately reaches eponyms, we relate metaphorization to catachresis, a phenomenon whose means account for vocabulary enrichment. An approach to the linguistic patterns working as denotative metaphor is advanced. This corpus-based analysis of denotative metaphors in English medical nomenclature of diseases and other disorders proposes a taxonomy of this group of appellatives, aiming to present them as lexical units that are easier to understand, use and manage. Structural, etymological and qualitative analyses bring the most salient linguistic features of denotative metaphors to the foreground. Our theoretical specifications and practical illustrations will prove useful not only to teachers and medical students, but also to (young) medical translators and translation studies analysts.*

Keywords: *conceptualization; metaphorization; lexicalization; nomenclature; teaching.*

Preliminary lines

The Management of Denotative Metaphors in English Medical Nomenclature is a title that brings together issues regarding the management of terminology, foreign language learning, and lexical semantics. Both "management", "nomenclature" and "metaphor" are words that have gradually acquired new meanings over the centuries. Thus, "management" meant "the act of managing and manipulation" in 1590s, "the act of managing by physical manipulation" in the 1670s, and today it refers to the personal "act, manner, or practice of managing; handling, supervision, or control" (Onions 550). "Nomenclature" is a system of names used in an art or science. In medicine,

> "there are three major types of nomenclature of disease, which may be termed *clinical*, *epidemiologic*, and *investigative*. The first is used by the physician to record clinical and pathological data on patients. The second, usually less detailed, is used primarily by health statisticians for broad analyses of administrative, epidemiologic, or vital statistical data and by health registrars for recording causes of death and morbidity. The third is the highly specialized and usually evolving nomenclature of the biomedical investigator working in a limited field of research" (Kennedy, Kossman 238).

Although numerous definitions have been proposed to this date, most stylisticians and language analysts consider that "metaphor is principally a way of conceiving one thing in terms of another and its primary function is understanding" (Lakoff, Johnson 36). As "most of our everyday language is metaphorical" (Salager-Meyer 146), metaphor has been a subject of inquiry in fields such as humanities, social sciences, psychology, economics, nature sciences, anthropology, communication, and medicine. In addition to their literary and stylistic values, metaphors occur in medical contexts that explore both "peer-to-peer or expert-to-expert communication" (Di Bari, Gouthier, 1), who prefer the scientific vocabulary and doctor-nurse, nurse-nurse, doctor-patient or family members communication, who use popular scientific style. Popular scientific communication "aims […] to explain and highlight all the essential logical connections for a readership whose background is very different" (Di Bari, Gouthier 2). Linguistic approaches to medical metaphors have most often explored metaphors in communication rather than in terminology.

Our English language-based research focuses on the metaphors that have enriched the nomenclature of diseases and disorders. Like any other professional language, medical English is a vivid organism that has continually evolved, improved and expanded its vocabulary, making profitable use of a wide variety of lexical units. These units originate in the word stock, which contains both common words and tropes such as metaphors, analogies, similes, "metonymies, and synecdoches, in all their synchronic manifestations" (Nunberg 109). Plenty of these tropes can undergo transformations, shifting from stylistic devices with emotional functions to common words with appellative or denotative purposes. The metamorphosis of tropes into one- or multi-word lexical units with a well-determined meaning may be either a failure or a success: while some tropes become entries in various dictionaries, attaining the status of denotative metaphors, others gradually fade from use. The former category represents the outcome of the lengthy process of lexicalization.

This paper briefly reviews the etymology, definitions, roles and classifications of metaphors interpreted from the perspective of the English medical nomenclature. It also approaches the transformation of simple words into denotative metaphors distinguishing between conceptual and denotative medical metaphors. Next, it dwells on the metaphoric names of diseases, syndromes and other disorders, which can hinder the efficient teaching-learning process that involves both teachers of English, who may not be medically trained or conversant with medical terminology, and beginner learners. Medical students - who must face numerous social, personal and academic challenges, in addition to a constant need to adapt to and integrate into the medical environment in which they study and work - will also find

several helpful suggestions for efficiently and efficaciously managing their terminological knowledge.

On metaphors and their definitions

The word "metaphor" originates in "the Greek *meta-*, 'beyond' and *phora*, which is derived from *pherein*, 'to carry'" (Taverniers 17), and it is now used to refer to a transfer of "meaning from one reality to another" (Invarovna 2).

A simple definition describes "metaphor as figurative language in which one concept is described as being equivalent to another, often imbuing the first with qualities that are difficult to describe in other ways" (Casarett et al. 257).

As a means of communication, a metaphor has a few characteristics of usage that make it unique among other forms of catachresis. Due to its practical nature, the metaphor has become indispensable in everyday action, thought, and language, serving as a means "to comprehend experiences, events and activities" (ten Have, Gordijn 577). At the same time, the "metaphor is the dreamwork of a language and, like all dreamwork, its interpretation reflects as much on the interpreter as on the originator" (Davidson 31). Thus, metaphors can be used manipulatively or strategically as mind-set changers by communicatively skilled doctors, who most often do their best to create environments that are not necessarily true to life but serve certain "policies of containment, controllability and surveillance" (ten Have, Gordijn 577). Less harmfully, a metaphor may be used for denotative purposes when comparison- and/or analogy-based observations inspire the naming of medical conditions or names for health disorders. In other words, "physicians and patients may use metaphors and analogies to enhance their ability to communicate effectively" (Casarett et al. 255), as they "are helpful tools for the transmission of scientific knowledge in a more popular way" (Tambor 166), when "two things are compared as one is said to be similar to, though it is different from, another" (Aubusson et al 4).

