



**THE ENGLISH OF THE HEALTH SCIENCES:
A NOTE ON FOREIGN BORROWINGS**
O Inglês da Ciência da Saúde: Notas sobre Empréstimos Lexicais

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“Twenty-six hundred years ago, the Asiatic Greeks of Ionia and the Italian Greeks in Magna Graecia began the speculative and investigational sciences, pushing the then Greek to its limits, pushing beyond those limits, riveting new meanings onto old words, smithing new words for new ideas and discoveries –philosophia, ‘the love of wisdom’, was supposedly first used by Phytagoras.

The sciences still go their robust way, iconoclastic but also indebted to and respectful of their ancient tradition. In anatomy, surgery, clinical medicine, and laboratory medicine, Greek, Latin, and Greco-Latin have always formed well over ninety per cent of the medical terms....”

(Joseph M. Patwell, 2003)*

Abstract

With medicine having a long, more than 2500-year-old history, it seems obvious that different nations must have contributed to its development, which has been accompanied by the creation of the terminology necessary to describe the discoveries made and to express the concepts that evolved in the course of this development. From the point of view of their linguistic origin, medical terms may have been built by applying the rules of their own code (the language of medicine), by borrowing words from other sub-codes (the language of computer science or statistics), or by borrowing words from foreign languages. This study analyses the third type of borrowings, i.e. words adopted from other cultures through medical English.

Key-words: *foreign influences; lexical borrowings; medical English; medical terminology.*

* Patwell, J.M. 2003. Fundamentals of Medical Etymology. In: D.M. ANDERSON (Ed.) 2003. Dorland's Illustrated Medical Dictionary XXIII. Philadelphia: Saunders/Elsevier. 30th edition.



**Resumo**

Sendo a medicina uma ciência com uma longa história, de mais de 2500 anos, parece óbvio que diferentes países tenham contribuído para seu desenvolvimento, que foi acompanhado pela criação da terminologia necessária para descrever as descobertas realizadas e para expressar os conceitos que evoluíram no curso de seu desenvolvimento. Do ponto de vista da origem linguística, os termos médicos podem ter sido construídos por meio da aplicação de regras de um código próprio (a linguagem da medicina), por empréstimo de palavras de outros subcódigos (a linguagem da informática ou da estatística), ou pelo empréstimo de palavras de outros idiomas. Este estudo analisa o terceiro tipo de empréstimo, ou seja, palavras adotadas de outras culturas por meio do inglês médico.

Palavras-chave: *influências estrangeiras; empréstimos lexicais; inglês médico; terminologia médica.*

**1. Introduction**

As Dirckx (1983: 105) so rightly put forth, no living language can remain pure for long unless its speakers live in total isolation. So any contact among different cultures, hence among their languages, shows certain effects from each of these contacts, especially in the form of additions to their vocabularies. One of the reasons why words are taken over by one language from another is the answer to a definite need, i.e. words are adopted because they express ideas that are new or because they are so intimately associated with an object or a concept that their acceptance involves acceptance of the words used to denominate them. This adoption of foreign words or “lexical borrowing” (Haugen, 1950; Hope, 1971) is one of the normal neological processes that every language has at its disposal to enrich its lexis. Since all loans are neologisms, the underlying cause of borrowing, from either internal or external sources, is fundamentally the same as that of neologisms in general, i.e. the need for language, as a means of communication and expression, to take account of changes in the nonlinguistic world.



Nevertheless, loanwords differ from other types of neologisms in the sense that their components or models are taken from external, and not from internal, sources.

One of the languages which have supplied other languages with many words is English whose transference of words to other languages started with the British Empire in the XVI century and followed later with World War II, when it became a *lingua franca* as a consequence of the dominant role of the United States of America all over the world. The use of English in international communication has been growing since then as any language “is maintained or declined in response to the amount of (new) information that it carries” (Maher, 1986: 208). A field in which English has been a contributor of terms is that of the health sciences. This is why great scholarly attention has been given to its influence on different medical terminologies such as, for example, Croatian (Gjuran-Coha, 2006), Czech (Bozděchová, 2006), French (Delamare & Gélis-Malville, 1990; Jammal, 1992), German (Schleyer, 1985), Romanian (Badea, 2008; Frinculescu, 2009), or Spanish (Alcaraz Ariza, 2000; Navarro, 2005; Alcaraz Ariza and Navarro, 2006), to name just a few.

Likewise, and as English has always been open to enrichment from other languages, there have also been numerous studies on the contribution to the growing of general English of languages such as Arabic (Peters, 1973; Cannon, 1994), Chinese (Knowlton, 1973; Cannon, 1988; 1990), French (Otman, 1989; Swallow, 1991), German (Pfeffer and Cannon, 1994), Hindi (Hawkins, 1984), Japanese (Knowlton, 1973; Cannon, 1984), Korean (Knowlton, 1973), Malay (Cannon, 1992), Russian (Manczak-Whgolfeld, 1984; Stacy, 1961), Scandinavian languages (Geipel, 1971; Ruiz Moneva, 1997), Spanish (Gooch, 1996; Rodríguez González, 1996; Segura, 1998), or Yiddish (Ornstein-Galicia, 1992), for example. The influence of foreign languages has not only extended to general English but also to a variety of specialised English such as that used in the field of health sciences. For instance, Chabner (2008), Dirckx (1983), and Roberts (1971) thoroughly examined its classical (Greek and Latin) components, whereas Coleman (1995) analysed its French and Latin terms, and Alcaraz Ariza (2005) studied its Spanish elements.



2. Purpose, corpus and methodology

With medicine having a long, more than 2500-year-old history, it is obvious that different nations must have contributed to its development, which has been accompanied by the creation of the terminology necessary to describe the discoveries made and to express the concepts that evolved in the course of this development. It is therefore our purpose in this paper to highlight some of the lexical borrowings or linguistic contributions made to Medical English by a number of foreign medical languages.

