

idioms, are extremely important components of linguistics and their classification helps us to study them more precisely. Somatic phraseological units represent a large part of English phraseology and is the reflection of the culture and mentality. Studying of linguistic peculiarities, especially phraseology contributes to our understanding of the collective view of the world in general and recognise the emotional component of the discourse in particular. Turning to the linguistic peculiarities of the newspapers, the usage of the idioms attract readers' attention to information modifying the tone and adding expressiveness.

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*T. D. Gostyunin, M. I. Andreeva, E. A. Anokhina (Kazan)  
Kazan State Medical University*

## **Research articles on cardiology: lexical semantics, synonymy and equivalency in translation**

В статье рассматриваются профессиональные медицинские контексты функционирования профессиональных лексических единиц, отобранных из научных статей по кардиологии и образовательных источников. Рассматривается аспект перевода изучаемых единиц с английского языка на русский. Лексическая семантика, синонимия и эквивалентность при переводе представлены в работе в соответствии с тематическим параметром.

**Ключевые слова:** лексические единицы, терминология, медицина, кардиология, семантика, синонимы, английский язык, русский язык

This article reviews professional medical statements and lexical units elicited from research articles on cardiology and educational resources. Translations from English into Russian were considered. Lexical semantics, synonymy and equivalency in translation follow specific pattern of arrangement.

**Key words:** lexical units, terminology, medicine, cardiology, semantics, synonyms, English, Russian

That is well-known fact that English is a global language. This is also true for world science. Undoubtedly, the vast majority of research papers are published in English. This circumstance creates a serious problem for researchers who do not speak English. Hence international research papers require translations. But it is essential to understand that translations must be performed accurately, because many phrases and terminological units may imply different things in different languages [2]. As exemplified by scientific and educational materials on cardiology, we will examine the problems of translations arising in this process. We distribute all the statements and constructions elicited from published articles on cardiology into in 4 groups.

**Material of work:** In the research we used cardiology articles [8], [9], [10], [11], [12] uploaded into medical websites. Some chapters in the Medical English textbooks [4, p. 84-89] and [6, p. 52-55] were also under study. To research more general phrases used in English we followed the popular YouTube channel videos about Medical English [7].

Group (I) involves general phrases in medicine not specifically related only to cardiology taken from video [7]. There are lexical units known and used by any doctor. Being a non-native English speaker, a doctor, unfortunately, is highly likely to make mistakes in the following routine and standard communication patterns. It should be highlighted that most of phrases listed below can also be used within cardiology. For example:

‘The patient always has **presenting** symptoms (i.e. those which brought the patient to the appointment). The patient doesn’t show or tell about his disease’

‘The pain always **radiates to** some part of the body. It will be the most correct variant describing pain course. The most popular synonyms of radiate word are more suitable for other vocabularies’. As alternative to radiate word ‘**go**’ is more commonly used to refer the movement of somebody living, that word also is defined as a travel to somewhere or come to (OED).

Obviously, the patient’s health sometimes **gets worse**. Here we use non-typical in an informal style and daily communication word – **deterioration**. Synonyms include the following: ‘**degradation**, 1. *the condition or process of degrad-*

ing or being degraded, 2. a trail of human misery and degradation; 3. geol. the wearing down of rock by disintegration (OED).

The specific collocation is used when referring to symptoms' manifestation. For example, medical discourse provides the following context: 'Patient **exhibits** the drawer sign' (a symptom of pull out drawer in Russian). We might consider a number of synonyms: *manifests*, *demonstrates* etc.

Group (II) 'Basic words and phrases in cardiology' involves a number of terminological units. We decided to use following structure for words and phrases listed below: 1. Unit; 2. Definition; 3. meaning in Russian; 4. Comment [1].

1. **Pulmonary circulation**; 2. The pulmonary circulation is the portion of the circulatory system which carries deoxygenated blood away from the right ventricle of the heart, to the lungs, and returns oxygenated blood to the left atrium and ventricle of the heart; 3. *Малый круг кровообращения*; 4. It is important to learn that this part of the WHS is called *pulmonary*, and not *small*.

