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Creating medical terminology: from Latin and Greek influence to the influence of English as the current *lingua franca* of medical communication

ABSTRACT

The language of medicine is a broad research field, so broad that there ought to be a special field of linguistics called medical linguistics. Its development, especially the development of medical terminology, is interesting both to medical historians and to linguists.

Hippocratic writings dating from the 5th and the 4th century BC contain many medical terms which were the foundation of the language of medicine in the Greek era. At the beginning of the first century AD Greek medical terminology was latinized and *stomachos* (gr.) turned into *stomachus* (Latin). This started the era of medical Latin. This Latin still contained numerous Greek terms, which resulted in a mixture of Latin and Greek terms and prefixes and suffixes thereof.

In the past medical terminology was borrowed from Greek and Latin but, today, with English becoming the language of international medical conferences, medical terms are often composed of words borrowed from English e.g. *bypass* or *screening*, these being terms accepted both in German and Croatian. The latter, however, tends to use the Croatian equivalents for the above mentioned terms.

Two attempts will be emphasized in this paper in order to illustrate the methods used in importing and creating new terms for medical concepts. The status of Greek and Latin medical terms in national languages will be briefly outlined. Special emphasis will be put on English terms in both German and Croatian languages of medicine.

Key words: borrowing, Croatian, English, German, Latin and Greek words, medical terminology, terminological principles

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1. Hippocratic writings and their influence on medical terminology

Hippocratic writings from 5th and 4th centuries BC are the oldest written sources of western medicine and they represent the starting point of the Greek era of the language of medicine. One would have thought that after the Roman conquest the medical Greek would have been replaced by Latin. However, since the Romans had no similar tradition and since most of the doctors in the Roman Empire were Greek, they imported the Greek medicine. The result of this medical Greek era is a vast number of terms of Greek origin in national medical languages nowadays. There are numerous names of diseases and symptoms in English such as *diarrhoea* (through-flow), *dyspnoea* (bad breathing) and *podagra* (a foot trap). The terms *Podagra* and *Dyspnoe* are used in German as well. Beside the term *Diarrhoea*, however, the German language also offers the naturalized term *Diarrhöe*. *Diarrhea* exists in English as well, however, only in the American English.¹

2. Celsus' translation of medical records and its influence on medical terminology

At the beginning of the first century AD a Roman aristocrat named Aulus Cornelius Celsus wrote *De Medicina*, an overview of medical knowledge based on Greek sources. Celsus had great difficulty with translating medical records, since most Greek medical terms had no Latin equivalents. Therefore, he explained the symptoms of a disease in Latin and used the original Greek term, written with Greek letters in his Latin text:

"Tum sique inbecillitas oritur, proximum est, ut infantes tenerosque adhuc pueros serpentia ulcera oris, quae ἄφθας Graeci nominant, vomitus, nocturnae vigiliae, auriumumor, circa umbilicum inflammationes exercent. Propriae etiam dentientium gingivarum exulcerationes, febriculae, interdum nervorum distentiones, alvi deiectiones; maximeque caninis dentibus orientibus male habent; quae pericula plenissimi cuiusque sunt, et cui maxime venter adstrictus est."²

"English translation by W.G. Spencer published in 1938: "At these periods should any indisposition arise, it is very probable that infants and children still of tender age should suffer from the creeping ulcerations of the mouth which the Greeks call **aphthas**, vomiting, insomnia, discharges from the ear, and inflammations about the

¹ *Englesko-hrvatski medicinski rječnik*, Školska knjiga, Zagreb, 2005, p. 149

² http://penelope.uchicago.edu/Thayer/L/Roman/Texts/Celsus/2*.html, (27 April 2012)

navel. Especially in those teething there arise ulcerations of the gums, slight fevers, sometimes spasms, diarrhoea; and they suffer as the canine teeth in particular are growing up; the most well-nourished children, and those constipated, are especially in danger." ³