The terms discussed in the body of this paper were obtained from two different sources. Some of these terms were mentioned in the studies on medical English here- above referred to and the rest was randomly retrieved from the *Dorland's Illustrated Medical Dictionary*(2003). Although this dictionary delivers many entries, good definitions and a wealth of illustrations, we do know that no dictionary on the market is complete or perfectly accurate and that all of them may fail to include some terms, to identify the origin of some of them, or to misidentify that of some others. Nor can any dictionary be totally up to date, even those that now appear on the Internet. However imperfect it may be, we think that the consulted dictionary is a useful and reasonably accurate guide to the terminology of medicine.

As for their origin, loan words may have an “immediate” or “ultimate” source. By “immediate source” we mean words that entered English via languages different from their origin and by “ultimate source” we mean words that English borrowed directly from original languages, i.e. with no intermediate source. Examples of immediate source are the word *cassava*, an altered form of the Spanish word *casabe* or *cazabe*, which comes from the Haitian word *cazabi* (Alcaraz Ariza, 2005), the Carribean word *papaya* that entered via Spanish, or *jalap*, named after *Jalapa* for a twining eastern Mexican vine that penetrated via French. Examples of ultimate source are the words *syncope* and *systole* which were borrowed directly from Greek.

When collecting the terms listed in this paper the following criteria were taken into account:





- 1) Etymology (Greek, French, Latin, Spanish) mentioned in the entries of the consulted dictionaries,
- 2) Letters or letter sequences which may differ from the usual English spelling conventions (“ae”, “ö”/“oe”, “ü”/“ue”, “hy”, “ieux”, “ka”, “ko”, “ku”, “kh”, “kl”, “ñ”, “rh”, “tz”, “zz”, “sch”),
- 3) Presence of graphic stresses (*Achúcarro's stain*, *Béguez César disease*, *déjà vu*),
- 4) Plural morphemes which betray their non-English origin (*bronchi*<*bronchus*, *meninges*<*meninx*).

Let us now deal with some of the foreign influences that have contributed to the growth of Medical English terminology.

3. Anglo-Saxon influence

In today's medical English not many terms can be attributed to the oldest developmental period of English language, i.e. Anglo-Saxon, and these are basic anatomical terms such as arm, chin, finger, foot, gut, hair, head, hip, liver, mouth, or wrist, among others (Andrews, 1947; Dzuganova, 2002: 224).

4. Norman influence

The Normans, who were of Teutonic origin, spoke a dialect of French which was soon to become the medium of education and culture in England. Some medical terms that came into English during the Norman period and survive today are *balm*, *contagion*, *debility*, *leper*, *malady*, and *palsy* (Dirckx, 1983: 11)

5. Classical influence

Two languages are the richest foreign sources of European medical terminology. These are Greek and Latin. In ancient times, around 500 B.C., it was Greek that dominated the science of medicine. In the





Middle Ages and in the Renaissance this role was taken over by Latin. Apart from a few terms which still retain their original Greek form such as *amnion*, *hypospadias* or *opisthotonos*, the usual parts of speech which have been borrowed more or less intact from classical languages are affixes (prefixes and suffixes) and roots. Some of the classical prefixes which have been borrowed in their original form are, for example, the following ones:

a-/an- (*anemia*, *aphasia*)
de- (*decarboxylase*, *defibrinate*)
hyper- (*hyperglycemia*, *hyperthyroidism*)
pre- (*precancerous*, *preeclampsia*)
post- (*postpartum*, *postprandial*)
pseudo- (*pseudocyst*, *pseudopolyps*)
sub- (*subconscious*, *subhepatic*)
trans- (*transplantation*, *transurethral*)

As for classical suffixes, the following Greek ones have been taken unchanged:

-algia (*myalgia*, *neuralgia*)
-emia (*anemia*, *leukemia*)
-ia (*pneumonia*, *dyskinesia*)
-itis (*bronchitis*, *bursitis*)
-lysis (*dialysis*, *plasmolysis*)
-osis (*diagnosis*, *neurosis*)
-oma (*adenoma*, *hematoma*)
-uria (*hematuria*, *nocturia*)

On the contrary, the suffix *-atum* of Latin participles turned into *-ate* when being appended to Greek and Latin verb stems. This suffix is found in verbs such as *dialysate*, *desiccate*, *distillate*, *eluate*, *exudate*, *triturate*, *vaccinate*, and the here-above mentioned *defibrinate*.

Some unchanged classical roots, which usually function as combining forms, are as follows:

-cardi(o)- (*cardiograph*, *cardiology*)
-dem- (*endemic*, *pandemic*)



-*enter(o)*- (*enteritis, enterocleisis*)
 -*hem(a/o)* (*hematoma, hemobilia*)
 -*path(o)*- (*pathology, pathogenic*)
 -*ped(o)*- (*pedialgia, pedicure*)

The classical influence can also be noticed in terms/expressions which have been kept unchanged (*acanthus is nigricans, cancer, delirium tremens*) or taken nearly intact (*catharsis*<*katharsis*). This influence is likewise present in the plural forms of terms such as *aortae* (<*aorta*), *arthritides* (<*arthritis*), *cannulae* (<*cannula*), *coccyges* (<*coccyx*), *cortices* (<*cortex*), *endocardia* (<*endocardium*), *irides* (<*iris*), *metastases* (<*metastasis*), *patellae* (<*patella*), *pneumothoraces* (<*pneumothorax*), *sarcomata/sarcomas* (<*sarcoma*), or *spermatozoa* (<*spermatozoon*). Some inflectional endings may be kept in their original form (*nervusabducens, strabismus, tenesmus*) or disappear (*aneurysm, blast, cyst, polyp, spasm, symptom*). This same duality affects the Latin suffixes *-alis* and *-aris* that are replaced by the English *-al* and *-ar* in terms such as *abdominal, alveolar, anginal, dental, laryngeal, lumbar, muscular, or parenteral*. Some abbreviations present nowadays in medical English have also been taken from Latin without any change (*H.d.* <*hora decubitus*), whereas others have turned into hybrid forms through their combination with English terms (*HbCV*<*Haemophilus influenzae b conjugate vaccine, HbPV*<*Haemophilus influenza polysaccharide vaccine*).

