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Abbreviations in English medical terminology and their adaptation to Croatian

ABSTRACT

The research presents results of classifications and analyses of alphabethisms, acronyms and their hybrid forms on a limited corpus of the English medical terms. Alphabethisms and acronyms were classified according to two criteria: narrower and broader sense, and their differences in orthographic formation were described by a set of specific descriptors. This kind of description, classification and analysis was used in examining the corpus of both English and Croatian medical terms. In the analysis of orthographic adaptation of English alphabethisms to Croatian, three degrees of their adaptation were suggested: zero orthographic change, partial/compromise adaptation and complete adaptation. Substitution and adaptation on the orthographic level is tentatively named transgraphemization.

Key words: English, alphabethisms, acronyms, medicine, descriptors, adaptation, Croatian, transgraphemization, zero orthographic change, partial and complete adaptation

1. Introduction

The English language has witnessed a prominent increase in the number of abbreviations used in the past several decades. This applies to both general language and specialized jargons of various professions, such as the medical profession, from which the basis of this work is taken. The authors, such as Cannon, note that the abbreviations have been used for thousands of years, ever since the Sumerian times

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(1989: 29). However, the process of their creation has long been neglected as they do not belong to regular morphemic processes (Fandrych 2008a: 71). Although Lehrer (2007) and Cannon (1989) provide some examples of abbreviations in English language from 16th century on, the first significant increase in usage of abbreviations in the English language was recorded in the mid 20th century during the World War II, through appearance of new weaponry, military technologies and government organizations (Cannon 1989: 101). At that point, the technological advance brought new military terms and their respective abbreviations. A similar situation can be seen in the field of medical terminology in which new treatments, diagnostics and diseases are discovered every day, which causes new terms to arise, and consequently, new abbreviations (Gjuran-Coha and Bosnar-Valković 2008: 1-2). Works, such as those of Fandrych (2007) and Bieswanger (2007), show that the usage abbreviations is not reserved exclusively for the formal register; instead, they are equally used in both highly specialized technical jargon and informal types of internet or mobile phone communication, denoted as “Netspeak” and “Textspeak” (Crystal 2004).

2. The problems with classification

One of the defining traits of this word formation group is the lack of consistent categorisation and typology, and fixed boundaries between the respective types of abbreviations. López Rúa (2004: 110) states that there are numerous disagreements over what an acronym in general is and what proper abbreviations, clippings and blends are (Ibid., 110). A plausible explanation for this is provided by Cannon who states that some of the first attempts of classification in this field only brought more confusion as many of the classifications were false and contradictory (1989: 106). One of the examples of this are the Gale dictionaries which elicit some textbook examples of blends like *motel*, *brunch* and *smog* as acronyms not blends (Crowley and Sheppard 1987, Sheppard and Towell, 1987). Similar examples of incorrect classifications can be found in Fischer’s work as well (1998: 28).

Another discrepancy within this field is the lack of consistent usage of a certain term for certain abbreviation type. Among the authors cited in this work, there is a great disagreement over what the terms initialism, alphabetism and acronym represent and what they should be used for (cf. Plag 2003, Algeo 1991, Jackson and Zé Amvela 2005, Fandrych 2008a & b, Stockwell and Minkova 2001, Harley 2006, López Rúa 2006, Cannon 1989, Crystal 1995). Similar discrepancies regarding the differentiation between clippings, blends and clipped compounds may be seen when comparing Fandrych (2008), Plag (2001), and Algeo (1991).

3. The classification of abbreviations in the research

3.1. The taxonomy of abbreviations

The classification of abbreviations used in this work largely relies on López Rúa's (2006) work. According to her, abbreviations are divided into simple and complex abbreviations, with the former encompassing only proper abbreviations, such as *Mr.*, *prof.* and *dr.*, which appear in the written medium only. The latter subcategory, complex abbreviations, includes blends, clippings and initialisms, which are further divided into alphabetisms and acronyms. Complex abbreviations appear in both written and spoken medium, but certain works, such as Crystal (2001), Fandrych (2007), and Bieswanger (2007) mention the electronic medium, abundant in complex abbreviations, as the third medium.

According to López Rúa, an initialism is “[...] the result of selecting the initial letter, or occasionally the first two letters, of the orthographic words in a phrase and combining them to form a new sequence” (2006: 677). The pronunciation of initialisms depends on various linguistic factors, but there are two main modes of their pronunciation – as a word (prototypical acronyms), and as a series of letter names (prototypical alphabetisms) (Ibid., 677). There are some abbreviations which can be pronounced both ways (*VAT/Vat* < ‘Value Added Tax’), and some hybrid abbreviations that are pronounced as a combination of the two ways (*CD-ROM* < ‘compact disc read-only memory’). However, they are far less frequent (Ibid., 677).

Clippings are abbreviations created through a “[...] process by which a word-form of usually three or more syllables is shortened without a change in meaning or functions” (Ibid., 676). Although clippings express informal connotations and familiarity (Plag 2003) or even serve as euphemisms (Fandrych 2008b), which ultimately leads to different stylistic properties of the word, the meaning more or less remains intact. Despite this, there are some examples of clippings completely replacing their source phrases (*bus* < *omnibus*).

The morphological and phonetic properties of blends, the last type of complex abbreviations covered, are a topic of numerous works (e.g. Gries 2004a & 2004b, Lehrer 2007, Crystal 2001, Fandrych 2007, 2008a & 2008b, López Rúa 2006 & 2007, Cannon 1989, Plag 2003). While there are numerous definitions of the term, López Rúa's definition was chosen for the purpose of this work, as her explanation is deemed sufficiently complex for this type of analysis. She states that that the blends are created by “[...] joining two or more word-forms through simple concatenation or overlap and then shortening at least one of them” (2006: 677).

We find this taxonomy appropriate as it clearly distinguishes certain abbreviation types, that is, it does not provide the same name for certain superordinate and subordinate terms as it is the case in some works. This in particular refers to the terms for initialisms, alphabetisms and acronyms, which are often used interchangeably or wrongly dubbed abbreviations or shortenings (e.g. in Plag 2003, Jackson and Zé Amvela 2005). Another argument for this usage of terms are the descriptive feature of each abbreviation subcategory. The term initialism denotes an abbreviation created through usage of initial letters, which applies to both alphabetisms and acronyms. The term alphabetism denotes an abbreviation pronounced as a series of letters of the alphabet, i.e. letter-by-letter, while the term acronym, coined in 1943, has been generally accepted to denote abbreviations pronounced as whole words.

3.2. The processes underlying the creation of abbreviations

Following Fandrych (2008), the abbreviations are created through a process known as the “submorphemic” or “non-morphemic word formation”. This implies that the word-forming processes responsible for the creation of all abbreviation types use elements smaller than morphemes – *splinters* for blends and clippings and *initials* for initialisms. Adams (1971) perceives splinters as irregular parts of morphs, while Lehrer (2007) regards them as clippings which cannot occur alone but in combination with another splinter or word. However, as the latter explanation clearly excludes clippings from splinter-related processes, one should distinguish between the “bound splinters” used for blends and “free splinters” used for clippings.

The term initial stems from Cannon’s work (1989) and it denotes the initial letters/phonemes of source phrases used in the creation of initialisms. López Rúa (2004 & 2006) adds that the letters used for the creation of initialisms are not always necessarily the initial ones (2004: 125), and that sometimes initialisms take first letters of compound constituents, such as *ECG* < ‘electrocardiogram’ (2006: 677).

Although the previous instances of abbreviations were motivated by creativity and originality, recent works indicate that contemporary initialisms are increasingly motivated by language economy rather than jocular intent or creativity (Cannon 1989). However, certain initialisms still exhibit playful character through homonymy, homophony and humorous re-interpretation of existing words and abbreviations (Fandrych 2008b: 111-112). On the other hand, blends and clippings have retained the creative tendencies and are used in numerous ways to capture the attention of the reader (Lehrer 2007: 128). The abbreviations in our corpus, predominantly alphabetisms, are motivated by language economy, although several instances of hybrid abbreviations are homonymous and homophonous with existing words, e.g. *NOESY* which is an obvious re-interpretation of the word *noisy*.

4. The corpus and its sources

The abbreviations analysed in this work are taken from two Croatian medical journals – *Acta Pharmaceutica* (12 issues; from 2004 to 2011) and *Gynaecologia et Perinatologia* (6 issues; from 2009 to 2011). Tanay's dictionary, *Hrvatsko-engleski, englesko-hrvatski rječnik medicinskoga nazivlja s izgovorom* was used to provide additional information. The authors would like to thank Mihaela Oros Čačić, M.D. for her sincere and ardent help on pronunciation of adapted English medical terms in the Croatian medical terminology.