2. **Somatic/systemic circulation**; 2. The Circulatory system is an organ system consisting of the heart, blood, and blood vessels, that helps maintain homeostasis and transport life-giving oxygen, nutrition, and hormones to cells throughout the body and toxic waste products away; 3. *Большой круг кровообращения*; 4. That is the most correct variant instead of *big* or *large* circulation.

We also have a lot of synonyms and meanings of a **heart failure** you can find in cardiology articles:

**heart failure**, *syn.*, 1. *circulatory collapse*, 2. *cardiac decompensation*, 3. *cardiac failure*, 4. *failing heart*, 5. *cardiac insufficiency*, 6. *heart weakness (MULT)*. ● 'More than 1,750 people die of sudden **cardiac arrests** every week in the UK, the highest rate in Europe' (OED).

We have checked the frequency of use of the above synonyms in various sources using the Google Books Ngram Viewer tool.

As we can see on the table below, the most common variation is '*heart failure*'. We considered it is important to give an example of this expression from the Oxford dictionary. 'Her mother had died of **heart failure**' (OED).

Table 1

**Word-usage frequency of *heart failure* synonyms for 2008 calculated  
by N-gram viewer**

Term	Frequency, %
Heart failure	0,0004555820
Cardiac failure	0,0000289392
Failing heart	0,0000060440
Circulatory collapse	0,0000051908
Cardiac insufficiency	0,0000023954
Cardiac decompensation	0,0000021336
Heart weakness	0,0000005355

There are also lots of synonyms of words and phrases describing the human blood. Clearly, human blood has oxygen associated with erythrocyte, we should use the following synonyms: *oxygenic, oxygen-rich, oxygenated, enriched oxygen*. As we can see on the table below, the most common variation is ‘*oxygenated*’. So we also need to consider an example to understand that meaning better. For example, ‘*This suggests the hematite crystals are not oxidation products of siderite, because pyrite is easily altered to goethite under an **oxygenated** atmosphere*’ (CED).

Table 2

**Word-usage frequency of *oxygenated* synonyms for 2008 calculated  
by N-gram viewer**

<i>Term</i>	<i>Frequency, %</i>
Oxygenated	0,0000572808
Oxygen-rich	0,0000091887
Oxygenic	0,0000057087
Enriched oxygen	0,0000002906

The human blood doesn’t have oxygen associated with erythrocyte, we should use another synonyms: *oxygen-depleted, oxygen-deficient, underoxidized, anoxia, hypoxia, scarcity of oxygen*. Example sentence of most common term, ‘***Hypoxia** can result in an increase in the production of erythropoietin*’ (CED).

**Word-usage frequency of *hypoxia* synonyms for 2008 calculated  
by N-gram viewer**

<i>Term</i>	<i>Frequency, %</i>
Hypoxia	0,0001971585
Anoxia	0,0000285368
Oxygen-deficient	0,0000020701
Oxygen-depleted	0,0000016427
Scarcity of oxygen	0,0000000981
Underoxidized	0,0000000250

Group (III) A number of phrases are not found to be full or partial equivalents in translation from English into Russian. Typically, they are used during patients' examination by cardiologist.

We decided to divide all the terms into three subgroups with the following structure: 1. Term; 2. Definition in English; 3. The comment to the definition; 4. Example from article; 5. Definition in Russian.

1) Thematic group 'Symptoms' contains 2 units:

1. 1. **Friction rubs**; 2. An audible medical sign used in the diagnosis of pericarditis due to friction of the heart walls; 3. Upon auscultation, this sign is an extra heart sound of to-and-fro character, typically with three components, ONE systolic and TWO diastolic; 4. «*By the time of his hospital discharge on day 6, his exam revealed a pericardial **friction rub***»; 5. Шум от трения.

2. 1. **Claudication**; 2. Claudication is a medical term usually referring to impairment in walking, or pain, discomfort, numbness, or tiredness in the legs that occurs during walking or standing and is relieved by rest (WIKI); 3. That definition uses in a lot of medical spheres, but namely in cardiology it means the dynamical blood circulation impairment; 4. «*Patients with intermittent **claudication**, following a supervised exercise program, were recruited from private physiotherapy practices in the Southern part of the Netherlands*»; 5. Хромота.