The (re)endowment of old words with new significations has often been viewed as a semantic change / transfer (Anderson 234), and as an outcome of catachresis (Oliveira 95, Jamet, Terry 32). The notion of "catachresis" has created a few controversies that started with its definitions. The word "catachresis" was described to refer to "the improper use of words; application of a term to a thing which it does not properly denote, abuse or perversion of a trope or metaphor" (OED 965). Black criticised the pejorative definition provided by OED, as he viewed catachresis as "a striking case of transformation of meaning that is constantly occurring in any living language" (Black 279-280). This updating of word sense(s) simply represents "the putting of new senses in old words" (Black 33). Of course, assigning new senses to old words involves introducing a new concept that needs a name and

a relationship between the two, such as one of comparison or analogy. In such instances, language coiners have always operated with two concepts, i.e., the A or the starting point (e.g., proper names or any common words), more familiar in literature as the source domain, and their pre-established B or terminal point (most often, new discoveries and inventions that need a name), or the target domain. In the context of our research, the target domain consists of the names of diseases and disorders, while the source domain will be described below. The vectorially interpreted lexical transfer from the source to the target domains - or from points A to B - involves the migration from:

(a) proper noun to proper noun, e.g. *Bolivia* (a country named in honour of its national hero, captain Simon Bolivar), *San Francisco* (a city in California, named in Spanish after St. Francis of Assisi), Octav Pancu-*Iasi*[1] (an author who added the name of his birth town to his family name), C. D. *Zeletin*[2] (the creek-inspired pseudonym of a reputed medical doctor; he used it to sign his literary creations and translations)

(b) proper noun to common noun, e.g., to *pasteurize* (from Jean Louis Pasteur), *newton* (from Sir Isaac Newton's family name), *tularaemia* (< a disease first discovered in *Tulare* County, California)

(c) common noun to proper noun, e.g., *guardian* and *sun* became *The Guardian* and *The Sun,* well-known UK newspapers; the adjective *independent* changed into the proper noun *The Independent*

(d) common noun to common noun, distinguishing two main types of catachresis, i.e., metaphor (e.g., *the foot of the hill*, *the eye of a needle*) and metonymy (*the bottle* for *drink*, *petticoat* – derogatorily used for *woman*)

According to Black's (1962) definition, the (d)-type of catachresis is represented by metaphor and metonymy, both of which are based on analogy or comparison. Through these processes, the meanings of familiar words are enriched, and new appellatives are coined. Although metaphors have rarely been related to catachresis, Max Black (33) made this connection, when he stated that a "… metaphor is a species of catachresis which accounts for the use of a word in some new sense in order to remedy a gap in the vocabulary".

On the lexicalization of metaphors

Metaphors stylistically used in medical communication are context-dependent and reflect the impact of the cultural, social and ideological trends. Denotatively used to name different concepts and/or entities, they reflect a semantic metamorphosis that results from a process of metaphorization, defined as "conceptualizing one thing in terms of another, i.e. in terms of similarity, e.g. the use of Latin *ad* 'to' + *mit* 'send' for locution (*admit*) or of *tissue* 'woven cloth' for 'aggregation of cells in animals or plants'" (Traugott 3).

After a metaphor has undergone a semantic change and has been accepted as a lexical unit, the lexicalization process or the second stage in its transformation is over. These new lexical units or lexicalized metaphors have often been the target of pejoration, as numerous linguists referred to them in less felicitous syntagms. Thus, metaphor analysts working with "many familiar metaphors about familiar metaphors" (Blank 21), named them "dead metaphors" (Alm-Arvius 7), and "lexicalized metaphors" (Blank 21). "Dead metaphors" are just stylistically "dead"; terminologically, they are alive and fully functional, being used in present-day written or spoken communication. After all, "a change in the meaning of a speech form is merely the result of a change in the use of it and other semantically related speech forms" (Bloomfield 426).

At the beginning of the 2020s, any word association playing the role of metaphor was "used in the process of creating a dictionary" (Tambor 153), thus revealing their availability for lexicalization. The notion of "lexicalization" was conceptualized in 1992 as "the process by which complex lexemes tend to become a single unit, with a specific content, through frequent use" (Lipka 5). Broadly, lexicalization means "the adoption of words into the lexicon […], as a routine process of word formation […] and as the development of concrete meanings" (Brinton and Traugott 1).

Metaphors in the medical language are based on the cause-effect relationship, and they come into being in situations accounted for by two principles. The former, "first the problem and then the metaphor," applies when a problem needs a solution. The latter, "first the metaphor and then the problem", applies when metaphorical analogy leads to the perception and detection of a problematic situation (Tambor 166). The first principle best accounts for lexicalized metaphors, while the second is applicable to CMs.