The abbreviations belong to nine lexical fields of medical lexicon shown below and are marked in the Appendix by numbers from 1 to 9 shown in the parentheses for each lexical field:

- diseases, disorders, symptoms and syndromes (1),
- research and treatment methods (2),
- models (mathematic, computer, measurement) (3),
- chemistry and pharmacology (4),
- associations, organisations, centres and institutes (5),
- classification systems, parameters, variables and technologies (6),
- body matter, hormones (7),
- parts of the body (8), and
- bodily functions (9).

The most abbreviations belong to the field of research and treatment methods with 59 abbreviations, classification systems, parameters, variables and technologies with 40 abbreviations, and chemistry and pharmacology with 34 abbreviations.

The corpus comprises 208 abbreviations, all belonging to the category of initialisms. There are 177 alphabetisms, 21 acronym and 10 hybrid abbreviations. The analysis examines the orthographic elements used in the formation of initialisms, such as initials, prefixes, numerals and syllables, and various types of orthographic changes that the elements of abbreviation undergo, such as metathesis, ellipsis, conversion and addition.

Our corpus, given in the Appendix, provides the additional information for each abbreviation in the following order: source phrase, descriptor of symbol usage, abbreviation type and length, source phrase length, orthographic change and its details and semantic field. The information given in the Appendix are provided in order to substantiate the subclassification of abbreviations into abbreviations in broader and narrower sense. When comparing the abbreviation length and the number of source phrase constituents, a discrepancy between the two was noticed for some abbrevia-

tions, for example CDC ‘Centre for Disease Control and Prevention’, EBGO ‘European Board of Obstetrics and Gynecology’ and IARC ‘International Agency for Research of Cancer’, which is why the abbreviations in narrower sense are distinguished from those in broader sense. The abbreviations in narrower sense are those which have 1 symbol per 1 source phrase constituent, whereas abbreviations in broader sense do not adhere to these rules, which results in mentioned orthographic changes.

5. Alphabetisms, acronyms and hybrid forms in narrower and broader sense

For the purposes of our research, alphabetisms and acronyms in English medical terminology will be classified according to two criteria: broader and narrower sense. The narrower sense of understanding the formation of alphabetisms and acronyms refers to those that are formed according to their orthographic norms, i.e. “[...] using the initial letters of the words of an expression, pronounced by the alphabetical names of the letters [...]” (Algeo 1993: 9). The broader sense is understood as the ways and processes of their formation, more or less different from the orthographic norms, in consequence of which, one or more initials for various smaller elements of the source phrase (smaller than words), are used. Due to this, initials for final graphemes, compounds, affixes, grammatical and lexical words, as well as different orthographic changes, such as ellipsis, conversion, metathesis and addition, are being analysed and classified.

The analysis has further shown the possibility of their subclassification according to the above mentioned characteristics. For the purposes of the study, a set of additional alphabetisms was introduced, which provides a better and transparent description and classification of terms. The initials in our set of descriptors describe elements of both alphabetisms and acronyms in the medical terminology, in narrower and broader sense. The set of descriptors might also be used as an efficient lexicographic tool used for description of different characteristics of non-morphemic word-forms.

Generally speaking, initials of descriptors are of two kinds – those representing capital and those representing small letters, i.e. *L* is used for initials in an alphabetism formed of capital letters, and *l* for those formed of small letters. All other initials describe their final realizations with different orthographic or morphological characteristics, e.g. *P* refers to an initial representing affixes (mostly prefixes) from source phrases, *N* stands for a numeral, *S* refers to a syllable, and *W* stands for a word from a source phrase transferred as a whole in an abbreviation. Compared with the combination of describing initials *Ll*, an underlined descriptor, *Ll*, stands for those which

present the first two or any other graphemes of the source phrase lexeme. Orthographic changes, evident by comparing alphabetisms or acronyms with their source phrases, are explained by the following initials: *E* for ellipsis, *C* – conversion, *M* – metathesis, and *A* for addition of a word or a diacritic sign not found normally in source phrases. Thus, we got combinations of initials representing different realizations of alphabetisms, i.e. descriptors, e.g. *LLL*, *lll*, *NLL*, *PLL*, *SLL* etc.

Our classification and further subclassification of alphabetisms and acronyms in narrower and broader sense is shown in the following table. Descriptors used in the table present all realizations of the analysed medical terminology. Numerals in brackets show a total number of alphabetisms, acronyms and their hybrid forms.

ALPHABETISMS		ACRONYMS		HYBRIDS (alph.+acr.)	
in narrower sense	in broader sense	in narrower sense	in broader sense	in narrower sense	in broader sense
LLL (124)	LLL E (24)	LLL (10)	LLL E (4)	LLL (2)	LLL E (2)
			LLL E, M (1)		LLL E, A, M (1)
	L LL (1)				
	L LL E (2)				
	PLL (9)		PLL (1)		PLL (2)
	PLL E (1)				
					P <u>ll</u> E, A (1)
	PPL (2)		PPL (2)		PPL (1)
	PPL E (2)				
	LlL (1)				
	<u>ll</u> L (1)				<u>ll</u> L (1)
	<u>ll</u> L E (1)				
	L-LL (2)				
	L-LL E, A (1)				L-LW (1)
	L/LL (1)				
	l/l E, A (2)				
	NLL E, A, C (2)				
	N-LL (1)				
			SLL (1)		
	SLL E (1)				
	SSL E (1)				

Classification and description of the corpus starts with alphabetisms, and is followed by the analysis of acronyms and hybrid forms. Each class of these formations is then subdivided according to two criteria: criterion of narrower and broader sense.

5.1. Alphabetisms in narrower sense

Classification of alphabetisms in narrower sense starts with those formed of initials written with capital letters and taken from every single element (lexemes) in source phrases, i.e. one initial representing one lexeme in a source phrase. This class of alphabetisms is the most abundant in our research. The descriptor representing such alphabetisms is the one worded as *LLL*.¹

TYPE: LLL	
ALPHABETISM	SOURCE PHRASES
AD	A lzheimer's D isease ¹
BCS	B iopharmaceutical C lassification S ystem
CDRI	C entral D rug R esearch I nstitute
LMPSA	L ow M elting P oint S ugar A lcohol

Sometimes, an alphabetism might be formed of initials and individual letter(s) found in source phrases, e.g.

TYPE: LLL	
ALPHABETISM	SOURCE PHRASES
ENGBSS	E arly N eonatal G roup B S treptococcal S epticemia

Those abbreviations formed of initials from compounds in source phrases are also directly connected to the group of alphabetisms in narrower sense, e.g.:

TYPE: LLL	
ALPHABETISM	SOURCE PHRASES
BBB	B lood- B rain B arrier
HMBC	H eteronuclear M ultiple- B ond C orrelation
SEDDS	S elf- E mulsifying D rug D elivery S ystems

¹ For the purpose of a more transparent presentation and explanation of alphabetisms and acronyms in our study, we decided to present all initials in source phrases, used either in alphabetisms, acronyms or hybrid forms, with capital letters. This means that lexemes in original source phrases might have either been written with capital or small letters.

5.2. Alphanisms in broader sense

When comparing alphanisms classified according to the criteria of narrower and broader sense and studying the analogy between alphanisms and their source phrases, we shall find that the alphanisms in broader sense are to be classified differently. Their most distinguishing features can most clearly be seen in the ways of their formation. Among the most notable ones are those of ellipsis of either grammatical or lexical words (or sometimes both) and the conditioned or unconditioned use of blankness between initials in alphanisms. Conditioned blankness refers to those cases in which changes were caused by ellipsis in alphanisms while the unconditioned blankness in the orthography of alphanisms is taken as it is, i.e. there were no changes involved in their final orthographic form. The blankness between the elements of alphanisms is also recognized in the descriptor by a space between the first and the second initial, i.e. *L LL*.

5.2.1. Ellipsis

Ellipsis can be of three kinds: either a lexical or grammatical word is omitted, or both lexical and grammatical words are omitted from alphanisms, e.g. in *ASA*, the preposition 'of' was omitted, in *CDCC*, the adjective 'targeted' was omitted, and in *CDC* the preposition 'for', the conjunction 'and', and the noun 'prevention' were omitted.

TYPE: LLL E	
ALPHABETISM	SOURCE PHRASES
ASA	American Society of Anesthesiologists
CDDS	Colon targeted Drug Delivery Systems
CDC	Centre for Disease Control and prevention

5.2.2. Blankness between initials

Alphanisms with blankness between initials are of two kinds: those with the conditioned and those with the unconditioned blankness between initials. In *FT NMR*, when compared with its source phrase, the blankness between *FT* and *NMR* was not conditioned by any additional change, while in *C NMR* we can trace the changes conditioned by the ellipsis in the source phrase, which means that both a numeral and a hyphen were omitted.