Other anatomic terms like *canal, chamber, column, floor, vault,* and *wall* are on their side translations of the corresponding Latin ones. In addition, the entire human anatomy is basically named in Latin, whereas most new medical, chemical, and taxonomic terms are derived from Greek roots. The contribution of Greek to the English medical terminology is also illustrated by the presence of Greek letters in clinical and chemical terms (*β -amilase, α -dextrin-endo-1,6- α -glucosidase*) or in units of measure (*9,7 μ g, 8 Ω*). The adjectives *deltoid, lambdoid,* and *sigmoid* are derived from the lower-case Greek letters *delta* (Δ), *lambda* (λ), and *sigma* (ς), respectively. Likewise, Greek has contributed the symbols *+* (plus), *-* (minus) and \pm (plus or minus), as well as the two standard gender symbols denoting male ($\♂$) and female ($\♀$). Roman numerals, on their side, are commonly used in pharmacology, especially



when it comes to fill in prescriptions forms. Furthermore, medical terminology contains numerous terms and expressions which refer to classical myths: *Achilles' heel/tendon*, *aphrodisiac*, *aotic labyrinth*, *atlas*, *Artemisia*, *atropa*, *complex of Oedipus*, *hermaphroditism*, *morphine*, *venereal disease*, etc.

6. Romance influence

6.1. French language

Around the 7-8th centuries classical Latin died out and split into several vulgar languages, among them French which played a very important role as a medium for penetration of medical Greek and Latin words into English. Not to mention that after the French Revolution, French was mostly used by the European medical community. An example of the French penetration in medical English can be seen in the Greek suffix *-ia* which was changed to *-ie* and is represented in modern English spelling by *-y* (*atony*, *atrophy*, *dysentery*, *epilepsy*, *tetany*). The Greek suffix *-inē/-inos* turned into the Latin *-inal/-inus* and became the French suffix *-ine* which appears in terms ending in mute *-e* (*alanine*, *atropine*, *benzene*, *bromine*, *chlorine*, *cytosine*, *fluorine*, *iodine*, *jacobine*, *leucine*, *morphine*, *nicotine*, *phosphine*, *quinine*, *tyrosine*, etc.). The shortened form of this suffix is present in terms such as *albumin*, *hemoglobin*, *insulin*, or *penicillin*. The mute final *-e* is also proper of terms such as *dermatome* and *heterophile*. On its side, the suffix *-age* (<Latin *-aticum/-aticus/-icus* < Greek *-ikos*) is found in *appendage*, *bandage*, *frottage*, *lavage*, or *hemorrhage*, whereas the suffix *-ase* (< Greek *-asis*) is used to name enzymes (*acetylase*, *carboxylase*), and the suffix *-ose* (< Greek *-os*) is included in *dextrose*, *glucose* (Dirckx 1983: 70), *gulose*, *levulose*, etc.

Among other terms that have experienced multiple assimilations through Latin and French are *diet* (< French *diète* < Latin *diate* < Greek *diaita*), or *rheumatic* (< French *rheumatique* < Latin *rhematicus* < Greek *rheumatikos*). In some cases, it is difficult to distinguish whether a word came into medical English via French or via Latin because French



descends from Latin. If *croupe*, for example, has a French origin as it has no Latin equivalent, other terms such as *organ*, *hymen*, and *testicle* are of ambiguous French or Latin origin. This lack of certainty also applies to *mal*, which may come from either French or Spanish and which may appear alone or in combination with French terms in expressions such as *grand mal*, *haut-mal*, and *torsade de pointe*.

Likewise, of French origin are many medical terms and expressions that have preserved their original graphic accent such as *accolé* and its synonym *appliqué* (found in the hybrid expressions *accolé/appliqué form*), *accouchement forcé*, *crèche*, *débouchement*, *débridement* (present in the compound term *surgical débridement*) or *perlèche*. In some cases the assimilated term has lost its original French graphic stress: *declive* < French *déclive* < Latin *declivis*). From French are also other terms ending in *-ent* and *-eur* like *abouchement*, *accouchement*, *accoucheur*, *accoucheuse avivement*, *ballotement*, *bruissement*, *frotteur*, *laveur*, etc. Other simple and compound French terms are *avoir(-)du(-)pois* (applied to tables of weights and measures), *bruit*, *brosse*, *coeur en sabot*, *curette* (which also functions as the verb *to curette*), *goitre*, *grippe*, *invalid*, *jaundice*, *leper*, *migraine* (which has given way to the derivatives *migraineur*, *migrainoid*, *migrainous*), *manchette*, *nourish*, *nurse*, *tampon*, *ointment*, *pain*, *pipette*, or *venom*.

Another type of word very common in medical English (and in all medical languages) is the so-called eponym or proper name which may be applied to a structure, disease, sign or syndrome and which is often associated with the discovery or first clinical description of an object or disorder. The great presence of eponyms in medical languages is not surprising as Dirckx (1983: 79) explains that: “except for Linnaean taxonomy and perhaps geography, no system of nomenclature ever devised contains as many names of things derived from names of persons, as does the language of medicine.”

