Translation and the language(s) of medicine: Keys to producing a successful German-English translation

Gabi Berghammer

Part I: The words of medicine

Language and the history of medicine

Medical translation, together with religious translation, may be one of the oldest domains of translation: the sufferings of the body and soul have always been our central preoccupation [1]. The scientific methods that characterize modern Western medicine are traceable to Classical and Hellenistic Greece (500-30 BC). During this period, Greek medicine departed from the divine and moved towards logical reasoning [2]. It passed on its traditions first to the Roman Republic (509-31 BC) and the Roman Empire (31 BC-476AD), and then to Medieval Europe (1100-1500 AD). During this process, medical writing developed as a technique for travelling medical scholars to communicate their ideas [3].

When Greece was absorbed by the Roman Empire (146 BC), the centres of learning moved from Greece to Egypt. However, Greek physicians maintained their importance, and Greek medical writings were translated into Arabic. Only a small part was translated into Latin [4]. After the demise of the Roman Empire in the 5th century, most works of the Greek physicians were lost to Western Europe. For example, the writings of the travelling medical scholar Galen (129-200 AD) were unknown in the West until translated from Arabic into Latin during the 11th and 13th centuries, when Western Europeans began to rediscover Greek scientific texts due to the discovery of Arab repositories of learning in Spain and elsewhere during the Crusades [3]. The Arabic language had contributed comparatively little to the language of medicine, but it provided access to the Greek system of science [3]. In the 15th century, after the Ottoman conquest of Constantinople, Greek scholars migrated to Italy and brought with them the ancient texts, which were then directly translated into Latin [5].

Between 1000-1800 AD, Latin was the teaching medium at the great European universities, and it absorbed Greek and Arabic medical terminology by transliteration or overlay with Latin prefixes and suffixes [3]. Because of the increasing need to communicate with physicians without university training, students, and patients, Latin as the language of medicine had practically come to an end by 1800, and was almost entirely replaced by local languages—all of which, however, retained the Graeco-Latin terminological core [3].

Throughout history, dominance in knowledge has had repercussions on language relationships. Since the second half of the 20th century, probably as a direct consequence of U.S. leadership in many technical fields, English has become the lingua franca for medical research, and English terms have been imported into many other languages. Even though the advantages of a common language of research are obvious, the predominance of English places native speakers at a competitive advantage over those who first have to acquire sufficient linguistic skills to communicate their ideas and findings in a language foreign to them or to read English material [6]. For medical translators, of course, this is good news.

Many people still believe that anyone who speaks two languages can translate. However, a prerequisite of being a translator is to have an excellent command of both the source and target languages and to have strong translation skills. But how do you become a medical translator?—By learning the language of medicine.

Medical terminology

Graeco-Latin core

Let us first take a look at terminology. As we have seen, much of the medical terminology of Western European languages is made up of roots and affixes drawn from Greek and Latin. The advantages of the Graeco-Latin core are that it almost serves as an artificial language; it no longer changes because ancient Greek and Latin are dead languages, and it is precise and internationally comprehensible [7, 8]. When I tell people that I am a medical translator, the first thing many say is, “Oh, so you must have a solid command of Greek and Latin”. Well … not exactly.

It certainly helps to know that hem [gr.] means ‘blood’ and adip [lat.] means ‘fat’. However, medical parlance has not obeyed the rules of word formation. For example, Greek and Latin components have been freely combined into Graeco-Latin hybrid words [9], such as ‘haemoglobin’/Hämoglobin or ‘adipolysis’/Adipolyse. Even though this applies to both English and German, the translator will soon find that medical texts are full of potential pitfalls, such as changes in spelling, changes in prefixes and suffixes, parallel forms, and root switches from Greek to Latin and vice versa [9].
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Changes in spelling
Transliteration of Greek and Latin letters has not always resulted in the same spelling in English and German [9]. For example, the English ‘haematopoiesis’ becomes Hämato poese in German, dropping the ‘i’ from ‘-poiesis’. The same is true for ‘ovariectomy’, which is Ovar ektomie in German. Conversely, German adds an ‘i’ to ‘hypokalaemia’ and turns it into Hypokaliämie. Why then, are ‘hypocalcaemia’ and Hypokalzämie spell the same? The English ‘quinone’ is Chinon in German, and ‘suggillation’ loses its first double letter and becomes Sugillation in German.