TYPE: L LL; L LL E	
ALPHABETISM	SOURCE PHRASES
FT NMR	F ourier T ransform N uclear M agnetic R esonance
C NMR	C arbon-13 N uclear M agnetic R esonance
H NMR	H ydrogen-1 N uclear M agnetic R esonance

5.2.3. Affixes

Alphabetisms with a combination of initials referring to lexical morphemes and affixes in source phrases are generally of two kinds: the first belongs to the group of alphabetisms with only one initial for an affix and the second refers to those with more than one initial for affixes. These initials represent abbreviated prefixes, such as: *pre-*, *peri-*, *infra-*, *multi-*, *intra-*, *anti-*, *poly-*, *micro-* and *non-*. Number of initials in alphabetisms can range from two up to five.

TYPE: PLL	
ALPHABETISM	SOURCE PHRASES
PE	P re E clampsia
PNM	P eri N atal M ortality
FTIR	F ourier T ransform I nfra R ed
MFPR	M ulti F etal P regnancy R eduction

Features which make our analysis more interesting are those found in alphabetisms with initials taken from the combining forms. Due to the fact that combining forms have a very similar function in formation of words to that of prefixes, we grouped them under the class of *PLL* or *PPL*, i.e. the class of one or more initials for prefixes. The following combining forms were found in the analysed material: *immuno-*, *gastro-*, *neuro-*, *deoxy-*, *ribo-*, *electro-*, *chemo-*, *amino-*, *morpho-*, *thermo-*. Some of them, like *immuno-* and *gamma-*, are also used in formation of acronyms, but they will be discussed later. The following table presents examples of alphabetisms formed from initials referring to lexical words and one initial for a combining form.

TYPE: PLL	
ALPHABETISM	SOURCE PHRASES
GIT	G astro I ntestinal T ract
NFT	N euro F ibrillary T angles
TGA ²	T hermo G ravimetric A nalysis
GRDDS	G astro R etentive D rug D elivery S ystems

Alphabetisms with more than one initial for prefixes are also rare. There is only one example with prefixes *micro-* and *poly-*: *MNPCE* < *MicroNucleated PolyChromatic Erythrocyte*.²

There are cases in which, along with the abbreviated lexical words and combining forms, other combining forms are being omitted. This is the case with *DNA* (< *DeoxyriboNucleic Acid*) in which a combining form *-ribo-* (< *ribose*) was omitted.

As it was mentioned earlier, some of the alphabetisms take more than one initial for the combining forms in source phrases. This is the case with alphabetisms *ECT* and *MNPCE*.

The example of *PMN* shows the possibility of abbreviating the expression with a combination of ways. Namely, this example presents the case of abbreviating a prefix, a combining form and, at the same time, omitting a lexical word.

TYPE: PPL; PPL E	
ALPHABETISM	SOURCE PHRASES
ECT	E lectro C hemo T herapy
MNPCE	M icro N ucleated P oly C hromatic E rythrocyte
PMN	P oly M orpho N uclear <i>leukocyte</i>

5.2.4. Use of small letters in alphabetisms

Although small letters in medical alphabetisms are extremely rare, we find them important enough to make their own subgroup of alphabetisms in broader sense. They can be of several kinds. In *QbD* a grammatical word was abbreviated with a small letter, in *PlGF* – the first two graphemes of the first word were taken, and in *PhR-MA* a combination of ways is used in its formation, i.e. first two graphemes of the

² It should be added that *TGA* alphabetism can also be described by the LLL descriptor, because its source phrase is sometimes worded as *Thermal Gravimetric Analysis*.

first word were taken to form two initials (one with a capital letter and the other with a small letter), lexical words were abbreviated in a regular way and grammatical words (*and* and *of*) were omitted. As it was explained earlier, the descriptors for this kind of alphabetisms contain a small letter <l> representing a lexeme abbreviated in such a manner. Those with first two graphemes, representing first two initials, are described with a capital and a small letter <l>, both underlined – LL.

TYPE: <u>LL</u>; <u>LL</u>; <u>LL</u> E	
ALPHABETISM	SOURCE PHRASES
QbD	Quality by Design
PIGF	Placental Growth Factor
PhRMA	Pharmaceutical Research <i>and</i> Manufacturers of America

5.2.5. Use of hyphens and slant lines in alphabetisms

Hyphens and slant lines in alphabetisms are also rare. There are only few examples with the mentioned diacritic signs. However, they can be divided into several subgroups according to their formation. In the first subgroup there are alphabetisms which retained a hyphen or a slant line in the same position as it was used in the source phrase, and in the second are those in which some hyphens or slant lines from the source phrase were omitted (ellipsis), and some new one sin alphabetisms were added. For this reason we introduced *addition* as a term for this orthographic change.

TYPE: L-LL; L-LL E, A	
ALPHABETISM	SOURCE PHRASES
LC-MS	Liquid Chromatography-Mass Spectrometry
GC-MS	Gas Chromatography-Mass Spectrometry
RP-HPLC	Reversed-Phase High-Performance Liquid Chromatography

Another subgroup reveals a possibility of using both slant lines and small letters in abbreviating a compound, as well as omitting the hyphens and grammatical words used in source phrases.

TYPE: L/LL; I/I/ E, A	
ALPHABETISM	SOURCE PHRASES
GC/MS	Gas Chromatography/Mass Spectrometry
s/o/w	solid-in-oil-in-water
w/o/w	water-in-oil-in-water

5.2.6. Use of numerals in alphabetisms

So far we have noted various ways of alphabetism formation in medical terminology, and yet, another infrequent modality of formation justifies the necessity for a more detailed orthographic analysis. Alphabetisms with numerals, which make this small subgroup, are subdivided into two groups. The first group (*N-LL*) refers to those formed by taking initials of every element of the source phrase and transferring a diacritic sign and a numeral, e.g. *HSV-1* < *Herpes Simplex Virus-1*.

The second group of alphabetisms refers to those formed by taking initials for each lexical element of the source phrase, omitting some lexemes (ellipsis), converting lexemes (conversion) into numerals, and adding diacritic signs (addition) otherwise not found in source phrases.

TYPE: N-LL E, A, C	
ALPHABETISM	SOURCE PHRASES
LD50	<i>mean</i> Lethal Dose
2D-NMR	<i>two-</i> Dimensional Nuclear Magnetic Resonance

5.3. Acronyms in narrower sense

Acronyms in our research are not numerous, but still, their formational patterns, when compared to those of alphabetisms, give us enough evidence for a systematic classification of these non-morphemic word-formation types in English medical terminology. The concept of acronyms has been clarified many times before. For our purposes, we shall refer to the concepts of acronyms found in works of Fandrych (2008a: 72) and Cannon (1989: 108). Acronyms, according to Fandrych, are formed from the initial letters of phrases with omission of function words and represent words. They are intentionally formed and are homonymous with the existing words. Sometimes they can even incorporate numbers and symbols. In Cannon's work we find that acronyms come from a source of at least three constituents. Furthermore, Fandrych (2008b: 111) states that in some exceptions not all the initials

of source phrases are used in formation of acronyms and that occasionally, additional letters or syllables are used, or even the ordering of the initials can be changed.

On the basis of these concepts we classified the acronyms into two broad categories: those in narrower and broader sense. As with the alphabetisms in narrower sense, the acronyms in this sense are formed of initials taken from every word in a phrase. The descriptor for this kind of acronyms is again *LLL*.

TYPE: LLL	
ACRONYM	SOURCE PHRASES
END	E arly N eonatal D eath
FID	F lame I onization D etector
HAPO	H yperglycemia A dverse P regnancy O utcome
SMILES	S implified M olecular I nput L ine E ntry S ystem

The next point concerns the possibility of taking initials from function words as well. This is the case of *GRAS* in which the grapheme <a> from *as* was also used (<*Generally Regarded As Safe*>).

5.3.1. Acronyms in broader sense

In this subgroup of acronyms, we find different ways of their formation. They can be formed by taking either an initial or a final letter of a source phrase constituent, by taking initials of each compound constituent, by omitting a lexical or grammatical word from a phrase (ellipsis), using initials of affixes and combining forms, by changing the order of initials to that of a source phrase (metathesis) or using groups of graphemes and syllables.

The first example for this subgroup would be an acronym which is formed by both initials and final letters of a source phrase. In *NOESY*, which by its pronunciation and partly by its orthography reminds us of the adjective ‘noisy’, first three initials refer to first three constituents while the last two refer to an initial and a final letter of the last constituent (< *Nuclear Overhauser Effect SpectroscopY*>).

