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Realizations of Prepositions and Prepositional Phrases in Professional Medical Texts in English Language

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SUMMARY

Prepositions and prepositional phrases play an important role in the professional medical register in English and they are very abundant. Realization of the prepositions in medical texts could cause difficulties to non-native English language speakers scientists.

The subject of this paper is prepositions with their meanings (single and multiple). Preposition cannot appear independently and therefore we treated it together with its prepositional complement with which it forms prepositional phrases. In this paper we were not focused on the prepositional phrase functions within other sentence structures (phrases or clauses) but on internal relationship between preposition and its complement, especially on prepositions and prepositional phrase meanings in professional medical texts.

Key words: preposition, prepositional phrase, medical discourse

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INTRODUCTION

It is well known that the English language is the leading language in the medical discourse. Communication in medical English has been essential throughout the history of medicine (1). Dominance of the English language in medical communication can be clearly pointed out by Ribes' statement that unless you know enough English to read the medical literature, it is almost impossible to keep up to date with medical advances (2). The fact that medical experts systematically engage in specific genres is a key factor in the medical communication. Another very important element is the fact that doctors around the world basically communicate in only one language-English. It carries a range of consequences for all professionals in this field: first, a significant level of knowledge and use of the English language must be possessed in order to read about new advances and achievements in their discipline if they want to publish their findings internationally.

Medical discourse

Medical language is traditionally considered as a language used by medical professionals when communicating in the expert-to-expert context. It is the language of "specialists," often defined as special language as opposed to general language used by population in everyday situations (3). Medicine, and many other fields, has its own specific language on several different levels: doctor-doctor, doctor-patient, doctor-patient family (4).

The medical profession (especially clinical medicine) is full of jargon and idiosyncratic phrases that sound strange in the context of everyday speech and writing (5).

The most obvious feature of medical language is the use of medical jargon. Apart from medical jargon, medical doctors also favor the passive constructions and style that focuses on objective, measurable phenomena (6). This style is achieved through the use of longer noun phrases, passive sentences, and the preference for the third person pronoun more than the first. Medical jargon allows the specialist to provide accurate and concise information to other professionals who are trained to understand and talk about the physical world in a rational, objective and measurable way.

Prepositions

Prepositions and prepositional phrases play an important role in the professional medical language in English. For this reason we decided to deal with prepositions in this type of professional text. Definition can be drawn from most of the relevant sources. The preposition is an unchangeable word that shows the relationship between nouns or pronouns and other words or

groups of words in a sentence (7). Also, it can be said that in the English language a preposition expresses a relation between two entities, one being that represented by the prepositional complement. (8). There are different types of relations: the relation of time, place, instrument or causes. In grammar, preposition is a type of adposition, grammatical particle that establishes a connection between the object (usually a noun phrase) and some other parts of the sentence, often expressing location in time and place (9).

Prepositions in English can be classified according to different criteria: formal, semantic and syntactic.

Regarding formal criterion, prepositions can be divided into: simple (at, by, in, of, on, to, ...), complex (apart from, because of, by means of, due to, in addition to, in spite of. ..) and marginal prepositions (the cases of some forms of prepositions that they share with conjunctions as a special type of grammatical words-after, as, before, since, until, or with adverbs that belong to the lexical words-about, across, around before, beyond, down, in, inside, near, on, opposite, past, through, under, up, within).

Prepositions and prepositional phrases can syntactically function as: adverbial, adjunct, disjunct, conjunct, postmodifier in a noun phrase, complementation of a verb or complementation of an adjective in an adjective phrase (8).

According to semantic criterion (prepositional meaning), prepositions can be divided into: place prepositions, time prepositions, prepositions of origin, source, cause, aim, means, instrument, manner, agentive, accompaniment, exception, reference, subject matter etc.

MATERIAL AND METHOD

Bearing in mind the difficulties, regarding the selection of appropriate prepositions, which local authors may face in using English in papers they wish to publish in international journals, we will deal with the realization of prepositions in professional medical texts.