Changes in affixes
The challenge in translating prefixes is that they do not always tally in English and German [9]. For example, the English ‘constipation’ becomes Obstipation in German, ‘disinfection’ becomes Desinfektion, and ‘intestinal absorption’ becomes intestine R e s o r p t i o n. In English, ‘disassimilation’ and ‘dissimilation’ are used synonymously, whereas German uses only Dissimilation.

The same for suffixes. Thus, the English ‘cholesterol’ is Cholesterin in German. The German translation of ‘pulmonary artery’ is Pulmonalarterie, whereas ‘tubal pregnancy’ becomes Tubargravidität. ‘Thymic leukaemia’ is thymogene Leukämie in German, but the English ‘lymphogenous leukaemia’ becomes lymphatische Leukämie. And ‘disinfected’ is desinfiziert (Figure 1).

Switches in Greek or Latin roots
Not only affixes are handled differently in English and German [9]. Sometimes a Greek root in one language gives way to Latin, and vice versa. For example, the English ‘mastadenoma’, a term based on the Greek root mast for ‘breast’, becomes Mammanadenom in German, a term based on the Latin root mamma. The English ‘oocyte’ [gr.] has both a Greek and a Latin equivalent in German, i.e. Oozyt and Ovozyt [lat.]. The English Hypert onie [gr.] is ‘hypertension’ [lat.] in English.

Conversely, the English ‘pituitary’ [lat.] is hypophysär [gr.] in German. In English, ‘seminuria’ [lat.] and ‘spermatura’ [gr.] exist side by side, whereas German uses only Spermaturie. The same is true for the English doublets ‘venesection’ [lat.] and ‘phlebotomy’ [gr.], which is Phlebotomie in German.

Parallel forms
Another pitfall awaits the translator when a term in one language has several equivalents in the other. For example, to translate the English ‘metabolism’, German offers both Metabolismus and Metabolisierung. However, the two are not interchangeable. Metabolismus, or Stoffwechsel, refers to the chemical processes occurring within a living cell or organism that are necessary for the maintenance of life, whereas Metabolisierung, or Biotransformation, refers to the chemical alterations of a compound which occur within the body to excrete this compound.

Terms from common speech
Another characteristic of medical terminology is that it consists of numerous words from everyday speech whose basic meaning has been extended to medical uses [9]. The challenge for the translator is to spot these terms as having a specific medical meaning.

A well-known common-speech word with a specific medical meaning is ‘history’, referring to the time before the patient’s introduction to medical care, and its German equivalent Krankengeschichte. An interesting use of language is the phrase ‘past medical history’. In common speech, ‘past history’ would appear redundant. In a medical context, however, ‘past medical history’ has a specific meaning, referring to the history of previous illnesses as opposed to the ‘history of the present illness’, terms that may be translated into German as Vorgeschichte früherer Krankheiten and Vorgeschichte der augenblicklichen Erkrankung.

Another example is the word ‘tender’, whose medical meaning differs somewhat from its meaning in everyday language. In medicine it has nothing to do with being kind and loving but is used to refer to the feeling of pain when touched. A possible German translation is druckempfindlich.

English terms adopted in German
As the influence of Greek and Latin on the language of medicine shows, it is sometimes easier to borrow foreign terms together with the science. In line with the predominance of English in science, medical German is full of terms imported from English, such as Compliance, which may (but perhaps should not) be rendered in German as something like die Bereitschaft des Patienten zur aktiven Mitwirkung an therapeutischen Maßnahmen.

Other English terms may have a German equivalent, such as first-pass effect, in German First-pass-Effekt, which could also be rendered as Effekt der 1. Leberpassage, or Acute Respiratory Distress Syndrome, which translates as Schocklunge or akutes Lungensyndrom, but German usage often prefers the English over the German term.

Many English terms adopted in German do not even have a German equivalent, such as Face lifting, Intent-to-treat, Surfactant, or Restless-Legs-Syndrom, to name only a very few.
False friends
False friends cause difficulty not only in our personal lives, but also in the life of the translator. False friends are word pairs that look like they might mean the same thing in both languages but don’t. Some examples that immediately come to mind are ‘drug’ (Arzneimittel) and Droge (addictive drug), ‘ambulance’ (Krankenwagen) and Ambulanz (outpatient department), ‘gift’ (Geschenk) and Gift (poison), ‘pregnant’ (schwanger) and prägnant (succinct), or ‘preservative’ (Konservierungsmittel) and Präservativ (condom).