The example of *DIAP* represents the possibility of using both initials of compound constituents and other lexemes in the formation of acronyms. Thus we have three initials from a compound and one from a free root morpheme, i.e. *DIAP* < *Drug-In-Adhesive Patch*>.

5.3.2. Ellipsis

Ellipsis can be of two kinds: either a grammatical word or both lexical and grammatical are omitted from acronyms. In *FRAP* a grammatical word (*of*) was omitted and in *HELLP* a grammatical word (*and*) and a plural form of a lexical word (*enzymes*) were omitted.

TYPE: LLL E	
ACRONYM	SOURCE PHRASES
FRAP	F erric R educing A bility <i>of</i> P lasma
HELLP	H emolysis E levated L iver <i>enzymes and</i> L ow P latelets

5.3.3. Affixes

Acronyms with a combination of initials referring to lexical morphemes and affixes in source phrases are classified in one group only – the group of acronyms with only an initial for an affix and/or an initial for a combining form. As with the abbreviated affixes in alphabetisms (see 3.2.3), a similar situation is found in the class of acronyms, although with far less examples. This similarity is seen in the possibility of abbreviating both affixes and combining forms in acronyms. In the case of *PLL* and *PPL* for acronyms, there is only one affix – *anti-*, and several combining forms, i.e. *gamma-*, *immuno-* and *amino-*.

TYPE: PLL, PPL	
ACRONYM	SOURCE PHRASES
LASPP	L iquid A nti S olvent P recipitation P rocess
ELISA	E nzyme- L inked I mmuno S orbent A ssay
GABA	G amma- A mino B utryc A cid

The above examples give evidence of some other formational characteristics of acronyms as well. Along with the initials of affixes and combining forms used in their formation, there are also those which represent the elements of compounds, e.g. *Enzyme-Linked* > *ELISA* or *Gamma-AminoButryc Acid* > *GABA*.

5.3.4. *Metathesis*

Metathesis is found in only one acronym of our corpus. In *EBGO*, which was abbreviated from the source phrase *European Board of Obstetrics and Gynecology*, the order of two final initials was modified. Thus, instead of **EBOG* the resultant acronym is *EBGO*.

TYPE: LLL E, M		
ACRONYM	metathesis	SOURCE PHRASE
EBGO		E uropean B oard <i>of</i> O bstetrics <i>and</i> G ynecology

Along with the metathesis, *EBGO* underwent one more modification, which is the ellipsis of grammatical words *of* and *and*.

Finally, there is one more point we would like to touch upon in classification and description of acronyms. It is the process of abbreviating whole syllables in a resultant acronym.

5.3.5. *Use of syllables in acronyms*

There are only three examples of acronyms with abbreviated syllables in our corpus. They can be classified into three subcategories. The first subcategory refers to an acronym made of a syllable and initials for the initial and final graphemes. Such is the case of *TOCSY* in which the syllable *to* from *total* was abbreviated together with the initial graphemes <C>, <S> and the final grapheme <Y>. The descriptor used for this category of acronyms is *SLL*.

TYPE: SLL	
ACRONYM	SOURCE PHRASES
TOCSY	T Otal C orrelation S pectroscop Y

The second subcategory refers to an acronym in which, together with previously mentioned characteristics, the ellipsis of a grammatical word is used. In *OBSQID*, the syllable *obs/* from *obstetrical* is abbreviated, along with the initials <Q>, <I>, <D>. The grammatical word *and* was omitted.

TYPE: SLL E	
ACRONYM	SOURCE PHRASES
OBSQID	O BStetrical Q uality I ndicators <i>and</i> D ata

The last third subcategory deals with an acronym in which more syllables were abbreviated and both lexical and grammatical words were omitted. In *PATRICIA*, the syllable *pa/* from the compound *papilloma-virus*, the syllable *tri/* from *trial*, the grammatical word *against* and the lexical word *young* were omitted. Interestingly, this acronym exemplifies a possibility of taking an initial grapheme from a grammatical word as well (<i> from *in*). This subcategory is described with the *SSL* descriptor.

TYPE: SSL E	
ACRONYM	SOURCE PHRASES
PATRICIA	PA pilloma-virus TRIA l <i>against</i> C ancer I n <i>young</i> A dults

5.4. Hybrid forms

The classification of hybrid forms, i.e. forms made by combining alphabetisms and acronyms, is also divided according to two criteria, narrower and broader sense. The resultant abbreviated forms are partially pronounced as alphabetisms and partially as acronyms.

5.4.1. Hybrids in narrower sense

Those belonging to the group classified according to the criterion of narrower sense (*LLL*) are formed by abbreviating initials of components from source phrases and are partially pronounced as acronyms. Our examples show that an acronym can either be in the initial or the final position of an abbreviation.³

TYPE: LLL	
HYBRID FORMS	SOURCE PHRASES
VEGF [⌈εδZ∇εϕ]	V ascular E ndothelial G rowth F actor
PPROM [∇πι:πρΟμ]	P reterm P remature R upture O f ³ M embranes

5.4.2. Hybrids in broader sense

The hybrids belonging to the subgroup of abbreviations formed according to the criterion of broader sense, can be divided into groups with changes described by the following descriptors: *LLL E*; *PLL*; *PLL A*; *PPL*; *LL*; *LLL E, A, M*; *L-LW*. There are abbreviations formed by omitting some of the elements from a source phrase, those formed by abbreviating affixes or combining forms, those having adopted the first

³ As in the previous example of the acronym *PATRICIA*, the hybrid form *PPROM* exemplifies a possibility of taking an initial grapheme from a grammatical word too.

two initial graphemes (both a capital and a small letter) from a source phrase element, hybrids with the changed position of initials and with elliptical form, when compared to the order of initials in source phrases, and those with added initials. The last descriptor of *L-LW* describes a special and rare kind of hybrid forms in which a whole lexeme was transferred to the abbreviation.

In the group of *LLL E*, abbreviations are formed with the ellipsis of grammatical words in source phrases (*for, of, and, on, the*) and a combination of alphabetisms and acronyms. There can be one or even more initials in the part of alphabetisms.

TYPE: LLL E	
HYBRID FORMS	SOURCE PHRASES
IARC [αI∇α:κ]	I nternational A gency <i>for</i> R esearch <i>of</i> C ancer
CPCSEA [σI:πI:σI:∇σI:]	C ommittee <i>for the</i> P urpose <i>of</i> C ontrol <i>and</i> S upervision <i>of</i> E xperiments <i>on</i> A nimals

In the groups of *PLL* and *PPL*, abbreviations are formed with the initials for prefixes or combining forms (*thio-, ultra-, non-, anti-*) which form the part of an alphabetism in a hybrid, with initials for compounds, with a simultaneous ellipsis and addition of a diacritic sign (a hyphen and a slant line). The abbreviation for *Nonsteroidal Anti-Inflammatory Drug* can have a variation as well, but then, it will be classified to a different subgroup of hybrid forms, namely to *PPL*, as it has more than one affix abbreviated. In the group of *PLI E, A*, hybrids are made by abbreviating the initials of a prefix, by abbreviating first two or any other graphemes of a lexeme from a source phrase, and by omitting and adding a diacritic sign (omission of a hyphen and addition of a slant line).

TYPE: PLL; PPL; PLI E, A	
HYBRID FORMS	SOURCE PHRASES
NAID [∇ενεIδ]	N onsteroidal A nti- I nflammatory D rug
TBARS [∇τI:βα:ζ]	T hio B arbituric A cid R eactive S ubstances
NSAID [∇εν∇εσ∇εIδ]	N on S teroidal A nti- I nflammatory D rug
UV/VIS [∇φυ:∇ωI:∇ωIζ]	U ltra V iolet- V isible S pectroscopy

A different case of abbreviating more than one grapheme from a lexeme is seen in *MMcC* hybrid, which was abbreviated from the phrase *Minimal MiCrobicidal Concentration* and is pronounced as [∇εμ%μ{κ∇σI:}. Its difference is understood in the way graphemes were abbreviated, i.e. the first and the third grapheme from ‘mi-

crobicidal' were abbreviated and used to make a morpheme *Mc* (< *Mac*), used in formation of surnames. Due to the resultant combination of graphemes, which together with the following initial <C> make the acronym *McC*, the hybrid is described by the descriptor *LLL*.

Metathesis is found in only one hybrid form. In *E-EBGO* [$\forall t: \forall \varepsilon \beta \gamma \cong Y$], which was abbreviated from the source phrase *Extended European Board of Obstetrics and Gynecology*, the order of two final initials, <O> and <G>, was changed (the same can be seen in the acronym *EBGO*, see 5.3.4.). Along with the metathesis, *EBGO* underwent some additional modifications, and those were the ellipsis of grammatical words *of* and *and*, and the addition of a hyphen in the hybrid form of the abbreviation.