Eponymous expressions may be simple or compounds. Suffice it to mention the following ones among those from French origin:

- *Aran-Duchenne spinal muscular atrophy/disease* (< François-Amilcar Aran and Guillaume Benjamin Amand Duchenne de Boulogne), also known as *Duchenne-Aran syndrome* and



- Cruveilhier's atrophy/disease/palsy* (< Jean Cruveilhier),
- *Babinski sign/syndrome* (< Josef François Felix Babinski),
- *Bonnet-Dechaume-Blanc syndrome* (< Paul Bonnet, Jean Dechaume and Emile Blanc)
- *Cotte's operation* (< Gaston Cotte),
- *Couvelaire uterus* (< Alexandre Couvelaire),
- *Débove's treatment* (< Georges Maurice Débove),
- *Debré-Sémélaigne syndrome* (< Robert Debré and Georges Sémélaigne),
- *Lallemant-Trousseau bodies* (< Claude François Lallemant and Armand Trousseau),
- *Musset sign* (< Alfred de Musset).

In some cases the eponym is used as a base to form deriveterms:

- *marfanoid* (< Antoine Bernard-Jean Marfan),
- *Pasteurella* (< Louis Pasteur),
- *Nicotiana* (< Jean Nicot),
- *Sabouraudites* (< Raymond Jacques Adrien Sabouraud),
- *sadism* (< D.A. François, marquis de Sade), which is applied to genus names¹.

6.2. Spanish language

Although it does not rival French, Spanish has also contributed its share to the growing of medical English, especially in the field of eponyms, i.e. it is not rare to come up with simple and compound eponymous expressions such as *Barraquer's disease* (< Luis Barraquer Roviralta), *Cajal's cells* (< Santiago Ramón y Cajal), *Calleja's islands* (< Julián Calleja y Sánchez), or *Arias-Stella reaction* (< Javier Arias-Stella). Nevertheless, not all the referents of these expressions were Spaniards. Many of them correspond to physicians from Latin America who wrote in Spanish about diseases, syndromes or signs. Let us put forth eponyms

1. In taxonomy names spelled with an upper-case initial letter refer to genus names and names spelled with a lower-case initial letter refer to species names. This rule also applies to terms derived from proper nouns.



like *Albarrán's gland* (< Joaquín María Albarrán and Domínguez, from Cuba), *Argonz-Ahumada-Del Castillo syndrome* (< Joaquín Argonz, Juan Carlos Ahumada and Enrique Benjamíndel Castillo, from Argentina), *Carrión's disease* (< Daniel Alcides Carrión, from Peru), *Lucio's leprosy* (< Rafael Lucio Nájera, a Mexican physician), or *Opitz-Frias syndrome* (< John Marius Opitz and Jaime Frías, from Chile), among many others.

Although the diseases designated by the eponyms usually bear the surnames of the physicians who discovered or cured them, it may nevertheless happen that some medical eponyms honour famous public figures or patients. Such is the case of *Cinchona* (< countess of Chinchón, wife of the Spanish Viceroy of Peru) and *Diego blood group* (< surname of a Venezuelan family in whose blood the antigen was first reported in 1955). *Cinchona* has given way to numerous derivatives: *cinchona*, *cinchonic*, *cinchonine*, *cinchonidine*, and *cinchonism*, whereas *Diego blood group* may also appear in abridged form, *DI* (agglutinogen), with its two antigens, *Di^a* and *Di^b*. Other eponymous derivative forms are *Bartonella*, *bartonella*, *Bartonellaceae*, *Bartonellosis* and its variant *Bartonellosis*, named after Alberto Leopoldo Barton Thompson, a Peruvian physician.

Like in the case of medical expressions from French origin, there seems to be a tendency to preserve the original foreign terms with hardly any alteration. Nevertheless, some adaptations that Spanish loanwords undergo when being assimilated into the English linguistic system can be seen in the following cases: *cascara amarga* (< *cascara amarga*), *cascara sagrada* (< *cascara sagrada*), *murrina* (< *morriña*), *sarsa* (< *zarza*), *Fananas' cells/glia of Fananas* (< Silveria Fañanás), *jararaca* (< *jararacá*), or *Montezuma's/Moctezuma's revenge* (< Moctezuma), also known as *Aztec two-step*, one of the numerous jocular appellations given to the rigours of traveller's diarrhea.

Besides medical terms formed on proper names, geography has also been the source of toponyms or expressions used to name certain types of plants or afflictions, usually in recognition of the places of the first recorded outbreaks. Some toponyms from Spanish and American Spanish origin are *Andes disease*, *California disease*, *Colorado tick*



*fever, Salmonella Arizona, Mallorca acne, Oroya fever, San Joaquin (Valley) fever, Texas tick fever, and Salmonellis Montevideo*².

6.3. Italian language

Italian has contributed many eponymous terms to medical English: *Arch of Corti* (< Alfonso Giacomo Gaspare Corti), *De Crecchio's syndrome* (< Luigi De Crecchio), *Lugaro cells* (< Ernesto Lugaro), *Perroncito's apparatus/spirals* (< Aldo Perroncito), etc.

Eponyms are also found in derivative forms: *Eustachian catheter/tube/valve*, *eustachianography* (< Bartolomeo Eustachi), *Fallopian canal/ligament/pregnancy/tube*, *fallotomy* (< Gabriele Fallopio), *voltage*, *voltaic*, *voltmeter*, *voltmeter* (< Alessandro Volta), etc. Other English medical terms of Italian origin are *belladonna*, *belladonine*, *influenza*, *malaria*, *pellagra*, and *scarlatina*. *Veronal* (< city of Verona) is on its side a toponym applied to the first commercially marketed barbiturate.

6.4. Portuguese language

From Portuguese origin are terms such as *alastim*, also known as *abou-moukmouk* in Central Africa and *amaos* in South Africa, *ainhum*, an adaptation of the Yoruba (Nigerian) word *ayun*, *oralbino* and its derivative *albinism*, *andira*, etc. Eponymous expressions are *Andrade syndrome* (< Corino M. Andrade) and *Da Costa's disease/syndrome* (< Jacob Mendez Da Costa), whereas examples of toponyms are *Goa powder*, also known as *araroba powder*, *Bahia powder* and *Brazil powder*, *Natal boill/button*, etc.