After reviewing the medical literature published in magazines and on the Internet, we decided to randomly choose the medical texts in English that will serve as a corpus on which we will perform the analysis of prepositions and prepositional phrases.

Medical texts chosen as the material for the analysis are: **Smoker's face: An underrated clinical sign?** and **Paces of the heart: morning mortality.**¹

¹Texts from British Medical Journal 21-28, Volume 291 and Newsweek, 1985.

However, in order to confirm the purpose of analysis, we have processed and analyzed several independent abstracts with the aim of checking the primary analysis. We selected abstracts as a kind of condensed text most suitable for additional analysis. We decided to randomly choose four abstracts published in the British Medical Journal in September 2009:

- **Preoperative risk assessment for bleeding and thromboembolism;**
- **Autoimmune liver disease for the non-specialist;**
- **Effects of a physiotherapy and occupational therapy intervention on mobility and activity in care home residents: a cluster randomised controlled trial;**
- **The benefits of steroids versus steroid plus antivirals for treatment of Bell's palsy: a meta-analysis².**

When selecting materials, we considered the following: selected texts were from older and more recent articles, texts are not from the same authors and medical topics covered in these texts are different. In this way we wanted to have different topics in the texts, and avoid possible similar realization of prepositions due to similar themes.

All prepositions are separated and sorted into categories depending on the selection criteria for classification, where the emphasis is placed on the semantic classification. Then, we calculated percentage of representation for all prepositions in the texts, and we paid attention to the number of categories and dominance of certain realization and meanings.

Our aim was to determine the presence, number, and representation of prepositions and to determine prepositional meanings and realizations in this type of professional texts.

RESULTS

We performed classification of prepositions by several criteria and we started with the formal classification which divides prepositions into:

- 1 Simple;
- 2 Complex.

1 Simple prepositions which appeared in the texts were: **about, after, among, as, at, before, between, by, during, for, from, in, into, of, on, out, over, than, through, to, under, up, upon, with, within, without.**

2 Complex prepositions which we found were: **according to, account for, as (...), as, because of, due to, except in, on the basis of, to date, under way, with the exception of.**

Analysis was focused on semantic classification of prepositions and prepositional phrases in the selected texts due to the fact that our primary interest in this paper was relationship between preposition and its complement, prepositional meanings and realization of prepositions in professional medical texts. Classification of prepositions from semantic aspect (the meaning of prepositions) led to the formation of a number of categories of meaning. The categories in which we placed prepositions, and analyzed them are:

“Having”/possession: *in, of, with*

Negative of “having”: *without*

Place: *at, on, of, from, in, into, between, among, to, through*

Time: *at, for, in, within, between, after, during, before*

Cause: *as, because of, due to, for, from*

Intention: *to*

Manner: *at, by, without*

Means/instrument: *by, with*

Agentive: *by*

Comparison: *as (as...as), than, such as*

Exception: *of, except of, with the exception of*

Metaphorical use: *on a roll of the dice-pukom slučajnošću (bacanjem kocke), under (consideration), under way-započet/ koji se događa, upon admission-po prijemu.*

Table 1 shows only prepositions (simple and complex) that have occurred in selected samples of text for analysis according to their meanings.

²All abstracts were published in British Medical Journal in September 2009 under the following references:

BMJ 2009;339:b2299, BMJ 2009;339:b3305, BMJ 2009;339:b3123, BMJ 2009;339:b3354 respectively.

Table 1. Distribution of prepositions according to their meanings. Sign 0 was placed where preposition did not appear, while sign x was placed where preposition appeared