The last is the case of a different hybrid form, different from those composed of alphabethisms and acronyms. It is the hybrid composed of the alphabethism *EGF* and a word *dextran*, joined by a hyphen (*EGF-dextran* < *Epidermal Growth Factor-dextran*). The reason for such a formation is not evident from the comparison with other examples of word formation in our corpus. Our only explanation for this kind of word form is that in this way it can be easily isolated from a similar one, i.e. *EGF*. This hybrid form is described by the descriptor *L-LW*⁴.

5.5. Classification of Croatian medical alphabethisms and acronyms

Although the classification of Croatian medical alphabethisms and acronyms is not the aim of this research, it seemed necessary to see if our concept of classification in the formation of alphabethisms and acronyms can be applied to the word-formation classification of Croatian medical abbreviations. The material which has been assembled from the available sources gives us considerable evidence that the descriptors can also be applied to its classification.

The *LLL* descriptor classifies those alphabethisms (in narrower sense) formed of initials written with capital letters and taken from every single element (lexemes) in source phrases, such as: *JINT* < *Jedinica Intenzivne Neonatalne Terapije*, 'intensive neonatal therapy unit'; *JINNJ* < *Jedinica Intenzivne Neonatalne Njege*, 'intensive neonatal care unit'; *INPT* < *Izrazito Niska Porodna Težina*, 'extremely low birth weight'; *VNPT* < *Vrlo Niska Porodna Težina*, 'very low birth weight'; *RNM* < *Rani*

⁴ A similar hybrid form to the formational characteristics of *EGF-dextran*, is a neologism which has recently been coined and is periodically used in Croatian media (either in its written or pronounced form). This is the case of *PPVRH Čačić* (< *Prvi Potpredsjednik Vlade Republike Hrvatske* /Radimir/ Čačić; 'the first Vice-premier of the Croatian Government /Radimir/ Čačić'). The neologism was formed from the alphabethism *PP*, the acronym *VRH* and with the addition of the proper noun *Čačić*.

Neonatalni Mortalitet, ‘early neonatal mortality’; *NU* < *Neonatalna Ustanova*, ‘neonatal institution’; *MKB* < *Međunarodna Klasifikacija Bolesti*, ‘international classification of diseases’; *PT* < *Porodna Težina*, ‘birth weight’; *KNM* < *Kasni Neonatalni Mortalitet*, ‘late neonatal mortality’; *CIGN* < *Cervikalna Intraepitelna Glanduralna Neoplazija*. The *PLL* and *PPL* descriptors (alphabethisms in broader sense) can be applied to those with initials representing abbreviated prefixes or combining forms, e.g. *PNU* < *PeriNatalno Umrli*, ‘perinatally dead’; *NSAR* < *NeStereoidni AntiReumatik*, ‘nonsteroidal anti-inflammatory drug’⁵, *MR* < *MrtvoRođeni*, ‘born dead’. There is also an example of ellipsis in the source phrase in which grammatical words (*do, iz*) were omitted. *MOB* < *Mortalitet do Otpusta iz Bolnice*, ‘mortality before being released from hospitalization’ is described by the *LLL E* descriptor (acronyms in broader sense). The *PLL* descriptor is also applied for the acronym *TIVA* which was formed from *Totalna IntraVenska Anestezija*, i.e. ‘total intravenous anaesthesia’.

6. Classification of adaptation of English medical abbreviations to the Croatian language.

Similar cases of neologism formation in Croatian medical terminology, based on English non-morphemic word-formation models, and different ways of adaptation of English medical abbreviations to Croatian, will be dealt with in the following passage.

The corpus of abbreviations and its adaptation to Croatian medical terminology will partly be classified according to Filipović’s classification of orthography adaptation. Filipović’s approach offers four ways of orthography adaptation: a) according to the pronunciation of a model lexeme, b) according to its original orthography; c) according to the combination of its pronunciation and orthography, and d) according to an intermediary language (Filipović 1990: 28-29). However, as we are dealing here with morphologically different part of the English lexicon, this classification will be slightly modified. When foreign abbreviations are being adapted to a different language system, their adaptation on the orthographic level is also simultaneously conditioned by their pronunciation. Pronunciation can be of three kinds, which means that they can be pronounced as models, they can be pronounced as regular abbreviations from the receiving language, or there can be a combination of both English and Croatian pronunciation.

With regard to the mentioned peculiarities, we believe that those different kinds of pronunciation make a very explicit reason for the supplement of the principles set out

⁵ Interestingly, according to its classification, the English NSAID belongs to the same category described by *PPL*, but due to its form it is not an alphabethism but a hybrid form.

for the orthographic level in adaptation of borrowings. We believe that their adaptation can be better described by different degrees of substitution (1st, 2nd, and 3rd) on the orthographic level, i.e. zero, partial/compromise, and complete adaptation on the orthographic level. The substitution or adaptation on the orthographic level is tentatively named *transgraphemization*, in accordance with other terms for different linguistic levels, e.g. transphonemization, transmorphemization. *Zero orthographic change* involves the adaptation of original abbreviations, both with their English orthographic and pronouncing forms, e.g. *MR*, *FM*, *NMR*. *Partial or compromise adaptation* refers to those adapted with English orthography and full or partial Croatian pronunciation, e.g. *2D-NMR* [dvadeenemar], or *FRAP* [fɾap]. *Complete adaptation* on the orthographic level refers to those abbreviations which adapted the English orthography but are pronounced as ordinary Croatian abbreviations, e.g. *ANN*, *CTG*, *CDDS*, *ELISA*. As this theoretical explanation needs more extensive research to be fully justified, we take it as an experimental approach for the corpus analysed in this work. Our next research studies of other professional terminology fields will try to determine fully all the necessary points in that part of the theoretical framework. The following table summarizes the adaptation degrees on the orthographic level.

ORTHOGRAPHIC LEVEL			
substitution	transgraphemization	orthography	pronunciation
a) first degree	a) zero	English	English
b) second degree	b) partial/compromise	English	English/Croatian
c) third degree	c) full	English	Croatian

6.1. Alphabethisms

The great majority of alphabethisms in our corpus is completely adapted, i.e. with the English orthography and the Croatian pronunciation, e.g. *BCS*, *DNA*, *DTA*, *ECT*. The simplest cases of such adaptation are those alphabethisms formed from the initial letters of the Latin lexemes in source phrases, e.g. *HPV* < *Human Papilloma Virus*, *FM* < *Fetal Mortality*, *PNM* < *PeriNatal Mortality*. The rest of alphabethisms is rarely adapted according to the zero and the partial degree of adaptation. Sometimes, as is the case with *BBB* or *FM* (either [ˈβiːβiːβiː] or [ˈβɛβɛβɛ], and [ˈɛφɛμ]), alphabethisms can have variational forms, i.e. they can be adapted according to the zero adaptation, partial/compromise or complete adaptation. Due to employment of the language economy principle in everyday language practice, some English alphabethisms, when adapted to Croatian, are pronounced as acronyms, and therefore make a special group of so-called *pseudoacronyms*, such as *ASA* [ασα], *FIA* [φiα], *FID* [φiδ], *END* [ɛvδ], *MEM* [μɛμ], *LOD* [λoδ], *ISFIF* [ˈiσφiφ], etc.

They are labelled as pseudoacronyms because they are not pronounced as acronyms in English, but as alphabethisms.

English alphabethisms are rarely translated in Croatian, both source-phrase elements and alphabethisms correspondingly, e.g. *VLBW* < *Very Low Birth Weight*, i.e. *VNPT* < *Vrlo Niska Porodna Težina*; *ELBW* < *Extremely Low Birth Weight*, i.e. *INPT* < *Izrazito Niska Porodna Težina*, etc. Even more infrequent are those alphabethisms with a combination of English and Croatian orthography, i.e. with the adapted initials of English elements from the source phrase and the initials of Croatian translated elements, e.g. in English we have *COPD* for *Chronic Obstructive Pulmonary Disease*, and in Croatian – *COPB* [‘ko’pe’βε] with *OPB* for *Obstruktivna Pulmonalna Bolest*; *MOF* for *MultiOrganic Failure* in English, while *MOD* for *MultiOrganska Disfunkcija* in Croatian.

6.2. Acronyms

The majority of acronyms in our corpus is completely adapted, i.e. with English orthography and Croatian pronunciation, e.g. *POP* [ποπ], *SEM* [σεμ], *ELISA* [e’lisa]. Partially adapted are those with English orthography and full or partial Croatian pronunciation, e. g. *PATRICIA* [πα’τριχια], *HAPO* [‘ηαπο], *HETCOR* [‘ηετκ≅], *GRAS* [‘γρασ]. Acronyms adapted by the zero orthographic change, such as *TOCSY* [‘τοκσι], and *SMILES* [‘σμαιλς] are infrequent.