Metaphors in medical language. Roles and typologies

As both tropes and lexical units, metaphors are "used in a variety of ways in the language of medicine" (Aubusson et al. 4), functioning as both tools of communication and means of denotation. As tools of communication, metaphors are tropes reshaping the reality to serve a certain purpose in a conversation. They frequently occur in doctor-patient communication, being used by "doctors and nurses […] to convey a diagnosis, describe a treatment, or explain the function of an organ to their patients" (Hanne 36). Doctors tailor their metaphoric approach, i.e., their conceptual metaphors (CMs) to create a certain effect on patients. CMs relate to (a) *fight and war,* where the soldier or patient must "fight to the end", (b) to *sports,* as they can encourage the patient "to play until the end" and (c) *machines*, as the human body is viewed "as a machine with faulty parts that can be removed and replaced" (Periyakoil 843). Patients' metaphors help them depict their personal contact with the illness

and confess that "a dark cloud hangs over me," "the nausea comes in waves," "it feels as if there is an elephant sitting on my chest" (Hanne 36). Helpful to health care professionals, patients and their families, metaphors not only transfer meanings clearly and economically, but they also facilitate a certain degree of "safety through ambiguity" (Periyakoil 843). The use of CMs has also flourished in the health-focused political discourse and health policy discourse. CMs bloomed during the SARS-Co-V-2 pandemic, when "policymakers initiated a 'war' against the virus, like they previously declared wars on cancer and drugs" (ten Have, Gordijn 577). CMs in medical language are versatile and hence, applicable in plenty of ease "fights". Due to their generalizing nature, CMs are used in conversations between healthcare professionals and patients suffering from different diseases. When they are created on the spot, they may be short-lived. When they have undergone metaphorization, they will live a long life enriching the medical vocabulary.

The latter category of medical metaphors is that of terminological, lexicalized, scientific or denotative metaphors. Literature discusses both "lexical" and "lexicalized" metaphors either making no distinction between the two or contrasting "lexical" to "grammatical" metaphors. The determiner "denotative", derived from the verb "to denote" is linguistically used as a synonym for the verb "to name"; due to its linguistic nature, we consider it the best match for the metaphors assimilated by nomenclatures.

Denotative metaphors have a binomial structure, as they must often "involve an implicit a comparison between A and B" (Salager-Meyer 147). The Salager-Meyer Interpretive Model (SMIM henceforward) linguistically analyses the structure and nominal character of medical metaphors, and concluded that they (1) predominantly belong to the nominal group, and scarcely to adjectival and verbal groups; (2) are of the "compound-word" type (with structures that show formulaic representations such as N+N and N+N+N and adjective+N+N+N, a case where modifying adjectives belong to the medical field), and (3) colour is rarely used in their structure. The Salager-Meyer analysis of anatomical terminology distinguished the following five source domain subgroups: architectural (e.g., *abdominal wall*, *aortic arch*), geomorphical (e.g., *visual field*, *stellar angioma*), phytomorphical (e.g., *coronary tree*, *nerve roots*), zoomorphical (e.g., *bull's eye lesion*, *buffalo hump*) and anatomical (e.g., *femoral neck*, *vertebral bodies*).

Denotative metaphors, such as *Axis*, *Atlas* (Grey 6) and *sella Turcica* (Grey 32), were used in the mid-nineteenth century English books of anatomy, so metaphorization has a long history. Over the last hundred years, other 450 metaphoric denominations related to "fruit, vegetables, cereals, seafood, dairy products, fauna, flora, astronomical bodies, weapons, dining table utensils, laboratory equipment, drink and colours" (Masukume, Zumla 55) have been

added to the medical terminology. Our research analysed the denotative metaphors in the medical nomenclature of diseases and other disorders.

Metaphors in English medical nomenclature

Medical English is one of the most complex professional languages, which comprises a rich heritage of Anglo-Saxon words, adoptions and/or adaptations mainly from Greek, Latin, French, as well as neologisms. These neologisms refer to nineteenth- and twentieth-century lexical creations rooted in common words, personal and geographical names. The common words of the English stock, which initially had a literal meaning, were transferred into the medical vocabulary as denotative metaphors. English metaphors may have either one or several readings reinforcing the "fact that many words exist at the same time with distinct but related senses" (Anderson 234). Thus, for example, *seagull murmur* and *swimmer's ear* can be used with both their literal (i.e. as non-clinical terms, e.g. 1a and 2a) and figurative meanings (i.e. as clinical terms, e.g. 1b and 2b):

1a. The silence was so overwhelming that you could hear the *seagull murmur*.
1b. The *seagull murmur* is a heart disorder.
2a. The *swimmer's ear* was swollen.
2b. The *swimmer's ear* is an ear disorder.