The result of this Celsus' way of introducing medical terms is a mixture of Latin and Greek medical terms and of suffixes and prefixes thereof in national languages of medicine nowadays. Greek roots are sometimes used rather than Latin ones because they offer more possibilities with coining new words, especially compounds. Therefore the terms *nephrectomy* and *erythrocyte* in English and *Nephrektomie* and *Erythrozyt* in German were introduced rather than their Latin equivalents *excisio renis* and *cellula rubra*. This is the case with the use of prefixes and suffixes as well. The Greek prefix *hyper-* and its Latin equivalent *super-* both convey the meaning of "extremely; more or better than normal"⁴. Although it would be correct to say *supertension* since the word *tension* was derived from the Latin verb *tendere*, we say *hypertension*, because the Greek prefix has become more productive than the Latin one, thus creating a Greek-Latin hybrid word. The Germans are more precise regarding this example. They use the prefix *Hyper-* but they attached it to the stem *-tonie* which is derived from the word *Tonus* (gr. *τῶς*)⁵, thus creating a more precise composite word.

3. Paracelsus' attempt of creating medical terminology of a national language

Another significant development for the language of medicine took place in the Renaissance, a cultural movement, that brought rebirth and renewal in all fields. Paracelsus, whose name implies that he is equal or even greater than Celsus, is the one who brought renewal to the field of medicine. Apart from discovering new diseases and taking an approach different than those before him⁶ he created a new medical terminology in German, a language capable of developing and changing. He revolutionized the study of diseases by creating a bunch of new words through meaning change, derivation and compounds. He introduced new diseases taking into ac-

³ http://penelope.uchicago.edu/Thayer/E/Roman/Texts/Celsus/2*.html (27 April 2012)

⁴ *Oxford Advanced Learner's Dictionary of Current English*, Sixth Edition, Oxford University Press, New York, 2000, p.

⁵ *DUDEN Wörterbuch medizinischer Fachbegriffe*, DUDEN Bibliographisches Institut GmbH, Mannheim, 2012, p.771

⁶ The Galenists argued that a disease of certain quality and magnitude would be cured by a medicine of opposed quality and magnitude. The Paracelsians, on the other hand, argued that a poison in the body might be cured by a similar poison; see *Paracelsus, Five Hundred Years: Three American Exhibits*, Friends of The National Library of Medicine, Bethesda, Maryland, 1993, p. 8

count the place from which diseases originated e.g. *Franzosen* (syphilis). He also introduced terms for other sexually transmitted diseases such as *schlier* referring to both *ulcus molle* (soft chancre) and *ulcus durum* (hard chancre). He named the diseases regarding their occurrence e.g. *monatkrankheit* (menstruation) or regarding the situation in which the disease was brought on e.g. *bergsucht*⁷ (miners occupational disease). Topography-based naming is the most important procedure followed by Paracelsus in giving names to diseases and symptoms e.g. *hauptide* (headache), since it originates in the *hauptide* (Kopf; head) and *halswe* (sore throat), since it originates in the *hals* (throat). Modern German uses the term *Halsweh*, whereas the term *hauptide* had been modified into *Kopfweh*. Paracelsus' German medical terminology encompasses more than 3000 terms and expressions from all fields of medicine. Nevertheless, his influence on the medical nomenclature is not big. The language of medicine refuses to replace Latin terms with terms from national languages. However, thanks to Paracelsus, the international chemistry nomenclature still comprises the term *Alkohol* and uses it in compounds and derivations. The term *Zink*, originating from "Bergmannsdeutsch"⁸, is nowadays present in medical terminology of all national languages.

There remains a fact that Paracelsus was apparently way ahead of his time, since his attempts to use a national language as the language of medicine had failed. Latin and Greek remained languages of medicine up to the 19th century when national medical languages started to gain on importance.