6.3. Hybrid forms

The adaptation of hybrid forms can also be divided according to three degrees of transgraphemization. As these forms are made by combining alphabethisms and acronyms, with initials being read as regular Croatian letters, most of them are adapted by partial or full transgraphemization. *NAID* [εν’ειδ], *NSAID* [ενεσ’ειδ], *UVVIS* [υθε’ωισ], *MMcC* [εμμεκ’χε]/[εμμεκ’σι:] are hybrids partially adapted, and *VEGF* [βεγ’εφ], *PPROM* [πε’προμ], *E-EBGO* [ε’εβγο] are examples of the full adaptation.

Conclusion

For the purposes of the research, alphabethisms, acronyms and hybrid forms in English medical terminology were classified according to two criteria: broader and narrower sense. The narrower sense refers to those formed according to the orthographic norms. The broader sense is understood as the ways and processes of the formation, more or less different from the orthographic norms. For a better and

transparent description and classification of terms, a set of so-called descriptors was introduced. The descriptors describe the elements of abbreviations in both narrower and broader sense. Generally speaking, initials of descriptors are of two kinds – those representing capital and those representing small letters, i.e. *L* and *l*, respectively. All other initials describe the final realizations of abbreviations with different orthographic or morphological characteristics (*P* for affixes, *N* for numerals, *S* for syllables, and *W* for a whole word; *LL* stands for the first two or any other graphemes of one lexeme, *E* for ellipsis, *C* for conversion, *M* for metathesis, and *A* for addition of a word or a diacritic sign).

The alphabetisms in narrower sense are the most abundant in this research and are formed of initials written with capital letters and taken from every single element (lexemes) of source phrases. For those formed in broader sense, various formational differences were analysed and classified accordingly, such as: initials for final graphemes, compounds, affixes, grammatical and lexical words, as well as different orthographic changes, such as ellipsis, conversion, metathesis and addition. Among the most notable feature is the ellipsis of either grammatical or lexical words (or sometimes both) and the use of blankness between initials in alphabetisms. Ellipsis can be of three kinds: either a lexical or grammatical word is omitted, or both lexical and grammatical words are omitted. Alphabetisms with blankness between initials are of two kinds: those with the conditioned and those with the unconditioned blankness between initials. Alphabetisms with initials referring to affixes (prefixes) are of two kinds: the first with only one initial for an affix and the second with more than one initial for affixes. Small letters in medical alphabetisms are rare. They can be used for abbreviated grammatical words, or for the second element of the first two graphemes in words. Hyphens and slant lines in alphabetisms are also rare. Alphabetisms with hyphens and slant lines are divided into alphabetisms which retained a hyphen or a slant line in the same position as it was in the source phrase, and those in which some hyphens or slant lines from the source phrase were omitted and new ones in alphabetisms were added. Alphabetisms with numerals are divided into two groups: those formed by taking initials of every element of the source phrase and by transferring a diacritic sign and a numeral, and those formed by taking initials for each lexical element of the source phrase, omitting some lexemes, converting lexemes into numerals, and adding diacritic signs not found in source phrases.

The acronyms in narrower sense are formed of initials taken from every word in a phrase. Acronyms in broader sense can be formed by taking either an initial or a final letter of a source phrase constituent, by taking initials of each compound con-

stituent, by omitting a lexical or grammatical word, by changing the order of initials to that of a source phrase or using groups of graphemes and syllables. Ellipsis can be of two kinds: either a grammatical word or both lexical and grammatical are omitted from acronyms. Acronyms with a combination of initials referring to lexical morphemes and affixes belong to one group – the group with only an initial for an affix and/or an initial for a combining form. Metathesis is found in only one acronym. There are three acronyms with abbreviated syllables classified into three sub-categories: one made of a syllable and initials for the initial and final graphemes, one in which the ellipsis of a grammatical word is used, and one in which more syllables were abbreviated and both lexical and grammatical words were omitted.

The classification of hybrid forms is also divided according to the criteria of narrower and broader sense. The resultant forms are partially pronounced as alphabetsisms and partially as acronyms. The hybrids in narrower sense are formed by abbreviating initials of source phrase components and are partially pronounced as acronyms. The hybrids in broader sense are formed by omission of some elements, by abbreviating affixes/combining forms, by adopting the first two initial graphemes (both a capital and a small letter), by the changed position of initials and by addition of initials.

In the analysis of Croatian medical alphabetsisms and acronyms, the material assembled from the available sources gives considerable evidence that the descriptors can also be applied to their classification.

The corpus of abbreviations and its adaptation to Croatian medical terminology was described by different degrees of substitution on the orthographic level (transgraphemization), i.e. zero, partial/compromise, and complete adaptation on the orthographic level. Original abbreviations, both with their English orthographic and pronouncing forms, are adapted by zero orthographic change. Those with English orthography and full or partial Croatian pronunciation are adapted by partial or compromise adaptation. Those with English orthography and pronounced as ordinary Croatian abbreviations are adapted by complete adaptation.

APPENDIX

ABB.	SOURCE PHRASE	DESCRIPTOR	ABB. TYPE	ABB. LENGTH	S.P. LENGTH	ORTH. CHANGE	DETAILS	SEM. FIELD
2D-NMR	two-Dimensional Nuclear Magnetic Resonance	NLL	Alph.	6	4	E, A	punct	2
AD	Alzheimer's Disease	LLL	Alph.	2	2			1
ANN	Artificial Neural Network	LLL	Alph.	3	3			3
API	Active Pharmaceutical Ingredient	LLL	Alph.	3	3			4
ASA	American Society of Anesthesiologists	LLL	Alph.	3	4	E	prep	5
ASRM	American Society for Reproductive Medicine	LLL	Alph.	4	5	E	prep	5
BBB	Blood-Brain Barrier	LLL	Alph.	3	2			1
BCS	Biopharmaceutical Classification System	LLL	Alph.	3	3			6
BSA	Bovine Serum Albumin	LLL	Alph.	3	3			7
C NMR	Carbon-13 Nuclear Magnetic Resonance	L LL	Alph.	4	4	E	punct, num	2
CDC	Centre for Disease Control and prevention	LLL	Alph.	3	6	E	prep, conj, N	5
CDDS	Colon targeted Drug Delivery Systems	LLL	Alph.	4	5	E	V	4
CDRI	Central Drug Research Institute	LLL	Alph.	4	4			5
CIMS	Chemical Ionisation Mass Spectrometry	LLL	Alph.	4	4			2
CMC	Critical Micellar Concentration	LLL	Alph.	3	3			1
CMG	Coat Mass Gain	LLL	Alph.	3	3			6
CMM	Critical Molecular Mass	LLL	Alph.	3	3			4
CNS	Central Nervous System	LLL	Alph.	3	3			8
CO	Cardiac Output	LLL	Alph.	2	2			9
COPD	Chronic Obstructive Pulmonary Disease	LLL	Alph.	4	4			1
CPCSEA	Committee for the Purpose of Control and Supervision of Experiments on Animals	LLL	Hybr.	6	12	E	prep x4, art, conj	5
CTG	Control Treatment Group	LLL	Alph.	3	3			2

ABB.	SOURCE PHRASE	DESCRIPTOR	ABB. TYPE	ABB. LENGTH	S.P. LENGTH	ORTH. CHANGE	DETAILS	SEM. FIELD
DE	Dissolution Efficiency	LLL	Alph.	2	2			6
DIAP	Drug-In-Adhesive Patch	LLL	Acr.	4	2			4
DNA	DeoxyriboNucleic Acid	PPL	Alph.	3	2	E	affix	7
DP	Dispersion Polymerization	LLL	Alph.	2	2			4
DSC	Differential Scanning Calorimetry	LLL	Alph.	3	3			2
DST	Department of Science and Technology	LLL	Alph.	3	5	E	prep, conj	5
DT	Disintegration Time	LLL	Alph.	2	2			6
DTA	Differential Thermal Analysis	LLL	Alph.	3	3			2
EAC	Ehrlich's Ascites Carcinoma	LLL	Alph.	3	3			1
EAGO	European Association of Gynecology and Obstetrics	LLL	Alph.	4	6	E	prep, conj	5
EAPM	European Association of Perinatal Medicine	LLL	Alph.	4	5	E	prep	5
EAS	External Anal Sphincter	LLL	Alph.	3	3			8
EBGO	European Board of Obstetrics and Gynecology	LLL	Acr.	4	6	E, M	prep, conj	5
ECT	ElectroChemoTherapy	PPL	Alph.	3	1			2
EE	Encapsulation Efficiency	LLL	Alph.	2	2			6
E-EBGO	Extended European Board of Obstetrics and Gynecology	LLL	Hybr.	6	7	E, M	prep, conj	5
EFC	Emulsifier-Free emulsion Copolymerization	LLL	Alph.	3	3	E	N	4
EGF	Epidermal Growth Factor	LLL	Alph.	3	3			6
EGF-dextran	Epidermal Growth Factor-dextran	LL-W	Hybr.	5	3			6
ELBW	Extremely Low Birth Weight	LLL	Alph.	4	4			6
ELISA	Enzyme-Linked ImmunoSorbent Assay	PPL	Acr.	5	3	E	punct	2
END	Early Neonatal Death	LLL	Alph.	3	3			6
ENGBSS	Early Neonatal Group B Streptococcal Septicemia	LLL	Alph.	6	6			1
EOC	Epithelial Ovarian Cancer	LLL	Alph.	3	3			1
EP	Emulsion Polymerization	LLL	Alph.	2	2			4
EPR	Electron Paramagnetic Resonance	LLL	Alph.	3	3			2