2) Thematic group «Vital signs of patients' condition» is composed of 3 units:

1. 1. **Premature beat** – as known as premature ventricular contraction (PVC); 2. Premature beat is a relatively common event where the heartbeat is initiated by Purkinje fibers in the ventricles rather than by the sinoatrial node, the normal heartbeat initiator (WIKI); 3. It also can be called extrasystole (MULT). That is a truly difficult term because it can be translated like {преждевременный удар} in Russian. It is not correct enough, because this word {удар} can be as-

sumed in Russian as a word means something of a blood stroke. 4. «*To date, there are no reports of a double ventricular response in dual AV nodal pathways that resemble an interpolated premature beat*»; 5. Экстрасистола.

2. 1. **Cognition of the executive function**; 2. Cognition of the executive function – is an awareness or comprehension of the ability to focus on purposeful activities; 3. In MULT we have definitions of «executive function» such as a function of executive system – phrase usually used in the computational vocabulary. However authors sometimes use that phrase to describe portion of human nervous system taken responsibility for making actions or decisions; 4. «*Cognition of the executive function and praxis will be evaluated using the Clock Drawing Test*»; 5. Осознание способности сосредоточиться на целенаправленной деятельности.

3. 1. **Frontal functions**; 2. Frontal functions – functions of frontal lobe as known as an executive functions, because frontal lobe fulfils that functions. 3. This phrase connected with above Cognition of the executive function. 4. «*Cognitive impairment after stroke is characterized by disturbance of frontal or executive function, however, several previous studies also indicated that clinical stroke causes subsequent poorer performance in multiple cognitive domains including memory*». 5. Функции лобной доли головного мозга, также известные как функции исполнительной системы – системы, отвечающей за способность использовать навыки и знания, организовывать деятельность для достижения поставленной цели.

3) Thematic group «Findings of medical research and examination» consists of the following:

1. 1. **A general cognitive performance battery**; 2. A general cognitive performance battery - some group of study results manifesting the signs of patient's cognitive condition; 3. When translating, there may be a problem with the correct interpretation of the word *battery*, since in this case it means a row or a group; 4. «*A general cognitive performance battery will be evaluated using the Alzheimer's Disease Assessment Scale-Cognitive*»; 5. Часть результатов исследования, демонстрирующая признаки когнитивного состояния пациента.

2. 1. **Mild to moderate**; 2. Showing the severity of a particular symptom in a patient; 3. This phrase also means the diapason of pathologic behavior; 4. «*ADAS-cog is a quantitative instrument designed to assess the severity of cognitive impairment over time in Alzheimer's disease patients, but it still is widely used for the cognitive assessment in mild to moderate vascular dementia*». 5. Легкой-умеренной степени тяжести.

3. 1. **The longitudinal functional outcome**; 2. The longitudinal functional outcome – means the result of a long study of certain functions of the patient;

3. The main problem in the translation of this phrase arises from the fact that in most medical literature the word longitudinal is perceived as extensional, and in this case it means namely longstanding; 4. «**The longitudinal functional outcome will be evaluated using the Ability of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL)**». 5. Результат длительного изучения определенных функций пациента.

4. 1. **Odds ratio**; 2. It shows how many patients can get a certain clinical outcome in treatment group compared with placebo group; 3. One of the main expressions that is actively used in research, reflecting a very important statistical parameter; 4. «*Multiple logistic analyses revealed that male sex (**odds ratio** [OR] 3.07, 95% confidence interval [95% CI] 1.12-8.42), left-side infarcts (OR 3.14, 95% CI 1.37-7.20), and basal ganglia/internal capsule infarcts (OR 4.53, 95% CI 1.55-13.22) were associated with MI after adjusting other demographic variables, vascular risk factors, and subtypes of stroke.*»; 5. Количество пациентов, которые могут получить определенный клинический результат в группе лечения по сравнению с группой плацебо. Отношение шансов на клинический результат основной группы к шансам группы плацебо.