6.5. Romanian language

Some eponymous expressions with a Romanian referent are

2. A more complete list of Spanish terms borrowed by medical English can be found in Alcaraz Ariza (2005).



Anghelescu's sign (< Constantin Anghelescu), *Babès's tubercles/nodules*, *babesia*, *Babesiella*, *babesiasis/babesiosis* (< Victor Babès), *Jonnesco's fold/fossa* (< Thoma Jonnesco), or *Marinesco/Marinescu's hand*, (< Georges Marinescu), which is alternatively named as *Marinesco/Marinescu's succulent hand* and *Marinesco/Marinescu's sign*.

7. Germanic influence

7.1. German language

Among German terms that joined the English medical terminology are *anlage*, *angst* (most frequently used in the collocations *existential angst* and *angst-ridden*), *drusen*, *gestalt*, *gitter*, *kernicterus*, *magenstrasse*, *mast*, *polkissen*, *quellung reaction*, *stab*, *treppe*, and *wasserhelle*³. *Barbiturate* and *ester* are adapted forms of the original German terms *Barbitusäure* and *Essig*, respectively, and the expression *mandelic acid* was named from *Mandel* (Dirckx, 1983: 70). *Witzelsucht* comes from the blending of two German words, *witzeln* and *sucht*. *Mastocyte* is another blend of two terms, but in this case one from German (*Mast*) and the other from Greek (*cyte*<*kytos*) (Dirckx, 1983: 70). Other German words present in medical English are *danereben* ‘talking next to’, *vorbeigehen* ‘passing by’ and *vorbeireden* ‘talking past’ which are alternately used in the so-called “symptom of approximate answers”, “balderdash syndrome”, or *Ganser syndrome*, this last eponymous expression being named after the German psychiatrist Sigbert Ganser who characterized it.

Within the field of initialisms, i.e. abbreviations whose components are pronounced one by one, are *K* (< *Koagulationsvitamin*) and *EKG* (< *Elektrokardiogramm*). *Sitzbath* is a partial translation of *Sitzbad*, whereas *antibody*, *ground substance*, and *roof plate* are literal translations of *Antikörper*, *Grundsubstanz*, and *Deckplatte*, respectively.

3. The upper-case initial letter mandatory for nouns in German is lost when passing into English.



Among the many numerous German eponymous expressions present in medical English are *Müller's muscle/sign* (< Friedrich von Müller), *Romberg's disease/sign/spasm/test/rombergism* (< Moritz Heinrich Romberg), or *Schwann's cell/membrane/nucleus/substance, schwannoma* (< Theodor Schwann). The surname of the German physician Karl Adolph von Basedow is found in the eponymous expressions *Basedow's coma/syndrome/disease (ocular) syndrome*. It also appears in the mixed expression *Jod-Basedow phenomenon*. (Dirckx, 1983: 80). The adjective *Wolffian* (< Caspar Friedrich Wolff) figures in the eponymous expressions *Wolffian body* and *Wolffian cyst*. Other eponymous derivatives are included in *Müllerian canal/capsule/duct* (< Johannes Peter Müller) as well as in *anti-Müllerian hormone, Müllerianinhibiting factor, Müllerian inhibiting hormone, Müllerian inhibiting substance*, and *persistent Müllerian duct syndrome*, which are usually abbreviated as *AMH, MIF, MIH, MIS*, and *PMDS*, respectively. Other eponymous derivatives from German origin are found in mixed forms such as *bilharzic, bilharzial, bilharzioma, bilharziosis, bilharzias, bilharziasis* (< Theodor Maximilian Bilharz), *hahnemannian/hahnemannism* (< Christian Friedrich Samuel Hahnemann), *hahnium* (< Otto Hahn), also referred to with the symbol *Ha*, and *Klebsiella* (< T.A.E. Klebs).

Two examples of toponyms of German origin are *Haff disease* and *Kaiserstuhl disease*, whereas *o.H.* (< *ohne Hauch* 'whithout breath') and *HED* (< *Haut-Einheits-Dosis*) are examples of abbreviations. The field of abbreviations is further illustrated by hybrid terms such as *Ka.* (< *Kapsel antigen*) and *kveim a.* (< *kveim antigen*).

7.2. Other Germanic languages

Other Germanic languages have also contributed in some measure to English medical terminology. Within the few Scandinavian words (Danish, Dutch, Norwegian and Swedish) that have penetrated into medical English in an assimilated form are words such as *clump, cough, croup, drug, ill, kidney, knuckle, leg, measles, mumps, scalp, scorbutic, shock, skin, skull, snot, or snuff*. (Dzukanova, 2002: 224).



As far as eponyms are concerned, some eponymous expressions originated in Danish language are:

- *Bartholin's/Bartholinian abscess/cyst/cystectomy/duct/gland/Bartholinitis, Bartholinectomy* (< Caspar Thomèson Bartholin the Younger),
- *Jacobson's canal* (< Ludwig Levin Jacobson),
- *Jenssen's disease* (< Edmund Jensen),
- *Jensen's sarcoma/tumour* (< Carl Oluf Jensen),
- *Rasmussen's aneurysm* (< Fritz Waldemar Rasmussen),
- *Rønne's nasal step* (< Henning Kristian Trappaud Rønne).

Of Dutch origin are *de Lange syndrome* (< Cornelia Catharina de Lange), *Heilbronner's thigh/sign* (< Karl Heilbronner), *Jansen's disease/test* (< W. Murk Jansen), *Jordan's anomaly* (< Godefridus H. W. Jordans), *van Lohuizen's syndrome* (< Cato H. J. van Lohuizen), *Vrolik's disease* (< Willem Vrolix), or *Waardenburg's syndrome* (< Petrus Johannes Waardenburg).

