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КОНТЕКСТУАЛЬНАЯ И СЕМАНТИЧЕСКАЯ СПЕЦИФИКА МЕДИЦИНСКОЙ ХИРУРГИЧЕСКОЙ ТЕРМИНОЛОГИИ В АНГЛИЙСКОМ ЯЗЫКЕ

В последнее время исследователи всё чаще обращаются к изучению и систематизации медицинской терминологии в рамках вариативных лингвистических направлений. Неотъемлемой частью медицины являются хирургические вмешательства. В данной работе предпринята попытка заполнить исследовательскую нишу семантического, лексического и дистрибутивного анализа медицинской хирургической терминологии в английском языке. Целью исследования является выявление лексико-семантической специфики медицинской терминологии на основе текстов клинических случаев ведения пациентов из телесериала «Хороший доктор» (2017). Новизна исследования заключается в применении онлайн- и офлайн-инструментов для обработки текста, комбинации подходов к изучению текста и словосочетаний. Исследование реализовано в четыре этапа. На начальном этапе установлено, что наиболее частотными являются номинации, принадлежащие тематическими группам «Хирургические вмешательства» и «Жизненно важные функции». Структурная классификация терминов позволила заключить, что номинации хирургических вмешательств репрезентированы преимущественно глагольными словосочетаниями, а номинации жизненных функций – именными. Гиперо-гипонимические отношения терминологических единиц демонстрируют превалирование гиперонимов «неотложное состояние» и «оборудование». В ходе исследования были выявлены ядерные семы, общие для анализируемых единиц, номинирующих ход операции, а именно семы «увеличивать», «уменьшать», «соединять» и «удалять». На заключительном этапе авторы изучили контекстуальное использование и сочетания с наиболее частотными глаголами рассмотренных случаев ведения пациентов в текстах Руководства для хирургов (2013). Распределение изучаемых глагольных терминов в данном корпусе по линиям соответствия в анализаторе текста AntCop выявило сочетания единиц с предметами, тканями и органами человека.

Ключевые слова: медицинская терминология, семантика, линии соответствия, словосочетания, контекст.



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CONTEXTUAL AND SEMANTIC SPECIFICS OF ENGLISH MEDICAL SURGICAL TERMINOLOGY

Recently, the researchers have dived deeply into study of medical terminology within various linguistic domains. The surgical interventions are regarded as a part and parcel of medical practice. The work attempts to fill in the research niche requiring semantic, lexical and distributional analysis of the medical surgical terminology in English. The research aims at revealing lexical and semantic specifics of the medical terminology based on the texts of patients' management retrieved from 'the Good doctor' TV series (2017). The research novelty lies in the application of the online and offline tools for text processing and multiple approaches followed to study the text and the word combinations. The research comprises four stages. The preliminary stage reveals that the most prevalent nominations elicited fall into 'the surgical interventions' and 'the vital functions'. The structural classification of the terms shows that the nominations of the surgical interventions are, mostly, verbal word combinations and the vital functions are expressed by nominal ones. The most frequent hyperonyms 'the urgent medical condition' and 'the equipment' comprise a set of numerous hyponyms. Semantic features shared by the analysed units nominating surgery involve the core semes "to increase", "to decrease", "to connect", and "to remove". The final stage of the research implied the contextual distribution and word combinations of the verbal medical terms in patients' management and Handbook of clinical surgery (2013). The concordance lines structured for the verbal phrases exhibit collocations with the items, human tissues and organs.

Keywords: *medical terminology, semantics, concordance lines, collocations, context.*

Introduction

Medical terminology has been researched in many domains in linguistics [1–3]. Of particular interest to this work are semantic and contextual studies of medical linguistic units [4–6]. The medical terminology constitutes the core, or codified part, of the professional language, whereas the periphery is formed by the uncoded units, i.e. professional jargonisms [7]. The research consistency with the predominant anthropocentric linguistic paradigm, the use of online tools for text analysis makes the research relevant.

The tasks of the research comprise the following: 1) to elicit the medicine-related units (hereinafter MRUs) from the TV episodes 'the Good doctor' (2017); 2) to perform thematic classification of the MRUs; 3) to reveal hyperonyms and hyponyms of the units; 4) to group terminological word combinations according to their structural types; 5) to reveal the semes common for the MRUs and group them accordingly; 6) to perform distributional analysis of the MRUs and determine possible word collocations based on the surgical texts.

The research comprised 4 stages, accorded with the following research questions (RQ):

RQ1: What topic groups the MRUs constitute?

RQ2: What are the structural types of the MRUs?