Denotative medical metaphors have been approached discretely, exploring, for example, culinary terms (Terry, Hanchard 1636-9), food (Kluger 147-152), fruit and gustatory aromas (Milam et al. 912). Other medical language explorers have discussed medical appellatives that are related to the language of agriculture, mechanics, military and sports (Casarett et al. 257). Approaches to one- and multi-word lexical units, which consist of personal names (PNs) and common nouns (CNs) in well-established constructions known as eponyms or eponymisms, have most often subsumed toponymic, metonymic and metaphoric denominations to eponymisms (Seto, Zayat 131-140).

Terminology management

Recent literature envisages several facets of terminology and defines more frequently used terms, such as "terminology work", "terminology tool", "terminology science" or "terminology studies", "terminology resources", "terminography", "terminology management" and "terminological data" (Kudashev 75). The formations "terminology work" and "terminology management" are interchangeable synonyms which refer to "work concerned with the systematic collection, description, processing and presentation of *concepts* and their *designations*" (Kudashev 77). Irrespective of its name,

working with (new) concepts and designations is a difficult task which, in the final analysis, may have or may have not benefitted from an individual's managerial abilities.

Research design and methods

The acquisition and management of medical terminology are crucial to beginner medical students, academics teaching English for Medical Purposes (EMP, from now on), translation trainers, would-be and professional translators. Denotative medical metaphors may be deceiving in the translation process, but this paper provides details related to their accurate meaning. The relevant data for the current analysis were collected from three different but very popular medical dictionaries, i.e., Stedman's *Practical Medical Dictionary* (6th ed.), *Taber's Cyclopedic Medical Dictionary* (23rd ed.), and *Dorland's Illustrated Medical Dictionary* (33rd ed.).

The choice of each dictionary had it reason. Starting from the principle of chronology, we first examined the dictionaries for gist and discovered that there were numerous denotative medical metaphors to analyse. We also applied the principle of validity, according to which an entry had to be included in at least two of the sources. The confirmation of this principle came as we were collecting the terms and noticed that the metaphors in use at the beginning of the 20th century could not be identified in the 21st century editions. This was because the concept they were related to had already become irrelevant. For example, *auctioneer's cramp* (Stedman 96), *balloon sickness*, (Stedman 101), *seamstress's cramp* (Stedman 233) and *telegraphist's cramp* (idem) do not exist in the other two dictionaries. The metaphors were collected manually and organized into a corpus consisting of 320 examples, which we agreed that sufficed to make generalisations and highlight their most salient linguistic features.

Findings and discussion

Our taxonomy of denotative medical metaphors relies on their structure, grammatical nature, semantic value and lexico-semantic relationships. Structurally, they will be described in terms of the elements underlying the comparison that favoured their genesis, but which are now viewed as components of a noun group (NG), i.e., the DETERMINER (D) and the HEAD (H). In accordance with the grammatical nature of the metaphor components, either simple or compound common nouns are predominant, adjectives are rather scarce, and verbs do not exist. The semantic criterion of denotative medical metaphors was included in this classification to align our research with existing literature. Synonymy, as the case stands with other medical nomenclatures, is prevalent among denotative metaphors. Several two- and three-word structures were differentiated.

A structural classification

Our findings include one-word, two/three-word and multi-word lexical units that stand for denominations of medical disorders. *Fauvism*, *lockjaw*, and *shingles* belong to the least represented set of one-word metaphors. Contrary to this pattern, the richest group consists of noun + noun compounds (e.g., *bayonet-leg, flint disease* and *monkey hands*).

The formulaic representations of denotative medical metaphors encapsulate distinctions of both structure and grammatical nature. These metaphors most often encompass elements of the following lexical classes: adjective [Adj], noun [N], verb [V] and the attributively used present participle [PP] or past participle [PtP]. Our taxonomy advances the following structures:

1) two-word units:
   a) [N] + [N], e.g., *catheter fever*, *bow leg*, *beer heart*, *famine fever*
   b) [Adj] + [N], e.g., *brassy cough*, *brawny arm*, *funicular hernia, silent ischemia*
   c) [PP] + [N], e.g., *burning mouth syndrome*, *bursting fever*, *dancing disease, falling sickness, relapsing fever*
   d) [PtP] + [N], e.g., *burrowed tongue*, *frozen shoulder*
2) three-word units:
   a) [N] + [N] + [N], e.g., *bowler hat sign*, *cat-eye syndrome*, *leather bottle stomach, economy class syndrome*
   b) [N] + and + [N], e.g., *pins-and-needles*
   c) [V] + [V] + [N], e.g., *see-saw murmur*
   d) [PP] + [N] + [N], e.g., *disappearing bone disease, swimming pool granuloma*
   e) [PtP] + [N] + [N], e.g., *broken straw sign*
   f) [Adj] + [N] + [N], e.g., *brittle bone disease, blue nose disease, crazy chick disease*
   g) [Adj] + [Adj] + [N], e.g., *black hairy tongue*
   h) [N] + [Adj] + [N], e.g., *clergyman's sore throat*
3) multi-word units:
   a) [N] + and + [N], e.g., *foot and mouth disease*, *finger-and-toe disease*
   b) [V] [+ and] + [V] + [N], e.g., *fall-and-rise phenomenon*
   c) [compound N] + [N], e.g., *café au lait spots*
   d) [Adj] + [N] + [N] + [N] + [N], e.g., *blue rubber bleb nevus syndrome*

A semantic taxonomy of denotative medical metaphors

The semantic perspective focuses on the meaning of both the DETERMINER (D henceforward) and HEAD (H) of the denotative medical metaphoric NGs. In most cases, the determiner is a noun in the genitive, but often this implicit genitive co-occurs with the other variant.