4. English as the current *lingua franca* of medical communication and the consequences thereof

Nowadays the most influential medical journals are written in English and the result of this is that medical doctors choose English as the language of international communication. In the past medical terms were derived from Latin or Greek and today with English being *the lingua franca* of medical communication, apart from Greek and Latin terms, there are terms composed of words borrowed from English e.g. *Koronararterien-Bypass* or *Screening* and there are hybrid compounds, consisting of a Greek or Latin prefix or suffix and an English root e.g. *Biofeedback*. Doctors have

⁷ The term *bergsucht* (pneumoconiosis) is considered to be one of the first terms that refer to occupational diseases. Nowadays we come across the term *Managerkrankheit*, an occupational disease characteristic for the time we live in.

⁸ Karl-Heinz Weimann, "Mundart und Neuschöpfung in den Krankheitsnamen des Paracelsus", *Zeitschrift für Mundartforschung* (2/1953), p. 82

the choice between importing these terms directly into their own languages as Celsus did with Greek terms or translating them as Paracelsus did with German.

These two tendencies of creating national terms for medical concepts on one hand and using English terms to be more close to the medical international community on the other create a great number of synonyms in the language of medicine. One should use one term consistently since "the economy of expression is an important feature of scientific language"⁹. The avoidance of synonyms in the language of medicine is also one of "universal, generally accepted and well-known terminological principles"¹⁰ that help in the creation of new terms for new concepts or for the translation of terms from other languages. Although terminologists suggest principles according to which one could form medical terms in national languages, they are often not obeyed by the medical practice.

4.1. Using English medical terminology in a national language vs using medical terminology from a national language

The term *screening* is defined as "the process of testing large numbers of people to see if any of them have a particular type of disease"¹¹ Both German and Croatian use the English term, although they also offer the terms from their national languages i.e. German term *Vorfelddiagnostik* and Croatian term *probir*. The authors W.Frank, B.Konta and C. Peters-Engl gave their paper the title *PAP-Test zum Screening auf Zervixkarzinom*¹², although there is the German equivalent for the term *screening*. In their paper they also use the compounds *Screeningprogramme* and *Screeningmaßnahmen*, which suggests that authors sometimes prefer the use of English terms since it is easier to make compounds and since they can make themselves more understandable to the international medical community. Croatian terminologists also suggest the use of a descriptive term *biološka povratna veza* for the hybrid compound *Biofeedback*. In language use, however, the term *Biofeedback* is still *Ist-Norm*¹³, as the full name of the Croatian clinic Mens Sana as "ordinacija za

⁹ Lidija Štefić, Branka Krauth, Darija Omrčen, "Istoznačnice u stručnom jeziku medicine, stomatologije i kineziologije", *Hrvatski sportskomedicinski Vjesnik*, 2005, p. 125

¹⁰ Lana Hudeček, Milica Mihaljević, "Načela normiranja hrvatskih naziva s primjerima iz medicinskog nazivlja", in: Nina Ledinek, Mojca Žagar Karer, Marjeta Humar (ed.) *Terminologija in sodobna terminografija*, Inštitut za slovenski jezik Frana Ramovša ZRC SAZU, Ljubljana, 2009, p. 97

¹¹ *Englesko-hrvatski medicinski rječnik*, p. 505

¹² W.Frank, B.Konta and C. Peters-Engl, "PAP-Test zum Screening auf Zervixkarzinom", *Elektronische Zeitschrift der Deutschen Agentur für Health Technology Assessment des Deutschen Instituts für Medizinische Dokumentation und Information*, (1/2005), title page