5. 1. **Imaging results**; 2. Imaging results – results of visualization by means of use of technologies to research anatomy and capacity of human organs by means of x-ray, NMR, CT and ultrasound; 3. When translating a problem may arise related to the interpretation of the word *imaging*. It is important to understand that in this case it represents the visualization; 4. «*...**imaging results** suggest cerebrovascular disease; a temporal relationship exists between the stroke and the cognitive symptoms.*»; 5. Результаты визуализации с использованием технологий для исследования строения и способности органов человека с помощью рентгеновских лучей, ЯМР, КТ и ультразвука.

6. 1. **Follow-up rate**; 2. Follow-up rate – patients' number under observation at the end of some study check point; 3. In other words, in each study there are certain stages, at the end of which the number of patients who satisfy or do not satisfy the tasks of this stage is recorded; 4. «***The follow-up rate** with K-VCIHS-NP of patients in prospective acute stroke cohort was 69.8% among 506 patients who were followed-up at 3 months after stroke in this study (56.9% among baseline 620 patients) and the proportion of cognitive assessing was somewhat low compared to the previous studies*»; 5. Число пациентов, находящихся под наблюдением в конце некоторого этапа исследования.

7. 1. **Prospective cohort**; 2. Prospective cohort – observed group of patients having the role to get defined clinical outcome; 3. This refers to the group participating in the prospective cohort study. This term refers to a study in which the

group is currently formed, and research methods do not rely on materials obtained in the past; 4. «*Cognitive impairment evaluated with Vascular Cognitive Impairment Harmonization Standards in a multicenter **prospective** stroke cohort in Korea*»; 5. Наблюдаемая группа пациентов, направленная на получение определенного клинического результата в ходе исследования, не опирающегося на материал, полученный в прошлом (анализ данных в истории болезни и т.п.)

8. 1. **Temporal evidence**; 2. Temporal evidence – is a temporary symptom; 3. The problem arises from the fact that the word is most often understood as averment. But in medical vocabulary, it means a symptom; 4. «*VaMCI was defined as impairment in at least 1 of 4 cognitive domains, combined with normal or mild impairments in daily living activities and **temporal evidence** of vascular causation.*»; 5. Временный симптом.

9. 1. **Cognitive assessing**; 2. Cognitive assessing – is a comprehensive analysis and assessment of cognitive abilities; 3. Since the phrase does not indicate that it is the cognitive functions that are assessed, the statement can be understood as an independent assessment by the patient of something by means of his own cognitive processes; 4. «*...and the proportion of **cognitive assessing** was somewhat low compared to the previous studies*»; 5. Комплексный анализ и оценка когнитивных способностей пациента.

Group (IV) ‘The phrases we don’t use in this way in actual life’ involves 2 units.

We decided to use another structure below: 1. Term; 2. Explanation/definition in dictionary; 3. Dictionary meaning in Russian; 4. Sample from dictionary; 5. Sample related to the medical vocabulary.

1. **Empty into**; 2. If a river *empties into* a larger area of water, the water from it flows into that larger area (CED); 3. Впадать, переливать, пересыпать (MULT); 4. The River Tees *empties* into the North Sea; 5. The small vessel empty into the big vessel.

2. **Take place**; 2. To happen, occur (CED); 3. Случаться, происходить, протекать (MULT) - meaning that allows you to use this word in medical vocabulary; 4. The story takes place in the 18th century; 5. The blood takes place in lungs in lesser circulatory system.

Each lexical group possesses its own peculiarities and follows certain rules [3, 5]. When translating medical literature, it is very important to study the features of the translation of certain phrases, refer to different dictionaries for translation equivalents, and compare the meaning of phrases with the original context. Semantics and lexical synonymy are proved to be linguistic features contributing to the appropriate and efficient translation.



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### **Abbreviations:**

- OED – Oxford English Dictionary
- CED – Cambridge English Dictionary
- MULT – Multitran dictionary
- MET – Medical English Textbook
- WIKI – Wikipedia