Of Norwegian origin are:

- *Aarskog syndrome* (< Dagfinn Charles Aarskog),
- *Andresen appliance* (< Viggo Andressen),
- *Brandt's disease/syndrome* (< Thore Edvard Brandt),
- *Danielssen-Boeck disease* (< Daniel Cornelius Danielssen and Caesar Peter Moller Boeck),
- *Jervell and Lange-Nielsen syndrome* (< Anton Jervell and Friedrik Lange-Nielsen),
- *Louset's manoeuvre* (< Jorgen Louset).

Swedish is the source of:

- *Angström's law/unit* (< Anders Jonas Angström), which has given way to the word *angstrom* (shortened as *Å* or *Å*) and whose spelling without diacritics is now more common in English,
- *Fahraeus-Lindqvist effect* (< Robin Fahraeus and Johan Torsten Lindqvist),
- *Grönblad-Strandberg syndrome* (< Ester Elizabeth Grönblad and James Victor Strandberg),



- *Ivemark's syndrome* (<Björn Isaac Isaacson Ivemark),
- *Sjögren's syndrome* (<Henrik Samuel Conrad Sjögren),
- *Waldenström macroglobulinemia/purpura/syndrome* (< Jan G. Waldenström),
- *Wohlfar-kugelberg-Welander syndrome* (<Karl Gunnar Vilhelm Wohlfart, Erik Klas Henrik Kugelberg and Lisa Welander).

8. Finno-Ugric influence

From the Finno-Ugric language family, which covers Estonian, Finnish, and Hungarian, some traced eponymous expressions are the Estonian *Bidder's ganglia/organ* (< Heinrich Friedrich Bidder), the Finnish *Forsius-Erikson syndrome* (< Henrik Forsius and Aldur W. Eriksson), *Imerslund's anaemia/syndrome* (< Olga Imerslund), also known as *Imerslund-Gräsbeck disease* (< Armas Ralph Gustav Gräsbeck) and *Imerslund-Najman-Gräsbeck anaemia/disease/syndrome* (< Emil Najman), as well as the Hungarian *Jendrassik's maneuver* (< Ernst Jendrassik), *Korányi's auscultation (percussion)* (< Baron Friedrich von Korányi), *Polya's operation* [<Eugen (Jenö) Alexander Pólya], or *Tellyesnickz* (<Kálmár Tellyesnickz).

A toponym of Finnish origin is *Aland eye disease* which is named after the Aland Islands in the Baltic Sea where this disease was first observed.

9. Slavic influence

Apart from eponyms, very few are the Slavic words that have come into medical English. For example, *miriachit/miryachitis* an adaptation of the Russian word *mirjačit* (Stacy 1961: 135), whereas *seltzeris* the modified form of *Selterser*, the Prussian village where the water was obtained and which is present in the trade names of various patent medicines (Dirckx, 1983: 77).

Of Czech origin are the following eponyms:

- *Asherman's syndrome* (< Joseph G. Asherman),



- *Frejka pillow* (< Bedeich Frejka),
- *Janosik's embryo* (< Jan Janosik),
- *Purkinje's cell (II/II)/conduct/conduction/fibres/figure/images/ law of vertigo/layer/network/phenomenon/vesicle* (< Jan Evangelista Purkinje).

With a Polish source:

- *Adamkiewicz's arteries* (< Albert Adamkiewicz),
- *Biernacki's sign* (< Edmund Adolfevich Biernacki),
- *Biesiadecki's fossa* (< Alfred von Biesiadecki),
- *Hellin's law* (< Dyonizy Hellin),
- *Jaworsky bodies/corpuscles/test* (< Walery Jaworsky)
- *Mikulicz aphtae/cell/disease/resection* (< Johann von Mikulicz-Radecki)

Of Russian origin:

- *Abrikosov's tumour* (< Aleksei Ivanovich Abrikosov),
- *Anichkov (Anichkow)'s myocyte/cell* (< Nikolay Nikolaevich Anichkov),
- *Betz cell/area* (< Vladimir Aleksandrovich Betz),
- *Iwanoff's (Iwanow)'s cysts* (< Wladimir P. Iwanoff/Iwanow),
- *Kashin (Kaschin)-Bek disease* [< Nikolai Ivanovich Kashin (Kaschin) and E. V. Bek (Beck)],
- *Kaes-Bekterev layer* (< T. Kaes and Vladimir Kikhailovich Bekterev),
- *Monakow's syndrome/tract/bundle/fascilus/fibres* (< Constantin von Monakow),
- *Pirogov's amputation/angle/triangle* (< Nikolai Ivanovich Pirogov),
- *Romanovsky (Romanowsky)'s stain/method* (< Dimitileonidovich Romanowsky).

10. Ameridian influence

Within some of the words belonging to Amerindian languages are *annona*, *coumarin* (a modified form of *cumaru*), *curare*, *guaiacum*



and its variant *guajacum*, *guanine*, applied to a type of syrup, *guarana*, *guaranine*, *ipecac*, *jaborandi*, or *kalagua*. *Peru* is found in the expression *balsam of Peru*, and *Tolú* (Colombia) has originated the expressions *balsam of Tolu/Tolu balsam* and their related compounds (*toluene*, formerly known as *toluol*, *nitrotoluene*, *dinitrotoluene*, *trinitrotoluene*).