¹³ Eugen Wüster, *Einführung in die allgemeine Terminologielehre und terminologische Lexikographie*, International Information Centre for Terminology, Springer Verlag, Wien/New York, 1985, p. 2

psihološke tretmane, biofeedback i psihosomatiku"¹⁴ suggests. This example shows that although domestic terms should be preferred before the foreign ones, often the foreign one is used. Croatian term *granični poremećaj* is recommended instead of the foreign term *borderline poremećaj*. *DUDEN Wörterbuch medizinischer Fachbegriffe* on the other hand recommends the use of the foreign term *Borderline-Persönlichkeitsstörung*. The journal *SPIEGEL ONLINE* gives the definition of the term: "Die "Borderline"- ("Grenzlinie"-) Störung heißt so, weil sie früher in den Grenzbereich zwischen neurotischen und psychotischen Störungen eingeordnet wurde - denn Symptome aus beiden Bereichen treten auf."¹⁵ This definition suggests that the term *Grenzliniepersönlichkeitsstörung* is interchangeable with the term *Borderline-Persönlichkeitsstörung*. This is only one isolated example since the medical profession prefers the English term, which is why one of the departments in ASKLEPIOS Klinik Nord in Hamburg is called *Station O52A – Beziehungszentrierte Psychodynamische Borderline-Therapie*.¹⁶

The term *bypass* has its equivalent *premosnica* in Croatian. In German the term *Bypass* is used, although it could be translated into German the same way as it was translated into Croatian (*Überbrückung*). This suggestion can be supported by the definition from *DUDEN Wörterbuch medizinischer Fachbegriffe*, which explains that *Bypass* is "Überbrückung eines krankhaft veränderten Blutgefäßabschnittes durch Einpflanzung eines Stückes einer Vene oder Arterie oder eines Kunstsstoffschlauchs."¹⁷ The term *bypass*, however is sometimes replaced in compounds by some other words from general German e.g. *Herz-Lungen-Maschine* as the equivalent for the English term *cardiopulmonary bypass*.

The term *coeliac disease* in English is sometimes also referred to as *coeliac sprue* and the term *Sprue* exists in German as well e.g. *einheimische Sprue*¹⁸. One should always use Greek or Latin term (if there is one) rather than the ones from English, French or other national languages. Although today more and more words tend to be derived from indigenous languages the internationalisms of Latin and Greek origin are not to be avoided, since Latin medical terminology is still used when there is a need for clear medical communication.

¹⁴ www.menssana.hr (11 September 2012)

¹⁵ <http://www.spiegel.de/wissenschaft/mensch/0,1518,715132,00.html> (27 April 2012)

¹⁶ www.asklepios.com (27 April 2012)

¹⁷ *DUDEN Wörterbuch medizinischer Fachbegriffe*, p.180

¹⁸ *DUDEN Wörterbuch medizinischer Fachbegriffe*, p. 729

4.2. Structural and meaning inconsistencies in using English medical terminology

Sometimes there are inconsistencies with English medical terms in national languages of medicine. In German the English term *RNA* and the German term *RNS* are both feminine, thus having the article *die*.¹⁹ This is justified with the term *RNS*, since the letter *S* in the acronym stands for *Säure*, the noun of feminine gender in German. However, the letter *A* in the acronym *RNA* stands for *acid*, and the noun *Azid* in German is neutral, thus having the article *das*.²⁰ Therefore, it would be more correct to use the neutral article *das* when referring to the noun *RNA*.

Terms consisting of personal names e.g. *Marfan syndrome* or *Ehler-Danlos syndrome* are mostly written with a hyphen in German e.g. *Marfan-Syndrom* and *Ehler-Danlos-Syndrom*. This principle of writing compounds consisting of personal names in German with a hyphen is also applied to deverbilized nouns. e.g. *Turn-over*. The word *turnover* in English is a noun and it is referred to as a noun in German as well:

Turn-over m od. s;-s: die stoffwechselfähige Umsetzung eines Stoffes im Körper²¹

This noun was formed in German according to the Anglo-American model in which there is a tendency of writing deverbilized nouns with a hyphen e.g. *sit-in*. According to this example this rule is in German applied to all English deverbilized nouns regardless the original procedure of word formation applied in English e.g. *turnover*.