A D-based taxonomy comprises the following types of metaphors:

(1) job-related metaphors based on:
  a) simple nouns in the singular:
    i) which preserve the genitival form, e.g., *baker's leg*, *baker's itch*, *barber's itch*, *bricklayer's cramp*, *brickmaker's anemia*, *chauffeur's fracture*, *clergyman's knee*, *grocer's itch*, *housemaid's knee, mason's lung*, *mechanic's hand*, *obstetrician's hand*, *preacher's hand*, *reaper's keratitis*, *soldier's heart*, *soldier's patch*, *tailor's ankle*, *tailor's bunion*, *violinist's cramp*, *weaver's bottom*, *welder's eye*, *woolsorter's disease*
    ii) which show a determiner-determinatum relationship, e.g., *caretaker* gene, *gatekeeper* gene, *swineherd* disease, *clover* disease
  b) nouns in the plural: e.g., *athletes'* sickness, *aviators'* disease, *bauxite workers* disease
  c) compound nouns:
    i) in the singular, e.g., *apple sorter's* disease, *glass blower's* mouth, *grain handler's* lung, *grenade-thrower's* fracture, *barometer-maker's* disease, *brass founder's* ague, *ballet-dancer's* cramp, *pearl worker's* disease, *vineyard sprayer's* lung, *chimney-sweep's* cancer, *cork-handler's* disease, *silo-filler's* disease, *swineherd* disease, *bird-breeder's* lung, *cheese-handler's* disease, *rose-handler's* disease, *malt worker's* lung, *meat wrapper's* lung, *clam digger's* itch, *clay-shoveler's* fracture
    ii) in the plural, e.g., *coal workers'* pneumoconiosis, *file-cutters'* disease, *flex-dressers* disease, *rose-handler's* disease

(2) sports-related metaphors:
  a) sportspersons-based denominations: *high-jumper's strain*, *golfer's elbow*, *surfer's ear*, *sprinter's fracture*, *athlete's foot*, *athlete's heart*, *surfer's ear*, *surfer's knob / knots*, *golfer's cramp*, *boxer's ear*, *boxer's fracture*, *swimmer's ear*, *swimmer's itch*, *jumper's knee*, *diver's paralysis*
  b) sports-related denominations, e.g., *ping-pong* fracture, *basketball* heel, *tennis* leg, *rugby* knee, *cricket* thigh

(3) anatomy-vocabulary-based metaphors:
  a) preserving the genitival forms: *purpura of the legs*
  b) which are based on the determiner-determinatum relationship: *brain fever*, *brittle bone disease*, *disappearing bone disease*, *foot-and-mouth disease*, *frozen shoulder*

(4) culinary metaphors
  a) fruit, vegetables, and food-related metaphors: *blueberry muffin baby*, *cake kidney*, *caked breast*, *doughnut kidney*, *cauliflower ear*, *date-*

fever, *food* disease, *milk* leg, *hot cross bun* head, *pancake* kidney, *famine* fever, *strawberry* gallbladder, *strawberry* nevus, *strawberry* tongue, *waterfall* stomach, *watermelon* stomach, *cherry* angioma, *bran* disease, *apple core* lesions, *apple jelly* nodules

b) drink metaphors: *punch drunk* syndrome, *beer* heart, *cow's milk* anaemia, *goat's milk* anaemia

(5) animal-, bird- and insect-related metaphors, e.g., *buffalo* hump, *dromedary* hump, *monkey* paw, *claw*-foot, *claw*-hand, *claw*-tow, *rabbit* syndrome, *racoon* sign, *fish-eye* disease, *fishskin* disease, *pigeon* toes, *tapir* mouth, *seagull* murmur, *spider* angioma, *spider* nevus, *swan neck* deformity

(6) colour metaphors:

a) blue: *blue asphyxia*, *blue blindness*, *blue* (*rubber bleb*) *nevus*, *blue phlebitis*

b) black: *black disease*, *black eye*, *blackleg*, *black fever*, *black hairy tongue*, and *black light*

c) pink: *pink disease*, *pink-eye*

d) red: *red infarct*, *red neuralgia* and *red reflex*, *cherry red spot*

e) white: *white infarct*, *white lung*, *white mouth*

(7) clothing and accessory-based metaphors, e.g., *helmet* headache, *sabot* heart, *sleeve* graft, *sleeve* gastrectomy

(8) vehicle-related metaphors, e.g., *balloon* sickness, *carsickness*

(9) substance-related metaphors, e.g., *iron*-lung, *putty* kidney, *sponge* kidney, *stone* disease

(10) place or geography-related metaphors, e.g., *swimming pool* granuloma, *island* graft, *shipyard* eye, *trench* hand, *trench* mouth, *waterfall* stomach, *weathering* nodules