11. Semitic influence

In the Middle Ages not only Latin but also Arabic substituted Greek in its role as a donor language to the language of medicine used in Europe. In addition, Arabic also contributed several words to medical English via French and Spanish, either from the period of French colonialism or the Moorish period of Spanish history. For example, *alchemy*, *alcohol*, *alkali*, *camphor*, *caramel*, *elixir*, *kalium*, *nitrate*, *senna*, *sugar*, and *syrup* are among the oldest Arabic words still current in the fields of chemistry and pharmacy. The word *alcohol* in its turn has been used to form compounds and derivatives such as *alcholemia*, *alcoholic*, *alcoholism*, *alcoholiz/sation*, *alcoholiz/se*, *alcoholometer*, *alcoholuria*, and *alcoholysis*. The prefix of Arabic origin *al-* is present in *alcabigenes*, *alcogel*, *alkali*, *alkaline* and *alkalinity*, whereas the Arabic suffix *-ol* is found in terms such as *acidol*, *alquinol*, *bolenol*, and *sorbitol*. The term *alcosol*, on its part, contains both the prefix *al-* and the suffix *-ol*. The word *bezoar* comes from *adizhar*, whereas *aniline* is a blend of Arabic and Persian and *gum Arabic* is the source of *arabinose*. The terms *dura mater* and *pia mater* are translations from Arabic into Latin, whereas *sophora* and *bejel* are the anglicized forms of the Arabic words *sofara* and *bajlak*, respectively. Of Arabic origin are *sow(-)dah* and *halzam* and some Arabic toponymous expressions are exemplified in *Aleppo/Bagdad/Gafsa/Biskraboil/button*.

In addition, Arabic numerals are often employed in a scale running from 1 to 4 (or 1-plus to 4-plus), as well as in the typing of bacterial and viral strains and the gauges of catheters, dilators, and suture materials.



12. African influence

Some medical terms and expressions from African origin are *craw-craw*, *chikungunya*, *chiufa* (also known as *kanyemba*) which refers to an acute gangrenous proctitis and colitis with high fever seen in Zambia (Southern Africa) and South America at high altitudes, *kwashiorkor*, and *ouabain*. Toponymous expressions are *Coomassie blue*, *Congo red*, *Kasai syndrome*, *Kordofan gum*, *Sudan III*, *sudanophil*, *sudanophilia*, and *sudanophilic*.

13. Asian influence

Asian languages have supplied *agar-agar*, *akamushi disease*, *amok/amuk*, *ayurveda*, *benzoin*, *beriberi(disease)*, *catechu*, *dhobie (itch)*, *gutapercha* and its synonym *ancrod*, *habu*, *kabureitche*, *kala-azar*, *kalak*, *kampo/kanpo*, *kava(-kava)* (and its synonyms *ava*, *awa*, *sakau*, *yaqona/yanggona*), *kang cancer*, *kangri(-)burncancer/carcinoma*, *karaya gum*, *runche*, *sago*, *tsutsugamushi disease/fever*, or the derivative *urushiol* (<urushi).

Toponyms from Asian origin are Bengal rose, Delhi belly/boil/button, Kalmuk idiocy, kaolin and its derivative kaolinosis (also called China clay), Katayama fever/disease/syndrome, Kyasanur Forest disease, or Minamata disease. As far as eponymous expressions of Asian origin are concerned, they are very numerous and suffice to mention the following Japanese ones:

- *Horada's disease* (< Einosuko Horada),
- *Ishihara's charts/tests* (< Shinobu Ishihara),
- *Iso-Kikuchi syndrome* (< Ryosuke Iso and Ichiro Kikuchi) ,
- *Mitsuda's test* (< Kensuke Mitsuda),
- *Miyagawanella* (< Yoneji Miyagawa),
- *Niikawa-Kuroki syndrome* (< Yoshikazu Kuroki and Norio Niikawa),
- *Shigella/shigella* (< Kiyoshi Shiga).



14. Conclusion

The underlying cause of linguistic and semantic borrowing is mainly the need for any language as a means of communication and expression to take account of changes in the non-linguistic world. Although the vast majority of foreign words listed in this paper are usually not new accessions to medical English, their inclusion in a medical up-to-date, well-known and prestigious dictionary such as the *Dorland's Illustrated Medical Dictionary* as well as in other consulted sources evinces that at least some of them are still in use today. In addition, their presence in this medical dictionary is on the one hand a proof of their contribution to the growth of the English language of health sciences and, on the other hand, that they rightfully belong to the medical English word stock. Nevertheless, their sometimes non-English morphological structure, pronunciation, and spelling illustrate that some of them have never been completely assimilated despite being adopted a long time ago. A last point worth noting down is that as interesting as the number of words borrowed is the kind of patterns into which these words fall. English being a nominalizing language, the bulk of loans borrowed belong to the nominal category, the adjectival one playing a very small role in the growth of medical English. This nominal category includes different structures, mainly eponymous expressions, derivatives (usually involving suffixed forms), compounds, toponyms, and even shortenings.

This resulting varied composition leads to state that medical English is, like any other medical language in the world, *a museum in words from different origins* (Dirckx, 1983: 65), and that borrowing has to be contemplated as a reflection of the standing progress of medicine (and hence of humanity) which needs an appropriate increase in its vocabulary to provide a fluid scientific communication.

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References

- ALCARAZ ARIZA, M.Á. 2000. *Anglicismos en el lenguaje de las ciencias de la salud*. CD-ROM-published Doctoral Thesis. Alicante: Universidad de Alicante.