ABB.	SOURCE PHRASE	DESCRIPTOR	ABB. TYPE	ABB. LENGTH	S.P. LENGTH	ORTH. CHANGE	DETAILS	SEM. FIELD
FAB	Fast Atom Bombardment	LLL	Acr.	3	3			2
FBS	Foetal Bovine Serum	LLL	Alph.	3	3			4
FD	Fetal Death	LLL	Alph.	2	2			6
FDA	Food and Drug Administration	LLL	Alph.	3	4	E	conj	5
FDSDS	Floating Drug Delivery Systems	LLL	Alph.	4	4			4
FI	Fecal Incontinence	LLL	Alph.	2	2			1
FIA	Flow Injection Analysis	LLL	Alph.	3	3			2
FID	Flame Ionization Detector	LLL	Acr.	3	3			2
FM	Fetal Mortality	LLL	Alph.	2	2			6
FRAP	Ferric Reducing Ability of Plasma	LLL	Acr.	4	5	E	prep	6
FT NMR	Fourier Transform Nuclear Magnetic Resonance	L LL	Alph.	5	5			2
FTIR	Fourier Transform InfraRed	PLL	Alph.	4	3			2
GABA	Gamma-AminoButyric Acid	PPL	Acr.	4	2			7
GC/MS	Gas Chromatography/Mass Spectrometry	L/LL	Alph.	5	5			2
GC-MS	Gas Chromatography-Mass Spectrometry	L-LL	Alph.	5	3			2
GI	Growth Inhibition	LLL	Alph.	2	2			2
GIT	GastroIntestinal Tract	PLL	Alph.	3	2			8
GPC	Gel Permeation Chromatography	LLL	Alph.	3	3			2
GRAS	Generally Regarded As Safe	LLL	Acr.	4	4			4
GRDDS	GastroRetentive Drug Delivery Systems	PLL	Alph.	5	4			4
GSE	Grapefruit Seed Extract	LLL	Alph.	3	3			4
H NMR	Hydrogen-1 Nuclear Magnetic Resonance	L LL	Alph.	5	4	E	punct, num	2
HAPO	Hyperglycemia Adverse Pregnancy Outcome	LLL	Acr.	4	4			6
HBSS	Hank's Balanced Salt Solution	LLL	Alph.	4	4			4
HELLP	Hemolysis Elevated Liver enzymes and Low Platelets	LLL	Acr.	5	7	E	N conj	7

ABB.	SOURCE PHRASE	DESCRIPTOR	ABB. TYPE	ABB. LENGTH	S.P. LENGTH	ORTH. CHANGE	DETAILS	SEM. FIELD
HMBC	Homonuclear Multiple Bond Coherence	LLL	Alph.	4	4			6
HMBC	Heteronuclear Multiple-Bond Correlation	LLL	Alph.	4	3			2
HPLC	a) High-Performance Liquid Chromatography	LLL	Alph.	4	3	E	punct	2
	b) High Performance Liquid Chromatography	LLL	Alph.	4	4			2
HPSAM	H-Point Standard Additions Method	LLL	Alph.	5	4	E	punct	2
HPTLC	a) High Performance Thin Layer Chromatography	LLL	Alph.	5	5			2
	b) High-Performance Thin-Layer Chromatographic	LLL	Alph.	5	3	E	punct	2
HPV	Human Papilloma Virus	LLL	Alph.	3	3			1
HSM	Hot Stage Microscopy	LLL	Alph.	3	3			2
HSQC	Heteronuclear Single Quantum Coherence	LLL	Alph.	4	4			6
HSV-1	Herpes Simplex Virus-1	N-LL	Alph.	5	3			1
IADPSG	International Association of Diabetes and Pregnancy Study Group	LLL	Alph.	6	8	E	prep, conj	5
IAEC	Institutional Animal Ethics Committee	LLL	Alph.	4	4			5
IARC	International Agency for Research of Cancer	LLL	Hybr.	4	6	E	prep, prep	5
IAS	Internal Anal Sphincter	LLL	Alph.	3	3			8
IBS	Irritable Bowel Syndrome	LLL	Alph.	3	3			1
ICMR	Indian Council of Medical Research	LLL	Alph.	4	5	E	prep	5
IM	Infant Mortality	LLL	Alph.	2	2			6
IS	Internal Standard	LLL	Alph.	2	2			6
ISFIF	<i>In Situ</i> Forming Intra gastric Formulations	LLL	Acr.	5	5			4
IST	Isothermal Stress Testing	LLL	Alph.	3	3			2
IUGR	IntraUterine Growth Restriction	PLL	Alph.	4	3			1
IUS	Internal Urethral Sphincter	LLL	Alph.	3	3			8

ABB.	SOURCE PHRASE	DESCRIPTOR	ABB. TYPE	ABB. LENGTH	S.P. LENGTH	ORTH. CHANGE	DETAILS	SEM. FIELD
JEV	Japanese Encephalitis Virus	LLL	Alph.	3	3			1
LASPP	Liquid AntiSolvent Precipitation Process	PLL	Acr.	5	4			4
LBD	Loose Bulk Density	LLL	Alph.	3	3			6
LC-MS	Liquid chromatography–mass spectrometry	L-LL	Alph.	5	3			2
LD50	mean lethal dose	NLL	Alph.	4	3	C	num > adj	6
LGA	Large-for-Gestational-Age	LLL	Alph.	3	1	E		6
LMPSA	Low Melting Point Sugar Alcohol	LLL	Alph.	5	5			4
LMS	Low-Molecular-Mass Salt	LLL	Alph.	3	2	E	V/N	4
LOD	Limits Of Detection	LLL	Alph.	3	3			6
LOQ	Limits Of Quantification	LLL	Alph.	3	3			6
MAP	Mitogen-Activated Protein	LLL	Acr.	3	2	E	punct	7
MDT	Mean Dissolution Time	LLL	Alph.	3	3			6
MEM	Minimum Essential Medium	LLL	Acr.	3	3			4
MFH	Magnetic Fluid Hyperthermia	LLL	Alph.	3	3			2
MFPR	MultiFetal Pregnancy Reduction	PLL	Alph.	4	3			2
MIC	Minimal Inhibitory Concentration	LLL	Alph.	3	3			6
MLC	Micellar Liquid Chromatography	LLL	Alph.	3	3			2
MLRA	Multiple Linear Regression Analysis	LLL	Alph.	4	4			2
MMcC	Minimal MiCrobicidal Concentration	LL	Hybr.	4	3			6
MNPCE	MicroNucleated PolyChromatic Erythrocyte	PPL	Alph.	5	3			2
MST	Mean Survival Time	LLL	Alph.	3	3			6
MVTR	Moisture Vapor Transmission Rate	LLL	Alph.	4	4			6
NAS	Net Analyte Signal	LLL	Alph.	3	3			2
NCRRT	National Centre for Radiation Research and Technology	LLL	Alph.	5	7	E	prep, conj	5
NFT	NeuroFibrillary Tangles	PLL	Alph.	3	2			1