(11) disease-based metaphors, consisting of

(a) two common nouns, e.g., *cough headache*, *harlequin ichthyosis, trench hand*

(b) an adjective followed by a noun, e.g., *hysterical breast*, *hysterical neurosis*, *influenzalike illness*, *anaemic infarct*, *pale infarct*

(12) common noun-based metaphors, e.g., *devil* (*devil's* grip), *dowager* (*dowager's* hump), *hook* (*hook* grip), *horseshoe* (*horseshoe* kidney), *hourglass* (*hourglass* murmur)

Compared to the DETERMINER-based taxonomy, the HEAD-based taxonomy comprises fewer types of metaphors. The head is expressed by nouns either in the singular or plural belonging to:

1) anatomical terminology: *ankle* (tailor's *ankle*), *foot* (bear's *foot*, foxhole *foot*), *hand* (club *hand*) and *hands* (mechanic's *hands*, monkey *hands*, mirror *hands*), *head* (hourglass *head*, saddle *head*),

heart (water-bottle *heart*, chaotic *heart*, boat-shaped *heart*), heel (basketball *heel*), *kidney* (doughnut *kidney*, cake *kidney*, horseshoe *kidney*, pancake *kidney*, putty *kidney*, sponge *kidney*), *leg* (bow *leg*, bandy-*leg*), *lung* (honeycomb *lung,* iron *lung*), *mouth* (tapir *mouth*, trench *mouth*), *shoulder* (frozen *shoulder*), *stomach* (hourglass *stomach*), *tongue* (fern leaf *tongue*)

2) general medical terminology: cancer (chimney-sweeps' cancer), *cough* (smoker's *cough*), *cyst* (daughter *cyst*), *disease* (comb *disease*), *fracture* (hangman's *fracture,* toddler's *fracture*), *fever* (field *fever*, hay *fever*, prison *fever*), *gallbladder* (hourglass *gallbladder*, porcelain *gallbladder*, strawberry *gallbladder*), *ganglion* (semilunar *ganglion*), *hernia* (pantaloon *hernia*), *itch* (straw *itch*, seven-year *itch*), *lesion* (coin *lesion*, wire-loop *lesion*), *macule* (coal *macule*, ash leaf *macule*), *nodes* (singer's *nodes*)
3) clinical terminology: *gastrectomy* (sleeve gastrectomy), *graft* (accordion graft, sieve graft), *granuloma* (swimming pool granuloma), *maculopathy* (bull's eye maculopathy), *myeloma* (solitary myeloma), *nodule* (coal nodule), *nevus* (spider nevus, blue nevus, strawberry nevus), *nystagmus* (miner's nystagmus), *ischemia* (silent ischemia), *paralysis* (rucksack paralysis), *pneumoconiosis* (miner's pneumoconiosis)

The examples in this section represent 90% of the corpus. The remaining metaphors can hardly be subsumed to any of the criteria applied insofar, if the head element of the HG were considered. Nevertheless, since its nature is so unique, it can hardly be associated with any of the categories in question. For practical purposes, only a few such miscellaneous medical metaphors are illustrated. They all include elements of the word stock, such as *accordion* (e.g. *accordion* graft), *cap* (e.g. cradle *cap*, Phrygian *cap*), *phenomenon* (e.g., doll's head *phenomenon*), and *sign* (e.g., broken straw *sign*, prayer *sign*).

Lexico-semantic relationships of denotative medical metaphors

Metaphoric synonymy is frequent in English medical nomenclature, and it can be illustrated with two- and three-word NGs, which occur either as synonymic pairs or synonymic clusters. Such synonyms NGs most often differ in either their former or their latter element, as follows:

(1) two-word NGs

a) whose D is preserved, e.g., *writer's cramp*, *writer's paralysis* or *writer's spasm*, *nutcracker phenomenon* and *nutcracker syndrome,* and *surfer's knobs* or *surfer's knots*
b) two-word NGs where the HEAD (H) is preserved, e.g., *prize-fighter's ear* and the *wrestler's ear* are also the synonyms of *cauliflower ear*

(Dorland 33rd ed.), *cane-cutter's cramp* or *heat cramp*, *anaemic infarct*, *pale infarct* or *white infarct* as well as *farmer's lung*, *harvester's lung* or *thresher's lung*

c) two-word NGs whose different linguistic patterns convey the same meaning, e.g., *swimmer's ear* and *tank ear*

(2) three-word NGs, where one of the following situations is noticeable

a) the determiner benefits from substitutable elements, e.g., *bird-breeder's* lung, *bird handler's* lung and *bird fancier's* lung, *cheese washer's* disease and *cheese handler's* disease, *mushroom picker's* disease or *mushroom worker's* disease

b) the structure of the determiner is different, e.g., *hen worker's* lung or *pigeon-breeder's* lung

The *surfer*-based examples under $(a)_{i)}$ make room for metaphoric paronymy, i.e., the existence of nearly similar and easily confusable denominations, such as *bursting fracture* vs *burst fracture*, which can create difficulties in learning or translating processes. The pairs which associate a denotative metaphor and an eponymic binomial are also phonemically confusing, e.g. *miller's disease* (also known as *nutritional secondary hyperparathyroidism*) vs *Miller('s) disease* (or *osteomalacia*).