A perhaps less obvious but potentially serious example is the English term ‘narcotics’, a false friend of the German Narkotika. Thus, ‘narcotics’ and its synonyms ‘opioids’ or ‘narcotic analgesics’ translate into German as Opioid or Opioid-Analgetika. The German term Narkotika is synonymous with Allgemeinanästhetika and translates as ‘general anaesthetics’.

Synonyms
Speaking of synonyms—‘medspeak’ is full of concepts that go under several names which are basically equivalent but may differ according to whether they derive from anatomical, pathogenic, historical, or descriptive considerations [9]. For example, ‘accessory mamma’ is the name given to the presence of more than one pair of breasts, also referred to as ‘supernumerary mamma’, ‘mamma accessoria’, ‘polymastia’, and ‘hypermastia’. German equivalents are akzessorische Mamma, Mamma accessoria, Polymastie, and Hypermastie. One of these terms, i.e. ‘hypermastia’/Hypermastie, also applies to a second concept, i.e. oversize of the breasts, and is synonymous with ‘macromastia’ in English and Mammalhypertrophie in German. But beware—‘macromastia’ is, of course, not synonymous with ‘polymastia’.

Also, for many learned terms, both English and German have a synonym in everyday speech, such as ‘haemorrhage’/‘bleeding’ and Hämorrhagie/Blutung, ‘myopia’/’shortsightedness’ and Myopie/Kurzsichtigkeit, or ‘pruritus’/‘itching’ and Pruritus/Juckreiz. Which of these synonyms is used in writing and translation will depend on the genre or type of text to be translated and on the needs and expectations of its audience.

Eponyms
Eponyms are terms adapted from names of famous scientists. Sometimes, the same eponym is used in both languages, such as ‘Wolff-Parkinson-White syndrome’. Alternatively, an eponym in one language may have a non-eponymic equivalent in the other, such as the German Budd-Chiari-Syndrom, which translates as ‘venous occlusive disease’. Also, an eponym in one language may correspond to another eponym in the other language, as is the case for ‘Henderson-Jones syndrome’, which is Reichel-Syndrom in German.

To complicate matters further, some eponyms are synonymous, such as ‘Basedow’s disease’, ‘Graves’ disease’, and ‘Flajani’s disease’. In German, the only synonym for Basedow-Krankheit is Morbus Basedow. Conversely, the same eponym may apply to different disorders, such as ‘Paget disease’/Paget Krankheit, which applies to three distinct conditions: osteitis deformans, carcinoma of the breast, or carcinoma in the anogenital region. Of course, each of these concepts again has a number of synonyms of their own.

Abbreviations and acronyms
The fast growth of scientific knowledge in the past half century has generated great numbers of new terms, particularly multiterm words, such as ‘chronic obstructive pulmonary disease’ or ‘gonadotropin-releasing hormone’. Limited journal space and the disinclination to repeat long terms have led to frequent coinages of both abbreviations and acronyms (i.e. abbreviations formed from the initial letters of a compound term serving as pronounceable words). Thus, the above terms are often simply referred to as COPD and GnRH.

Many abbreviations will not pose a problem to the translator because they are the same in both languages, such as GTT (‘glucose tolerance test’–Glukosetoleranztest) or SLE (‘systemic lupus erythematosus’–systemischer Lupus erythematosides). However, what the translator should know is that German often simply adopts the English abbreviation. Thus, even though ‘chronic obstructive pulmonary disease’ translates as chronisch-obstruktive Lungenerkrankung, the abbreviation used in German is COPD, and the hormone Gonadoliberin may even be better known by its English abbreviation GnRH.

Alternatively, a German author may prefer to use the abbreviation ASS for Acetylsalicylsäure, KHK for koronare Herzkrankheit, and BKS for Blutkörperechenkung. The English equivalents of these abbreviations are ASA (‘acetylsalicylic acid’), CHD (‘coronary heart disease’), and ESR (‘erythrocyte sedimentation rate’).