ABB.	SOURCE PHRASE	DESCRIPTOR	ABB. TYPE	ABB. LENGTH	S.P. LENGTH	ORTH. CHANGE	DETAILS	SEM. FIELD
NMR	Nuclear Magnetic Resonance	LLL	Alph.	3	3			2
NNRTI	Non-Nucleoside Reverse Transcriptase Inhibitor	PLL	Alph.	5	4	E	punct	4
NOESY	Nuclear Overhauser Effect Spectroscopy	LLL	Acr.	5	4			2
NS	Nervous System	LLL	Alph.	2	2			8
NAID or NSAID	NonSteroidal Anti-Inflammatory Drug	PPL/PLL	Hybr.	5/4	3		punct	4
OBSQID	OBStetrical Quality Indicators and Data	SLL	Acr.	6	5	E	conj	6
OD	Optical Density	LLL	Alph.	2	2			6
ODT	Orally Disintegrating Tablet	LLL	Alph.	3	3			4
OND	Office of New Drugs	LLL	Alph.	3	4	E	prep	5
OPLS	Optimized Potentials for Liquid Simulations	LLL	Alph.	4	5	E	prep	3
PATRICIA	PApilloma-virus TRial against Cancer In young Adults	SSL	Acr.	8	7	E	N, prep, adj	2
PBS	a) Phosphate Buffered Saline	LLL	Alph.	3	3			4
	b) Phosphate Buffer Solution	LLL	Alph.	3	3			4
PCR	Principal Component Regression	LLL	Alph.	3	3			2
PCS	Photon Correlation Spectroscopy	LLL	Alph.	3	3			2
PE	PreEclampsia	PLL	Alph.	2	1			1
PFTC	Primary Fallopian Tube Cancer	LLL	Alph.	4	4			1
PhRMA	Pharmaceutical Research and Manufacturers of America	LLL	Alph.	5	6	E	conj, prep	5
PII	Primary Irritation Index	LLL	Alph.	3	3			6
PIGF	Placental Growth Factor	LLL	Alph.	4	3			6
PM	Physical Mixture	LLL	Alph.	2	2			4
PMAA	Partially Methylated Alditol Acetate	LLL	Alph.	4	4			4
PMN	PolyMorphoNuclear leukocyte	PPL	Alph.	3	2	E	noun	7
PNM	PeriNatal Mortality	PLL	Alph.	3	2			6
POP	Pelvic Organ Prolapse	LLL	Alph.	3	3			1
PP	Peyer's Patches	LLL	Alph.	2	2			4

ABB.	SOURCE PHRASE	DESCRIPTOR	ABB. TYPE	ABB. LENGTH	S.P. LENGTH	ORTH. CHANGE	DETAILS	SEM. FIELD
PPROM	Preterm Premature Rupture Of Membranes	LLL	Hybr.	5	5			1
PSA	Pressure-Sensitive Adhesive	LLL	Alph.	3	2			4
PSRC	Pharmaceutical Sciences Research Center	LLL	Alph.	4	4			5
PTG	Placebo Treatment Group	LLL	Alph.	3	3			2
PTLC	Preparative Thin-Layer Chromatography	LLL	Alph.	4	3	E	punct	2
QbD	Quality by Design	LLL	Alph.	3	3			6
QC	Quality Control	LLL	Alph.	2	2			6
QSAR	Quantitative Structure-Activity Relationship	LLL	Alph.	4	3	E	punct	3
QSPR	Quantitative Structure-Property Relationship	LLL	Alph.	4	3	E	punct	3
RF	Reference Formulation	LLL	Alph.	2	2			3
RI	Retention Indices	LLL	Alph.	2	2			3
RNA	RiboNucleic Acid	LLL	Alph.	3	2			7
ROS	Reactive Oxygen Species	LLL	Alph.	3	3			7
RP	Reservoir Patch	LLL	Alph.	2	2			4
RP-HPLC	Reversed-Phase High-Performance Liquid Chromatography	L-LL	Alph.	7	4	E, A	punct	2
RSLM	Reponse Surface Linear Modelling	LLL	Alph.	4	4			3
RTG	Reference Treatment Group	LLL	Alph.	3	3			2
s/o/w	solid-in-oil-in-water	l/l/l	Alph.	5	1	E	prep	4
SD	Solid Dispersion	LLL	Alph.	2	2			4
SDL	Spray Dried Lactose	LLL	Alph.	3	3			4
SEDDS	Self-Emulsifying Drug Delivery Systems	LLL	Acr.	5	4	E	punct	6
SEM	a) Scanning Electron Microscopy	LLL	Alph.	3	3			2
	b) Scanning Electron Microphotographs	LLL	Alph.	3	3			2
	c) Scanning Electron Micrographs	LLL	Alph.	3	3			2
SGA	Small-for-Gestational-Age	LLL	Alph.	3	1	E	prep	6

ABB.	SOURCE PHRASE	DESCRIPTOR	ABB. TYPE	ABB. LENGTH	S.P. LENGTH	ORTH. CHANGE	DETAILS	SEM. FIELD
SGF	Simulated Gastric Fluid	LLL	Alph.	3	3			4
SIF	Simulated Intestine Fluid	LLL	Acr.	3	3			4
SMD	Short Multifactorial Design	LLL	Alph.	3	3			3
SMILES	Simplified Molecular Input Line Entry System	LLL	Acr.	6	6			3
SR	Sustained Release	LLL	Alph.	2	2			2
SRC	Syracuse Research Corporation	LLL	Alph.	3	3			5
STP	Stationary Time of upper Punch displacement	LLL	Alph.	3	6	E	prep, adj, N	2
SUI	Stress Urinary Incontinence	LLL	Alph.	3	3			1
SVR	Systemic Vascular Resistance	LLL	Alph.	3	3			9
TAP	Total Antioxidant Power	LLL	Alph.	3	3			3
TAS	a) Total Antioxidant Status	LLL	Alph.	3	3			3
	b) Total Antioxidative Status	LLL	Alph.	3	3			3
TBARS	ThioBarbituric Acid Reactive Substances	LLL	Hybr.	5	4			3
TBD	Tapped Bulk Density	LLL	Alph.	3	3			6
TDDS	Transdermal Drug Delivery System	LLL	Alph.	4	4			6
TEM	Transmission Electron Microscopy	LLL	Alph.	3	3			2
TF	Test Formulation	LLL	Alph.	2	2			6
TFT	Total Floating Time	LLL	Alph.	3	3			3
TGA	ThermoGravimetric Analysis/ Thermal Gravimetric Analysis	PLL/ LLL	Alph.	3	2/3			3
TLC	Thin Layer Chromatography	LLL	Alph.	3	3			2
TOCSY	TOTal Correlation SpectroscopY	SLL	Acr.	5	3			2
TSH	Thyroid Stimulating Hormone	LLL	Alph.	3	3			7
TTG	Test Treatment Group	LLL	Alph.	3	3			2
UCP	Urethral Closing Pressure	LLL	Alph.	3	3			3
UV/VIS	UltraViolet-Visible Spectroscopy	LL/L	Hybr.	6	2			2
VEGF	Vascular Endothelial Growth Factor	LLL	Hybr.	4	4			7
VLBW	Very Low Birth Weight	LLL	Alph.	4	4			6
VLDL	Very Low-Density Lipoprotein	LLL	Alph.	4	3			7

ABB.	SOURCE PHRASE	DESCRIPTOR	ABB. TYPE	ABB. LENGTH	S.P. LENGTH	ORTH. CHANGE	DETAILS	SEM. FIELD
w/o/w	water-in-oil-in-water	/l/l/l	Alph.	5	1	E	prep	4
WGCM	Wet Granulation Compression Method	LLL	Alph.	4	4			2
WHO	World Health Organization	LLL	Alph.	3	3			5
XPD	X-ray Powder Diffraction	LLL	Alph.	3	3			2
XRD	a) X-Ray Diffractometry	LLL	Alph.	3	2			2
	b) X-Ray Diffraction	LLL	Alph.	3	2			2
XRPD	a) X-ray Powder Diffraction	LLL	Alph.	4	3			2
	b) X-Ray Powder Diffractometry	LLL	Alph.	4	3			2

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Ivo Fabijanić, Frane Malenica

Kratice u engleskome medicinskom nazivlju i njihova prilagodba hrvatskomu jeziku

SAŽETAK

U radu su provedene podjela i raščlamba kratica, akronima i hibridnih oblika na ograničenom materijalu engleskoga medicinskog nazivlja. Kratice i akronimi podijeljeni su prema dva načelima: užem i širem smislu, a njihove razlike u ortografskoj tvorbi opisane su nizom posebno predviđenih deskriptora. Takva mogućnost opisa, podjele i raščlambe primijenjena je na korpusu engleskog i hrvatskog medicinskog nazivlja. U raščlambi prilagodbe ortografije engleskih kratica predložena su tri stupnja podjele: nulta ortografska promjena, djelomična i potpuna prilagodba. Zamjena i prilagodba na ortografskoj razini naziva se transgrafemizacija.

Ključne riječi: engleski, kratice, akronimi, medicina, deskriptori, prilagodba, hrvatski, transgrafemizacija, nulta ortografska promjena, djelomična i potpuna prilagodba