The wide variety of patterns belonging to both pair- and cluster-elements of synonymic metaphorizations, which are presented below, are separated by a slash to avoid the obsessive use of "or", while colons separate synonymic terms from each other.

(1) The pairs of synonymic metaphorizations consist of variants of the same denomination:

a) where D is preserved, e.g., *cat-scratch* disease / fever; *nutcracker* syndrome / phenomenon; *coal-miners'* disease / *lung*; strawberry *hemangioma* / *mark*

b) where the two-word D varies partially, e.g., cheese-*handler* disease / cheese-*washer's* disease; *silver*-fisher's lung / *silver*-polisher's lung

c) where the two-word D is different, e.g., *miner's* cramp / *stoker's* cramp; *hen worker's* lung / *pigeon breeder's* lung

d) where completely different denominations have the same meaning, e.g., *teacher's* nodes / *vocal cords* nodules; *picker's* acne / acne *excorice*; *miner's* cramp / *heat* cramp; and finally, *cane-cutter's* cramp / *heat* cramp (the use of *heat* cramp here is confusing as it is perceived as a synonym for both *miner's* cramp and *cane-cutter's* cramp)

e) where the three-word D varies partially, e.g., *foot-and-mouth* / *hoof-and-mouth* disease

f) where the H element is preserved, e.g., welder's *eye* / arc welder's *eye*; *Tay's spot / cherry red spot*; bull's eye *lesion* / target *lesion*

g) where couples of patterns consist of different denominations, e.g., *baby blues* / *postnatal depression*; *mad hatter's disease / mercury poisoning*; *craft palsy / professional neurosis*; *brass founder's ague* / *metal fume fever* and *herpes zoster / shingles*
h) where English and Latin denominations co-exist, e.g., *blackwater fever* / *hemoglobinuria*, *pink eye* / *conjunctivitis*; *parrot fever* / *psittacosis*; *boxer's ear* / *pachyotia, barber's itch* / *sycosis barbae*; *drug eruption* / *dermatitis medicamentosa*; *flint disease* / *chalicosis*; *housemaid's knee* / *prepatellar bursitis*; *milk leg* / *phlegmasia alba dolens*; *pigeon breast* / *pectus carinatus*; *shipyard eye* / *epidemic keratoconjunctivitis*; *finger-and-toe disease* / *plasomodiophora brassicae*; *fishskin disease* / *ichthyosis*; *club hand* / *talipomanus*
i) where naturalizations and their fully or partially preserved foreign name co-exist, e.g., *cat-cry* or *cri du chat syndrome*, *black spot* or *tache noire, black fever* or *kala azar*
g) where English denominations and hybrid constructions joining an English and a foreign word co-exist, e.g., *caked breast / stagnation mastitis*; *cat-scratch fever / benign lymphoreticulosis*

2) three-synonym lines fall into one of these groups:
a) synonyms whose first element in the D structure is preserved, e.g., *mushroom* picker's disease / *mushroom* worker's disease / *mushroom* worker's lung and *writer's* cramp / *writer's* paralysis / *writer's* spasm
b) synonyms with roots in English denominations and loans, e.g., *brain fever* / *meningitis* / *cerebritis; club foot* / *cyllosis* / *kyllosis; Rocky Mountain spotted fever* / *boutonneuse fever* / *rickettsiosis*; *lawn-tennis leg / rupture of the plantaris muscle* / *coup de fouet; falling-sickness / epilepsy / grand mal; caisson disease* / *diver's paralysis* / *tunnel disease*
c) synonyms whose H is preserved, e.g., breakbone *fever* / date *fever* / dengue *fever*; farmer's *lung* / harvester's *lung* / thresher's *lung*; camp-*fever* / jail *fever* / typhus *fever*
d) completely different denominations, e.g., *hay fever / pollen coryza / pollinosis; hookworm disease / uncinariasis ankylostomiasis / helminthiasis*

Orthographic variation is extremely rare, with only the case of *carpet-layer's knee* vs *carpet layer's knee.*

Management of denotative medical metaphors

The syntagm "terminology management" is more often associated with the term "management" used in relation to policies at institutional level. Nevertheless, it may as well refer to any individuals' attitude and decision making on the pathway of their career construction. Our focus is on the personal management of medical terminology, viewed as "a special

vocabulary used by healthcare professionals for effective and accurate communication" (4). We interpret "terminological management" as the ability of a person to gradually acquire medical words with clear understanding, precision and accuracy. Users of denotative metaphors need to be fully aware of the traps that may create confusion and embarrassment. Any student's gradual acquisition of medical terminology should be based on personally established principles, rules and conventions, which begin with individual study. When things appear too complicated, it is the English for Medical Purposes (EMP) teacher who comes with helpful ideas and who, above all, must at least be familiar with basic medical knowledge. Success in the personal management of medical terminology is ensured by long hours of triangular teamwork, which involves the presence of a medical doctor, an EMP teacher and a medical student. This ideal model will hardly ever become true, but intervals of collaborative work in hospital spaces could favour the sporadic information-seeking discussions between medical academics and their students.