Preposition	Meaning									
	Having/ not having *	Place	Time	Cause	Intention/ aim	Mann- er	Mean/ instru- ment	Agentive	Comparison	Excep- tion
AT	0	x	x	0	0	x	0	0	0	0
IN	x	x	x	0	0	0	0	0	0	0
ON	0	x	0	0	0	0	0	0	0	0
TO	0	x	0	0	x	0	0	0	0	0
OF	x	x	0	0	0	0	0	0	0	x
FOR	0	0	x	0	0	0	0	0	0	0
FROM	0	x	0	x	0	0	0	0	0	0
INTO	0	x	0	0	0	0	0	0	0	0
WITH	x	0	0	0	0	0	x	0	0	0
WITHOUT	x	0	0	0	0	x	0	0	0	0
WITHIN	0	0	x	0	0	0	0	0	0	0
BETWEEN	0	x	x	0	0	0	0	0	0	0
AMONG	0	x	0	0	0	0	0	0	0	0
AFTER	0	0	x	0	0	0	0	0	0	0
BEFORE	0	0	x	0	0	0	0	0	0	0
DURING	0	0	x	0	0	0	0	0	0	0
BY	0	0	0	0	0	x	x	x	0	0
BECAUSE OF	0	0	0	x	0	0	0	0	0	0
DUE TO	0	0	0	x	0	0	0	0	0	0
AS	0	0	0	x	0	0	0	0	x	0
THAN	0	0	0	0	0	0	0	0	x	0
WITH THE EXCEPTION OF	0	0	0	0	0	0	0	0	0	x

STATISTICS

Representation of prepositions in selected texts was 15% of the total number of words; that supports the fact that this word type is frequent in medical texts. Prepositions themselves were variously represented, and some of them were very common and occurred in several categories of meaning, while others were far less frequent.

We have to mention that some of the prepositions, which can be considered as frequent in modern English, did not occur in the selected medical texts at all. These prepositions are: *above, along, against, beside(s), beyond, off, onto, out of, since, toward(s), under, until, by means of, in addition to, in case of, in front of, in spite of, with regard to, etc.*

Table 2 shows the frequency of prepositions appearing in the selected texts in a way that we calculated the percentage of representation of each preposition individually from the total number of prepositions. It has been already said in the paper, and the table clearly shows an uneven appearance of prepositions in the texts.

Table 2. *The percentage prevalence of prepositions in the texts where the percentages were calculated from the total number of prepositions, not the total number of words*

Preposition	Frequency	Percentage (%)
About	5	1.5%
According to	2	0.6%
Among	6	2%
After	3	1%
As	6	2%
At	15	5%
Because of	1	0.3%
Before	3	1%
Between	7	2.3%
By	10	3.3%
Due to	1	0.3%
During	2	0.6%
For	20	6.6%
From	6	2%
In	46	15.6%
Into	3	1%
Of	85	28.7%
On	15	5%
Over	1	0.3%
Than	9	3%
Through	1	0.3%
To	15	5%
Under	2	0.6%
Up	1	0.3%
Upon	1	0.3%
With	20	6.6%
Within	3	1%
Without	5	1.6%
With the exception of	1	0.3%

A review of statistics revealed that the most common prepositions in our articles were: **of** (85 examples), **in** (46 examples), **for** (20 examples), **it** (15 examples), **with** (20 examples), **at** (15 examples), **on** (12 examples) and **by** (10 examples), while the other prepositions (**as**, **than**, **due to**, **because of**, **during**, **within**, **among**, **between**, **into**, **after**, **before**, **with-out** and **from**) had from 1 to 7 examples.

Analysis of the most frequent prepositions according to their meanings revealed that preposition **of** appeared with numerous examples in the categories

of “having” and place with several examples denoting exception.

Preposition **in** appeared in several categories of meaning such as: “having”, place and time. Within these categories it was almost equally present in the categories of “having” and place, while it had fewer examples regarding temporal meaning.

It can be said that preposition **for** was related to temporal meaning and in several examples it was connected with the category of cause. Preposition **to** was used for denoting place and intention.

A member of the category of “having” was preposition **with** and a large number of its examples was connected to this category. Also there were several examples in which it denoted instrument/means.

Preposition **at** occurred in the categories of place, time and manner. It appeared in temporal and spatial meanings equally while in a single example it was used for denoting manner.

Regarding preposition **on**, it was present in selected texts in spatial meaning, while preposition **by** appeared in the categories of manner, instrument and agentive. This preposition was equally present in the mentioned categories.

It can be said that the most numerous and versatile categories of meanings were categories of place and time with nine or eight different prepositions with a large number of examples. They were followed by the category of cause with five different prepositions while other categories had from one to three different prepositions with fewer examples.