RQ3: What common semantic features are revealed in the surgical terminology?

RQ4: What are possible collocations with the MRUs?

Materials and methods

The material of the study consists of 116 MRUs registered in the corpus compiled by the authors.

The source of the material is the TV series ‘Good doctor’ (2017). The series comprise 6 seasons and tell about a young surgeon with autism and savant syndrome, who relocates from a quiet country life to join a prestigious hospital's surgical unit. Alone in the world and unable to connect with those around him, the young surgeon uses his extraordinary medical gifts to save lives and challenge the skepticism of his colleagues.

For the purposes of the research we applied to the Episodes 3 and 4, Season 1. Each episode is structuralized in 2 patient cases. Thus we consider 4 cases, primarily surgical. Patient 1 of the Episode 3 suffers from severe cirrhosis, complicated with portal hypertension and variceal bleed, so he needs the liver transplantation. Patient 2 undergoes an operation on his mandible. In Episode 4 the focus is on the 36-year-old, 22-weeks-pregnant woman with the tumor on a fetus’ tailbone. Moreover she has got the antiphospholipid syndrome and a girl with the abscess.

The research works on the semantics, structural grammar and contextual studies constitute the theoretical background of the study. Structural approach is generally accepted and applied in linguistics to study the semantics of words, and terms, in particular [8, 9].

Traditionally, the meaning of a linguistic unit comprises two mega components, i.e. lexical and structural [9]. The lexical meaning of linguistic units is viewed as a codified reflection of an extralinguistic environment. The structural meaning deals with the functional aspects of a unit [9].

The semantic structure of a language unit as “a product of human thought is connected with compression of information by human mind, with the mechanisms of categorization presupposing comparison, classification, generalization” [10].

The syntactic context is defined by Amosova N.N. as the context in which ‘the indicative power belongs to the syntactic pattern and not to the words which make it up’ [11]. The notion of an “immediate context” is unveiled in the works of Sperber and Wilson and denoted “any context which is most accessible at a given point in the utterance interpretation process” [12].

Semantic analysis of the elicited MRUs in the medical discourse is also based on the distributional hypothesis that suggests that “words that occur in the same contexts tend to have similar meanings” thus (aspects of the) meaning of words can be induced from texts [13].

The practical value of the research lies in the application of the obtained results to the lecture courses of Lexicology, Semantics and English for Specific purposes. The algorithm of the lexical and semantic analysis developed by the authors may further be applied to other topic groups of the linguistic units, both terminological and basic English ones. The research results may also be used to compile dictionary entries of the MRUs as well as the medical thesauruses.

Results and discussion

The research was organised in four stages. At the preliminary stage the MRUs were elicited from the TV series text of patient management.

At Stage I the MRUs were classified into six topic groups, namely, “the Vital functions”, “the Stages / description of a surgical intervention”, “the Surgical equipment”, “the Symptoms / condition”, “the Triggers”, and “Comorbid conditions” (Fig. 1).

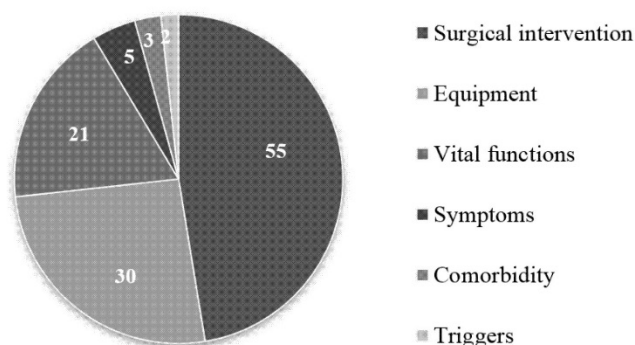


Fig. 1. The distribution of the thematic groups of MRUs

The prevalence of the MRUs, pertaining to the topic groups “the Surgical intervention” (55), “the Equipment” (30), and “the Vital functions” (21) seems obvious as the texts under study focused, primarily, on the surgical patients and the manipulations performed in the theatre.

Further on the MRUs were described in terms of hyperonyms and hyponyms. We shall exemplify the description based on two most prevalent thematic groups, namely, “the Surgical intervention” and “the Vital functions”.

The hyperonym “medical conditions of emergency” comprises the following hyponyms: a variceal bleed, portal hypertension. E.g. “*He’s got a variceal bleed*” [14].

The hyperonym “medical assessment indicators” comprises such hyponyms as the temperature, the blood pressure, the heart rate, the central venous pressure, the oxygen tension. E.g. “*Central venous pressure is good*” [14].