Names of active substances
Drug names can present problems during translation because different countries may have different approved names. In most cases, national names are the same as the recommended International Non-proprietary Names (rINNs) introduced in the 1960s by the WHO. In other cases, the national and international names are similar, with only trivial differences, such as the British ‘cyclosporine’ and the international ‘ciclosporine’. Other examples of substances whose British Approved Names (BANs) differ from the rINNs include the antineoplastic drug ‘mitoxantrone’, which was converted to ‘mitozantrone’ because it was considered too similar to the proprietary name of the anticancer agent ‘Mitoxana’. Also, the BAN for the loop diuretic ‘frusemide’ differs from the rINN ‘furosemide’ because of potential confusion with ‘furamide’ [10].

In some cases, however, the national names are significantly different from the INNs. Among these are the sympathomimetics ‘adrenaline’ (epinephrine) and ‘noradrenaline’ (norepinephrine) or the local anaesthetics ‘amethocaine’ (tetracaine) and ‘lignocaine’ (lidocaine). The European Community therefore issued a directive in 1992, decreeing
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that in member countries the rINN should be used exclusive-
ly [11]. Despite harmonization on a European level, there are
also a number of United States Adopted Names that differ
from rINNs, such as ‘isoproterenol’ (INN: isoprenaline),
‘acetaminophen’ (paracetamol), or ‘meperidone’ (pethidine).

Nomenclatures and classifications

There is yet another characteristic of medical terminology,
one which tries to bring order to the chaos of synonyms,
eponyms, and acronyms. The precision of ‘medspeak’ is
greatly increased by the use of nomenclatures, such as the
WHO list of rINNs or the Paris Nomina Anatomica (PNA)
and its latest version, the International Nomina Anatomica
(INA), and classifications, such as the International
Classification of Diseases (ICD), mainly used for coding
diseases in hospitals and practices, or the Medical
Dictionary for Regulatory Activities (MedDRA). All of
these have one common purpose: to agree on a single term
for any one organ, disease, or treatment. For example, the
rules of the PNA were that each organ should have only
one term, the terms should derive from Latin, and eponyms
should be avoided [8].

Important as it may be for translators to get their terminol-
gy right–synonyms, eponyms, and acronyms are not
enough to produce a readable and meaningful text. There is
yet another aspect to translation–one that requires a curious
and questioning mind.

Part II: Beyond words

Medical phraseology

We have so far looked only at medical language on the
level of individual words. Yet medical jargon is full of
sequences of words and idioms which may sound unusual
in everyday speech. For example, most case reports open
with a standard sentence, such as “A 56-year-old white
man presented to the emergency department with a chief
complaint of nausea and vomiting.” The report may go on to
say that “His past medical history was significant for…” and
finally that “He was discharged home in good condition”.
Thus, a case report is strongly conventional in style [12].

The target language also has its conventions. For example,
“The postoperative course was uneventful” may be trans-
lated as Der postoperative Verlauf war unauffällig. You
would never think of translating ‘uneventful’ literally as
ereignislos. Convention determines which phrases are used
to describe a particular medical situation or procedure.

In contrast to case reports, which are similar in style and
form wherever Western medicine is taught [12], clinical
reports differ considerably when written by a doctor in
Germany or in the United States [13]. For example, the
cryptic phrase taken from an American ‘review of systems’
(Organanamnese), ‘Gen: Ø Hx: wt D/dizziness’, could be
translated as Allgemeines: Keine Vorgeschichte von
Gewichtsveränderungen oder Schwinkel. As this example
demonstrates, style patterns should not always be translat-
ed into the target language.

Convention may also determine whether the learned or the
standard term is used. For example, where English speaks
of ‘nausea and vomiting’, a combination of a Latin-based
and a common-speech term, German uses either the Latin-
Greek combination Nausea und Einesis or the common-
speech phrase Übelkeit und Erbrechen. To change or omit
these standard phrases is to fail to adhere to the conventions
of the target text, making it sound less professional and per-
haps even compromising its scientific credibility [14].

Terminology and phraseology
–enough to produce a
successful translation?

Translation requires more than exchanging terms or phras-
es in one language for another, adhering to the rules of
grammar, and choosing the appropriate register. Because
language is closely linked to subject-matter knowledge
[13], translators must know the subject they are addressing,
not only to successfully master translation problems, but
to, first of all, be aware of and identify potential pitfalls
[15], some of which have been highlighted above.