DISCUSSION

During the analysis, we observed the following characteristics related to the realization and meanings of prepositions. For example, some prepositions have occurred in only one category of meaning (**on**-place, **into**-place, **within**-time, **among**-place, **after**-time, **before**-time, **during**-time, **because of**-cause, **due to**-cause, **than**-comparison, **with the exception of**-exception), and some have occurred in several of them (**at**-place, time, manner, **in**-“having”, place, time, **of**-“having”, place, exception, **for**-time, cause, **from**-place, cause, **between**-place, time, **by**-manner, instrument, agentive, **as**-cause, comparison, **with**-“having”, means/instrument, **without**-not-“having”, manner).

But this does not mean that mentioned prepositions express only these meanings. In other words, many prepositions can be used for meanings other than those presented in this paper.

For instance, preposition **on** is also used in temporal meaning.

Example:

*I never get up early **on** Sundays.
My birthday is **on** the 3rd of December.*

Preposition **of** can be used for denoting material, quantity, content etc.

Example:

*This is a dress **of** purest silk.
Box **of** matches. (10).*

Although preposition **within** appeared in texts only regarding temporal meaning, it also can be used for spatial meaning.

Example:

***Within** the school grounds uniform must be worn. (11)*

One of the characteristics is that even though several prepositions can be used in one meaning category, these prepositions, except in some rare cases, are not mutually interchangeable without affecting meaning or appropriateness of the sentence. Regardless of their covering the same meaning in some contexts, prepositions within one meaning category are not “the same”.

We noticed that some prepositions can be literally translated into our language, covering the same meaning in both languages, while for some other prepositions that is not the case. Some of the prepositions (such as **for** or **in** regarding temporal meaning) are not even translated into our language.

Example:

*Smokers who had smoked **for** 10 years... Pušači koji su pušili 10 godina...*

***In** 1965 Ippen and Ippen reported similar relation... Ippen i Ippen su prijavili sličnu vezu 1965. godine.*

Specific thing regarding some prepositions such as **about** is that this preposition was present in the texts and in each example it could be translated into our language as *o*, but it was very difficult to place it in any of the categories and it was not placed into tables as well. This preposition was used for subject matter, certain topics which were discussed, speculated about or for gathering information about them.

Examples:

*They were asked by a medical student **about** their age.*

*A postal survey was carried out to collect information **about** exposure to sunlight.*

*Muller can only speculate **about** the reason for the biological rhythm in heart attacks.*

Similar situation was with prepositions **according to**, **in the number of** and **on the basis of**. They were present in the texts, although not frequent, but it was very difficult to classify them into categories.

Examples:

***According to** a study published in The New England Journal of Medicine, more coronaries occur during the morning hours.*

*The difference **in the number of** patients (...) was analyzed by χ^2 test.*

***On the basis of** their occupation patients were divided into two groups.*

Preposition **on the basis of** could be replaced with **by** and **from**, without any influence on the sentence meaning.

***By/from** their occupation patients were divided into two groups.*

Preposition **with** did not denote company or association in any of the examples from the texts, but in all cases its translation into our language was *sa*. This preposition was mostly connected with the meaning of “having”.

One characteristic found in medical texts regarding realization of prepositions and relations with their complements was the combination (**at**) *risk for* (*heart attack*). Although dictionaries of contemporary English³ do not record the combination of the noun *risk* with preposition **for**, but with prepositions **of** or **at**, in the medical dictionaries and medical texts, as well as in our selected texts, we found combination *risk for* which was far more frequent than the combination (*at*) *the risk of* or *at risk* (12). Regardless of the selected preposition in the mentioned combinations there was not much influence on the meaning.

Also, in some examples, it was noticed that there were some variations of prepositions within certain phrases which could, but did not have to, lead to change in meaning of the phrase. For instance, after consulting Dorland's medical dictionary and dictionaries of contemporary English⁴ it was found that apart from combination *change of something* there was the combination *change in something* (12). This variation does not influence the meaning and these two prepositions are interchangeable in these cases, however, no other preposition appears in the mentioned combination irrespective of the fact that it is used in the medical professional texts or everyday language use.