- _____ 2005. Medical English: a short study of Spanish borrowings. *Lebende Sprachen*, **50.2**: 58–61.
- _____ & NAVARRO, F. 2006. Medicine: use of English. In: K. BROWN (Ed.), *Encyclopedia of Language and Linguistics*. Ann Arbor: Elsevier. 2nd ed. pp.752-759.
- ANDERSON, D.M. (Ed.) 2003. *Dorland's Illustrated Medical Dictionary*, XXIII. Philadelphia: Saunders/Elsevier. 30th edition.
- ANDREWS, E. 1947. *A history of scientific English. The story of its evolution based on a study of Biomedical terminology*. New York: Richard R. Smith.
- BADEA, O. 2008. Eponyms – a terminological resource in the Romanian medical language. *Studii și cercetări de onomastică și lexicologie (SCOL)*, **1-2**: 19-25.
- BOZDECHOVÁ, I. 2006. Anglicisms in contemporary Czech medical terminology and inspecialized medical texts. Paper presented at the International Conference on Anglicisms in Europe. University of Regensburg, Germany, 26-28/09/2006.
- CANNON, G. 1984. Zero plurals among Japanese loanwords in English. *American Speech*, **59**: 149-158.
- _____ 1988. Chinese borrowings in English. *American Speech*, **63**: 3-33. Durham, NC: Duke University Press.
- _____ 1990. Sociolinguistic implications in Chinese-language borrowings in English. *International Journal of the Sociology of Language*, **86**: 41-55. Berlin/New York: Mouton de Gruyter.
- _____ 1992. Malay borrowings in English. *American Speech*, **67**: 134-162. Durham, NC: Duke University Press.
- _____ 1994. *Arabic borrowings in English: an historical dictionary*. Wiesbaden: Harrassowitz.
- CHABNER, D.E. 2008. *Medical terminology: a short course*. Philadelphia: Saunders. 5th ed.
- COLEMAN, J. 1995. The chronology of French and Latin loan words in English. *Transactions of the Philological Society*, **93**: 95-124. Hoboken, NJ: Wiley-Blackwell.
- DELAMARE, J. & GÉLIS-MALVILLE E. 1990. Thoughts on the current evolution of the French medical language. *Revue du Praticien*, **40.3**: 249-250. Paris: Global Média Santé.



- DIRCKX, J.H. 1983. *The language of Medicine: its evolution, structure and dynamics*. N. York: Praeger.
- DZUGANOVA, B. 2002. A brief outline of the development of medical English. *Bratislava Medical Journal*, **103.6**: 223-227. Bratislava: AEPRess.
- FRINCULESCU, J.C. 2009. The physiology of English as a lingua franca in Medicine. *Fiziologia – Physiology*, **19.2(62)**: 4-6. Timisoara: The Romanian Society of Physiological Sciences.
- GEIPEL, J. 1971. *The Viking legacy: the Scandinavian influence on the English and Gaelic languages*. Newton Abbot, Devon: David & Charles.
- GJURAN-COHA, A. 2006. Anglicisms in Croatian medical terminology. Paper presented at the International Conference on Anglicisms in Europe. University of Regensburg, Germany. 26-28/09/2006.
- GOOCH, A. 1996. Aspects of the incidence of hispanicisms in British English: a study in language, history, politics and psychology. In: F. RODRÍGUEZ GONZÁLEZ (Ed.), *Spanish loan words in the English Language. A tendency towards Hegemony Reversal*. Berlin/ New York: Mouton de Gruyter. 231-251.
- HAUGEN, E. 1950. The analysis of linguistic borrowing. *Language*, **26**: 210-231. Washington, DC: Linguistic Society of America.
- HAWKINS, R.E. 1984. *Common Indian words in English*. Delhi: Oxford University Press.
- HOPE, T.E. 1971. *Lexical borrowing in the Romance languages: a critical study of italianisms in French and Gallicisms in Italian from 1100 to 1900*. Oxford: Blackwell.
- JAMMAL, A. 1992. Is the hybridization of French medical language inevitable? *Journal de Radiologie*, **73.3**: 213-214. Paris: Société française de radiologie médicale/Elsevier-Masson.
- KNOWLTON, E.C. 1973. Chinese, Japanese, and Korean loanwords in Webster's Third. *American Speech*, **45.1**: 8-29. Durham, NC: Duke University Press.
- MAHER, J. 1986. The development of English as an international language of medicine. *Applied Linguistics*, **7.2**: 206-218. Oxford: Oxford University Press.
- MANCZAK-WOHGOLFED, E. 1984. On some Russian words in the British Press. *Kwartalnik Neofilologiczny*, **31.3**: 351-354. Warsaw: Polish Academy of Sciences.

- NAVARRO, F.A. 2005. *Diccionario crítico de dudas inglés-español de medicina*. Madrid: McGraw-Hill/Interamericana de España, S.A.U. 2nd ed.
- ORNSTEIN-GALICIA, J. 1992. Affective borrowing from Yiddish in colloquial American English: diachronic and synchronic aspects — and 'translatability'. *Meta*, **37.3**: 450-464. Montréal: Les presses de l'Université de Montréal.
- OTMAN, G. 1989. En français dans le texte: étude des emprunts français en anglo-américain. *The French Review*, **63.1**: 111-126. Carbondale: American Association of Teachers of French.
- PETERS, J. 1973. *Arabic contributions to the English vocabulary*. Don Mills, Ontario: Peters.
- PFEFFER, J.A. & CANNON G. 1994. *German loanwords in English: an historical dictionary*. Cambridge: Cambridge University Press.
- ROBERTS, E. 1971. *Medical terms. Their origin and construction*. London: William Heinemann Medical Books.
- RODRÍGUEZ GONZÁLEZ, F. 1996. *Spanish loanwords in the English language: a tendency towards hegemony reversal*. Berlin: Mouton de Gruyter.
- RUIZ MONEVA, M.A. 1997. A relevance theory approach to the Scandinavian influence upon the development of the English language. *Revista Alicantina de Estudios Ingleses*, **10**: 183-191. Alicante: Departamento de Filología Inglesa de la Universidad de Alicante.
- SCHLEYER, F. 1985. Anglicisms in the German medical vocabulary. *Tierärztliche Praxis*, **13.2**: 267-270. Stuttgart: Schattauer.
- SEGURA, J. 1998. Some thoughts on the Spanish language in Medicine. In: H. FISCHBACH (Ed.). *Translation and Medicine*. Amsterdam/Philadelphia: John Benjamins. pp 37-48
- STACY, R.H. 1961. A note on Russian words in an American dictionary. *The Slavic and East European Journal (SEJ)*, New Series, **5.XIX**: 132-138. Retrieved from <http://www.jstor.org/stable/304461>, last assessed: 14/10/2008.
- SWALLOW, H. 1991. The French loanword in current British English: a tour d'horizon. *Cahiers de l'Institut de Linguistique de Louvain*, **17.1-3**: 137-151. Leuven: Peeters Publishers.



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