Croatian terminologists Hudeček and Mihaljević suggest the use of shorter term if the longer one is too metaphoric. Therefore they suggest the usage of the term *mikropsija* instead of the term *syndrom Alise u zemlji čudesna*. The term *syndrom Alise u zemlji čudesna*, however, has a more wider meaning than *mikropsija* since it is defined as:

"...the presence of visual rather than somesthetic perceptual disturbances, e.g. metamorphopsia and/or visual hallucinations, but this change and broadening of Todd's definition of the AIWS turns it to a both scientifically and clinically useless concept."²²

Thus, if one wants to replace the longer metaphoric term with the shorter one, it is better to use the term *metamorphopsia* or in Croatian *metamorfopsija* since it encompasses both micropsia and macropsia:

¹⁹ DUDEN *Deutsches Universalwörterbuch*, Bibliographisches Institut & F.A.Brockhaus AG, Mannheim, 2003, 5. Auflage, p.1318

²⁰ <http://www.duden.de/rechtschreibung/Azid> (27 April 2012)

²¹ DUDEN *Wörterbuch medizinischer Fachbegriffe*, p. 790

²² <http://www.diskussionszentrum.com/downloads/alice--im--wunderland--syndrom.pdf> (11 September 2012)

metamorphopsia An anomaly of visual perception in which objects appear distorted in shape or of different size or in a different location than the actual object. It may be due to a displacement of the visual receptors as a result of inflammation, tumour or retinal detachment, it can be of central origin (e.g. migraine, drug intoxication, neurosis or brain injury), or it can be induced by recently prescribed myopic correction (e.g. micropsia) or presbyopic correction (e.g. macropsia), etc. Metamorphopsia can be detected with an Amsler chart.²³

In German this term is referred to as *Alice-im-Wunderland-Syndrom*. In English it is also referred to as *Todd's syndrome*, which could also be the alternative term in Croatian e.g. *Toddov sindrom*.

5. Concluding remarks

The above examples illustrate the state of the language of medicine nowadays. In the past Greek and Latin were the languages that were characteristic of the language of medicine. Today apart from words of Greek and Latin origin, there are words imported from national languages. And as medicine develops there are more and more new medical concepts that are to be named. If the concept is new and not yet employed in the target language one can either leave such terms in the original language in a translated text as Celsus did or create a new term according to "the linguistic exigencies of the target language"²⁴ as Paracelsus did.

Croatian language tends to be too puristic regarding the usage of English terms and sometimes Croatian terminologists go too far by applying *Soll-Normen*²⁵ thus provoking the loss of equivalence. German, on the other hand, tends to be more open to the English terms as the great number of English terms listed in the *DUDEN Wörterbuch medizinischer Fachbegriffe* suggests. This is also supported by the fact that in 2007 80% of all references listed in the medical journal *Deutsches Ärzteblatt* were English sources.²⁶

Although Paracelsus offered a variety of principles that can be applied to the formation of new medical terms in German one could say that Celsus' principle of keeping the original medical term in the target text is more often applied in German than the principle developed by his successor. In Croatian, however, there seems to

²³ <http://medical-dictionary.thefreedictionary.com/metamorphopsia> (28 September 2012)

²⁴ Wayne D.Cole, "Terminology: Principles and Methods", *Computers and Translation*, (2/1987), p. 83

²⁵ Eugen Wüster, *Einführung in die allgemeine Terminologielehre und terminologische Lexikographie*, International Information Centre for Terminology, Springer Verlag, Wien/New York, 1985, p. 2

²⁶ Christopher Baethge, "Die Sprachen der Medizin", *Deutsches Ärzteblatt*, (3/2008), p. 37

be a tendency towards Paracelsus' principle. There remains a question if it is more important to standardize the medical terminology of national languages or if it is more important to be more understandable to the international medical community, the voice of which is English and as such it has "growing intranational and international currency in medical communication"²⁷.

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²⁷ John Maher, "The development of English as an International Language of Medicine", *Applied Linguistics* (7/1986), p.206

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