‘The equipment’ is specified by the following hyponyms: a suture (4-0 Vicril, 10-0 polypropylene), loops, vascular forceps, sponge, stick, a probe, a retractor, a

speculum, fluoroscope. E.g. “I know this hurts, but I really do need insert a speculum for this part of this exam” [14].

The hyperonym “the surgical intervention” encompasses such hyponyms as to band the vein, to remove the clot, to close smb. up, to drain the abscess, to excise the tumor, insert the drain. E.g. “We have to immediately remove the clot and flush the left lobe to protect it from the ice bat” [14].

At Stage II we performed the structural classification of the one-word MRUs and the word combinations.

The topic group “the Vital functions” comprises 2 one-word MRUs, namely, the adjective *stable* and the Past Participle *decompensated*. The topic group the “Stages of surgical intervention” contains one-word noun *retraction*.

We followed the theories by Arakin V.D. and distinguished between verbal and nominal word combinations, further marked as $A^{n,d} + K^v$, the Adjunct being either in post-position or in pre-position to the Kernel [15].

The topic group the “the Stages of surgical intervention” contains 89 word combinations. In particular, 55 are verbal phrases (62%) (e.g. to remove the tumor, to excise the myoma, cutting into the uterus, to find its source). There are 32 nominal phrases (36%) (e.g. a balloon pump, oxygen saturations, recipient artery, fetal sacrum).

The topic group “the Vital functions” includes 24 word combinations. They fall into 13 nominal word combinations (e.g. venous pressure, wall hypokinesis, oxygen tension, blood pressure), which corresponds to 52%; and 9 verbal phrases (e.g. decreasing function, got a bleed, coming up pressure, dropping rate), which correspond to 39% (Table).

The structural types of the MRUs

Topic group	Verbal phrases ($A^{n,d} + K^v / K^v + A^{n,d}$)		Nominal phrases ($A^a + K^n / K^n + A^a$)	
	#	Example	#	Example
Surgical Intervention	55	remove the tumor, excise the myoma, cutting into the uterus, find its source	32	a balloon pump, oxygen sats, recipient artery, fetal sacrum
Vital functions	9	function is decreasing, got a bleed, pressure’s coming up, rate is dropping	13	venous pressure, wall hypokinesis, oxygen tension, blood pressure

Stage III of the research implied the semantic classification of the units under study performed for two topic groups “the Stages of surgical intervention” and ‘the Vital functions’ due to their high frequency in the corpus compiled.

The topic group “the Stages of surgical intervention” includes the following most frequent semes “to divide”, “to connect” and “to change”. The seme “to divide” is revealed in the words and combinations wide open, to cut, to make incision’ The

seme “to connect” is represented in the phrases to band the vein, an anastomosis, to cannulate, close him up. The seme “to change” is found in the verbs to remove, to replace, to drain.

The topic group “the Vital function” comprises following meaning components of spatial orientation: “to increase”, “to decrease”, “outside”.

Interestingly, the meaning “to increase” may be manifested in given lexical units in a number of ways: as a prefix hyper- (e.g. *hypertension*), as a preposition (e.g. *to go up*), as the word meaning itself (*to rise*).

The same is revealed for the words containing the seme “to decrease”. E.g. *the heart rate is dropping, hypotension*. The seme “outside” is revealed in the MRU *bleeding*.

The normal condition of patients’ vital functions is also reported in the MRUs. Thus, the seme “normal” occurs in such collocations, as *steady blood pressure, heart rate, stable blood pressure, and the pressure is good*.

The results obtained at this stage indicate the prevalence of the quantifying semes marking the rise or fall of vital processes in human body. Moreover, the semes of (dis)connection of a wide variety of items describe the aid patients receive during surgical manipulations implemented via attaching or detaching equipment or body structures.

Stage IV rested on the retrieval of the collocations with the most frequent verbs describing the surgical manipulations, such as *to remove, to replace, to insert, and to clamp*. We researched possible collocations with these verbs based on two sources: (1) the corpus of the TV episodes under study, and (2) the corpus compiled by the authors based on the textbook for medical practitioners, surgeons’ guidebook “Oxford handbook of clinical surgery” (2013) [16].

The collocations were obtained through the AntConc tool [17] (Fig. 2).

The concordance lines generated for the verb *to remove* show 68 hits and the prevalence of the items used during the surgical manipulations (34), such as, *the drain, the syringe, the catheter, the dilator, the needle, the plaster*. Moreover, the nominations of substances to be removed from the human body are also collocates (21). E.g. *remove the adenoma, remove the bowel, remove the cyst*.