It is very difficult to select some of the prepositions and say that they are characteristics of the medical discourse only. In medical texts in English, there can be found some repetitions of certain constructions with prepositions-collocations. For example, when we are speaking about patient's health we can have *change in/of patient state*, or *change in/of drug dosage*, or patient comes to the hospital *due to pain in the chest*, *on the basis of patients state the doctor establishes the diagnosis*, *according to findings*, *the treatment is prescribed*, *in many patients* there are indications and findings that place them in the group *at risk for* certain disease, many diseases and symptoms are *related to* or *associated with* many organs and both patients and diseases can be *divided into* many categories, etc. However, this does not mean that all mentioned examples cannot be found in everyday use of language or other discourses.

CONCLUSION

Prepositions play a significant role in both Serbian and English. Due to the fact that it is not possible to give a universal rule regarding the use of prepositions in English, and the same applies to their use in medical discourse, we hope that it is useful to point out their

specific realizations and use, especially those most commonly encountered.

The main part of this work was based on showing the specific use and realization of prepositions and prepositional phrases in medical texts and after analysis conducted on selected medical texts, we can conclude that some prepositions and prepositional phrases were present (not all of English prepositions) in these types of texts, and simple prepositions were more frequent than complex ones in this discourse. The categories of meaning were also unequally represented. The most frequent categories and prepositions were those regarding temporal and spatial relations.

In the analysis that we conducted in this paper, we have found a number of specific uses and realizations of prepositions and prepositional phrases:

a) the same preposition can appear in multiple categories and express different meanings;

b) all prepositions within one category of meaning cannot be mutually interchanged without affecting meaning or appropriateness of the sentence. Also, this is neither recorded in the dictionaries of contemporary English nor in medical Dorland's dictionary. There are only several examples found where these substitutions can be done. In our paper it was related to some prepositions in the category of cause (**because of** and **due to**), place (**into** and **in**) and in some cases to prepositions **in** and **at** in spatial relations and **by** and **with** used for denoting instrument;

c) some prepositions in some cases can be literally translated into our language, for example: *in-u*, *on-na*, *from-iz*, etc. For some prepositions this is not possible due to the fact that they can be translated differently depending on the context or they are not translated at all. For these reasons, literal translations can lead to improper use;

d) a number of prepositions in selected medical texts were used for single or multiple relations and meanings but that does not mean that these were the only meanings that a certain preposition can cover;

e) it is necessary to point out that a certain number of prepositions that can be considered as frequent or commonly found prepositions in contemporary English were not present in the texts that served as a corpus for analysis in this paper.

³Several dictionaries were consulted.

⁴Used dictionaries were: Essential English Dictionary, Kostic's Medical dictionary, Advanced Learner's Dictionary, and internet dictionaries Eudict, Metak

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REALIZACIJE PREPOZICIJA I PREPOZICIJSKIH FRAZA U STRUČNIM MEDICINSKIM TEKSTOVIMA NA ENGLESKOM JEZIKU

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Sažetak

Prepozicije i prepozicijske fraze su segmenti koji u stručnom medicinskom registru na engleskom jeziku zauzimaju vidno mjesto jer su veoma zastupljeni. Realizacije prepozicija u medicinskim tekstovima mogu predstavljati poteškoće neizvornim govornicima engleskog jezika prilikom njihove upotrebe.

Predmet istraživanja ovog rada je prepozicija sa svojim značenjima (jednostrukim i višestrukim). Prepozicija se ne može javljati samostalno i stoga smo je uzimali zajedno sa svojim prepozicijskim komplementom sa kojim zatvara prepozicijsku frazu. U radu se nismo bavili funkcijom prepozicijskih fraza unutar drugih struktura (fraza ili klauza), nego samo internim odnosom prepozicije i njenog komplementa i to posebno značenjem prepozicija u prepozicijskim sintagmama u medicinskom registru.

Ključne riječi: prepozicija, prepoziciona fraza, medicinski diskurs