As specialist terminology is key to the academic study of medicine, much literature on the subject has been issued to this day. Most of the works on medical terminology (Wingerd 1-56, Cohen and Jones 1-122, Ehrlich 1-27) open with lexicology-based chapters that envisage the complexity of the medical language. The medical vocabulary, which is wide, comprehensive and variegated, brings together native and (sometimes unexpectedly lengthy) foreign words, multi-word lexical units, metaphors, synonyms, polysemous terms, a host of onyms (e.g., homonyms, backronyms, eponyms, toponyms, paronyms, and capitonyms) and denotative metaphors. Sometimes, denotative metaphors may appear confusing because they can be understood both in their literal and figurative meanings. For example, a person who has a *beer heart*, can have a glass of ruby-coloured raspberry sour beer, with friends in a pub, or s/he can own a beer mug with a realistic model of a human heart printed on it. In a medical context, a person who has a *beer heart* suffers from alcoholic cardiomyopathy.

Thus, to smooth the process of language acquisition and ensure the successful management of medical terminology, the opening chapters in medical terminology coursebooks propose a few directions to make this learning an easy and victorious task. Victory is constructed gradually, beginning with the first step, i.e., the mastering of basic lexical concepts, such as "affix" (manifested through prefixes, prefixoids, suffixes and suffixoids, infixes and interfixes), "root", "word", "term", "lexical class" (e.g., eponym, toponym, acronym).

Beginner medical students, as well as EMP academics, translator trainers, translator trainees and would-be translators and young professional translators must know a few general characteristics of the English medical

vocabulary. They should be aware that English medical terminology works with both words and word parts. Essentially, the usual medical vocabulary includes a diversity of simple words of Anglo-Saxon, Latin and Greek origin, affixed words and word combinations or multi-lexical units, i.e., simple words interconnected into unchangeable but semantically meaningful units. Affixed words result from the linking of a word part to the front, middle or end of a common word. Affixes may behave as either prefixes (e.g. *acro-* in *acromegalia*) or suffixes only (e.g., *-itis*, inflammation). On the other hand, *plasm* (i.e., originally a Greek suffix meaning "living substance, tissue") occurs both as a noun (e.g., *plasm*) and a suffix (e.g., *cytoplasm* and *nucleoplasm*).

Words and lexical structures of Greek origin occur in both transliterations, as in *brychein* ("to grind the teeth") (Taber 323) and translations (see *plasm* above). Most frequently, words and lexical formations of Latin origin are naturalized, but numerous adoptions also exist. Thus, *ambulance,* which originates in the Latin *ambulare* ("to move about") (Stedman 34), is an instance of adaptation; at the same time, *ad nauseam*, *nucleus dorsalis*, *organum spiralis*, and *fascia lata* are good examples of adoptions.

Immediately under the one-word level of medical terminology, which covers both common words (e.g., *influenza*, *cough*) and (unexpectedly) lengthy words (e.g., *encephalomyelopathy*, *lymphangioleiomyomatosis*), there lies the predominant layer of lexical formations in the medical nomenclature of diseases. It contains binomial (e.g. *daughter cyst*, *Addisonian crisis*, *Aleppo boil*), trinomial (e.g., *nasal dorsum fistula*, *Niemann-Pick disease*, *Gray zone lymphoma*) and polynomial structures (e.g., *Osler-Weber-Rendu disease*, *hand-foot-and-mouth disease*).

Denotative medical metaphors, which were shown to belong to each of these structural levels of medical terminology, are manageable semantic representations consisting of one- up to five-word lexical units. Once a person's mind-set accepts the principle of structural flexibility, the understanding and correct use of such terms will pose no problem. Metaphor users will be hardly surprised to discover that familiar words occur as both determiners and heads, or that diseases may carry extremely different names to refer to one and the same condition or disorder.

Conclusions

This study highlighted a few facets of the process of metaphorization, which, when followed by the process of lexicalization, brings new words and lexical units in the language of a nation or a profession. Metaphorization is a semantic change through which word associations stemming from analogies and comparisons become lexical units. These semantically changed lexical units,

which are used for denotative purposes, also function in the English medical language.

Secondly, it showed metaphorization as a productive word formation. It plays an important role in the process of disease naming: most denotative metaphors have no synonym, or if they have one, it most often is another denotative metaphor.

Thirdly, as denotative metaphors are both lexically and semantically interrelated, they may be confusing and rather difficult to understand or profitably used. The formal, structural and semantic distinctions that help learners master them successfully are not numerous, but they are all based on key notions of lexicon enrichment, such as word versatility, productivity, language flexibility, variability, and lexico-semantic interrelationships.

Our taxa of denotative metaphors presented their lexical and semantic features and emphasized the productivity of metaphorization, which has gradually enriched the English medical vocabulary.

All in all, the study envisages the complexity of medical terminology, which may hamper the young learners' efforts to acquire and master it successfully.

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