The distributional analysis of the word combinations with the verb *to replace* (83 hits) revealed the use of the human organs’ nominations (vein, blood, liver) as well as the surgical items spacer, gel pads, solution, fluid. E.g. “*Replace gel pads with fresh ones*” [16].

116 hits were elicited from the Corpus for the verb “to insert”. Primarily, the word combinations involve draining instruments (*the bladder catheter*), the instruments used to provide the substance inside the body (*the needle, the tube*). E.g. “*A double lumen catheter (Vascath) is inserted into a central vein*”, “*Insert a 12G cannula into the second intercostal space in the mid-clavicular line*” [16].

hyoid bone ('Sistrunk procedure'). Complications These are usually very few.	Remove	the drain the next day and discharge the patient.
that the lung parenchyma has not healed. 2 You can only	remove	the drain when there is no air leak; otherwise
in 'Landmarks' section (see b p. 196). • On aspirating venous blood,	remove	the syringe and needle, but leave the catheter in
it, aspirating until urine is withdrawn. SUPRAPUBIC CATHETERIZATION 213 •	Remove	the syringe and pass the guidewire down the needle
focused neck exploration through a lateral cervical scar, aiming to	remove	the adenoma visualized on scanning and not to explore
involvement, a defunctioning stoma is necessary. • Definitive surgery is to	remove	the aganglionic bowel and bring normally innervated bowel to
is entered. • Withdraw 15–20mL of fluid for a diagnostic evaluation. •	Remove	the aspiration needle carefully and apply an occlusive dressing.
times. • Once an adequate length of wire is in place,	remove	the catheter over the wire, and apply pressure to
Yeates type drain. • Give antibiotics and make no attempt to	remove	the cyst until the infection has resolved completely. Branchial
anterior border of the sternomastoid and retract the muscle posteriorly. •	Remove	the cyst, usually by blunt/sharp dissection. • Use suction
Pass the dilator firmly over the wire into the bladder. •	Remove	the dilator and pass the catheter into the bladder,
the wire through the skin, but not into the vein. •	Remove	the dilators, apply pressure, and pass the CV cannula
tolerates the clamp for 24h, it is usually possible to	remove	the drain. 204 CHAPTER 4 Practical procedures Pericardiocentesis Key facts • Occasional
through a transverse elliptical incision. Again use blunt dissection and	remove	the middle part of the hyoid bone ('Sistrunk procedure').
needle perpendicular to the skin through its full thickness. • Either	remove	the needle through the wound or continue in one
pass the guidewire down the needle into the bladder, then	remove	the needle, holding the guidewire in place. • Pass the
sphincter in the direction of the umbilicus for approximately 5cm. •	Remove	the obturator, attach light source, insufflator, and eyepiece. • Introduce
cure. • The options are as follows: • Radical prostatectomy. Operation to	remove	the prostate and seminal vesicles; complications include incontinence (severe

Fig. 2. The concordance lines of the MRU “remove” generated by the AntConc tool based on the compiled Corpus

The verb *to clamp* functions in 38 contexts of the Corpus. The meaning of the verb predetermines its immediate context, i.e. it collocates with the draining blood vessels. E.g. “<...> *the patient appears haemodynamically compromised as a result of drainage, it is appropriate to clamp the drain for a brief period*” [16].

The collocations revealed for the verbs fall into two big groups: instruments and human tissues. Clearly, both of them are crucial items of the surgical interventions.

Conclusion

Among one of the research findings we may highlight the distribution of the MRUs selected from two episodes of the TV series into seven topic groups which gives a wide variety of the research material. The prevailing topic groups, i.e. “the Vital functions” and “the Surgical interventions” were further described in terms of their meaning and structure. When describing vital functions doctors resort to the nominal phrases more frequently than to verbal ones. However, surgical manipulations are described by verbal phrases.

The most frequent hyperonyms “the urgent medical condition”, “the equipment” and “the surgical intervention” embrace a range of hyponyms of the MRUs. The vast majority of the MRUs registered in the research Corpus share the semes “to increase”, “to decrease”, “to remove”, “to connect”, and “to change”. The prevalence is due to the predominant nominations of the surgical manipulations performed and the detailed description of the procedure.

The immediate context of the MRUs studied via the concordance lines proves the use of the verbal collocations with the surgical items, organs, and tissues.

Further research perspectives lie in the application of the developed algorithms of the semantic, lexical and distributional analysis to the terms of other branches of Medicine as well as other sciences. Moreover, the studied MRUs, their collocations and the contexts may serve as a good means to compile a glossary or a medical thesaurus.

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