The text genres a medical translator is most likely to work
in include study protocols, clinical reports, package inserts,
biomedical articles, monographs, commercial brochures, and
patient education material. All of these genres differ in terms
of their function and purpose, their ‘whats’ and ‘whys’, their
audiences, and the expectations of these audiences [16]. The
translator must have a full understanding of both the source
and the target text, and of what the author intends to say and
what the recipient needs to hear. In this sense, every transla-
tion is a sort of interpretation [17], and even a seemingly
minor misinterpretation and mistranslation, e.g. in a package
insert, can have serious practical consequences.

An impressive example of how mistranslation can distort
what an author intends to say–and what the reader needs to
hear–is the English translation of the writings of Freud.
Bruno Bettelheim, in his book entitled ‘Freud and Man’s
Soul’, argues that “the English translations of Freud’s writ-
ings are seriously defective” and have led to mispercep-
tions about both Freud and psychoanalysis [18].

Considering that Freud himself stated that he considered
the cultural and human significance of psychoanalysis
more important than its medical one, why discuss this in
the context of medical translation? Because of thetransla-
tors’ preference for medical and learned terms over the
common-speech words Freud had used, psychoanalysis
came to be perceived, in the United States, as a medical
specialty instead of the humanistic undertaking that Freud
had had in mind.

Freud’s greatest concern was with man’s inner being, to
which he referred to as the ‘soul’ (Seele, from ‘psyche’
gr.). The purpose of his writings was to help his readers
understand themselves so they could act more rationally.
Language was an essential aspect of Freud’s work. He tried
to communicate his concepts in words which his readers
had used since their childhood, and he avoided technical
and Graeco-Latin terms whenever possible.
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His translators, Bettelheim contends, tended to replace words in ordinary use with medical terms and borrowings from Greek and Latin. One example of the translators’ preference for medical terms is the translation of Die Zerlegung der Psychischen Persönlichkeit. Bettelheim suggests a literal translation, such as ‘The Taking Apart of the Psychic Personality’. In English translation, this is rendered as ‘The Anatomy of the Mental Personality’. Nothing in the original suggests the translation Zerlegung as ‘anatomy’.

A particularly striking example is the way two of Freud’s most important concepts were translated into English. Freud divided the soul into the conscious, the preconscious, and the unconscious. To name these concepts, he chose the personal pronoun ich (‘I’), and to refer to the unconscious, he chose the pronoun es (‘it’). These personal pronouns were translated into English using their Latin equivalents—the ‘ego’ and the ‘id’, turning them into impersonal and technical speech. No word has more intimate connotations than the pronoun ‘I’. In contrast, ‘ego’ has the connotation of selfishness, such as in ‘ego trip’, which was not what Freud had in mind.

A major shortcoming of the English translations is that they eliminate any mention of the ‘soul’, which is substituted with ‘mind’ throughout the translation. As we have seen, for Freud the mind (Ich, or ‘I’) is only one of three aspects of our soul, the other two being the preconscious (Über-ich, or ‘above-I’) and the unconscious (Es, or ‘it’). Therefore, what Freud referred to as the soul, the translators reduced entirely to the conscious aspect of the mind, the ‘I’.

Freud describes a number of errors we sometimes make in everyday life when our unconscious plays tricks on us, and he calls these Fehlleistungen. This term combines two well-known German nouns: Leistung means accomplishment, and Fehler indicates failure. Thus, the word Fehlleistung combines an achievement and a mistake. For example, when we produce a Freudian slip of the tongue, we might feel that we said what we wanted to say, but we also know it was the wrong thing to say. One possible rendering of Fehlleistung, Bettelheim suggests, is ‘faulty achievement’. In English, Fehlleistung is translated as ‘parapraxis’, a word drawn from Greek. In German, we might readily say, ‘This was a Fehlleistung’, whereas the word ‘parapraxis’ sounds like something that is far removed from our own personal experience.

Let me mention one more example amongst many others. What Freud referred to as Schaulust—a pleasure in watching something—may be difficult to translate, but a phrase such as ‘lust in looking’ would make his meaning clear. The word used by Freud’s translators—‘scopophilia’—does not.

Overall, the English translation of Freud changed his message in significant ways. By making ample use of abstrac-