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The Study of Cardiological Terminology-related Difficulties and Problems in Medical Translation. The book " أمراض القلب وشراييه التاجية" , in English *" Heart diseases and its coronary artery"*, written by Aymen Abu El Magd as a case study.

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Table of contents

Dedication

Acknowledgment

General introduction

Introduction ……..……...1

Chapter I: Medical text and cardiology

Introduction ……....4

1-What is a medical text? ……...……...…….....4

2-The importance of medical language …….....4

Medical language and its characteristics ……..…….....5

3-1- Clarity ……..……..5
3-2- Objectivity ……..….....5
3-3- Accuracy ……..……..5
3-4- Conciseness ……..……..6
3-5- **An outline of cardiology**……..……...6
3-6- Anatomy of the heart ……..……..6
3-7- Physiology of the heart ……...……..7
3-8- Cardiopathy ……..……...…...…10
3-9- Valvular heart disease……...…10
3-10- Angina ……..…10
3-11- **Medical terminology** ……..…..11
3-12- Elements of medical terminology ….……..……..……11
3-13- Prefixes ……..……..11
3-14- Word root ……...……..……..11
3-15- Combining form ……..……..12
3-16- Suffix ……..……..……..12
3-17- **Word analysis** ……..……..……..13
3-18- Derivation ...……..……..14
5-1- Pronunciation and spellings ……...……14
3-19- Abbreviation ……...……..……..16
3-20- Symbols ……..……..……..16
3-21- **Conclusion** ……..……..……..17

Chapter II: Medical translation

3-1- **Introduction** ……..……..17
3-2- **Medical translation**……. ……..……..17
1-2- The importance of medical translation ……17
1-3- How to translate a medical text?.....18

2- Vinay and Darbelnet's techniques of translation ……..……..19

2-1- Direct/literal translation procedures ……....19

2-1-1- Borrowing ……19

2-1-2- Calque ……..…19

2-1-3- Literal translation ……..20

2-2-1 Oblique/free translation procedures ……..20

2-2-1- Transposition ……20

2-2-2- Modulation ……..……20

2-2-3- Equivalent ……...……20

2-2-4- Adaptation ……...……20

3- Translation of medical abbreviations, acronyms and eponymous ...23

3-1- Definition of medical abbreviation ……....23

3-2- Definition of medical acronyms ……23

3-3- Definition of medical eponymous ……24

3-4- Punctuation and spelling ……25

4- Problems in translating medical terms into Arabic ……...26

4-1- Abbreviation as the most common medical translation problem ……26

4-2- False friends ……27

5- Medical translation demands accuracy ……...……27

Conclusion …….……27

Chapter III: Commented translations of some cardiological terms

Introduction ……..……..…29

1- Presentation of the corpus ……29

1-1- The author's biography **……30**

2- Selected examples and analysis ……...……31

2-1- Literal translation ……..31

2-2- Equivalent **…….……36**

2-3- Transposition ……...…….40

2-4- Modulation **……43 Conclusion ……...…….……46**

General conclusion

Conclusion …….……...……46

Bibliography ……...……..48

Glossary ……..…….…….I

Appendix ……..……..…….II

Summary

DEDICATION

This work is dedicated to the memory of my dearest person, my father. My first teacher, whose presence brought life to everything. The person whose words of encouragement are still in my memory.

I dedicate this work also to my lovely precious Mother, the symbol of persistence, to my brother and his family (Dalila, Cerine & Nesrine) and my friends.

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I am heartily thankful to my supervisor, Dr. KHERROUB, *whose encouragement, guidance and patience from the initial to the end enabled me to carry out this research.*

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General introduction

Introduction

Translation is considered as one of the crucial human activities. Thus, it enables people to understand different aspects such as culture, history and religion. Translation contributes in the development of many societies due to the knowledge exchange in different fields. Therefore, no one can deny the contribution of translation in the field of technology and science. The need for translation has grown so fast, as a result of increasing demand for the dissemination of the information, especially in medicine. Medical terminology is a specialized language used by healthcare practitioners and it is one of the difficulties faced by medical translators when they translate a specialized text. A specialized text is a product of a language for specific purposes. Thus, translators must acquire specialized knowledge and also master the techniques of translation, research and documentation, to produce a better translation.

Medicine has always held a special position because it deals with the life, body and personality, of human beings. This is probably the reason why medical translation belongs to one of the oldest fields of translation. It has always been of major importance within the field. Translators should be familiarized by Greek and Latin terminology to be able to translate a medical text, as these terminologies will help them to translate. Medicine requires a high level of accuracy. Hence, translators must have a wide knowledge about the methods of translation as well as medical terminology. Translators are required even in hospitals not only in translating medical articles. For instance, people who do not share the same native language are looking for medical translation as a medium of communication between patients and doctors. The mastery of medical terminology and the accuracy can make a huge effect. They can also be the difference that lead the translators successfully to their objective or to put them away from it. Moreover, any translator must have knowledge about the target audience's language and culture because some aspects in the translator's language or culture may not exist in the audience's ones, so the translator must find a way to deliver the message or the content in an understandable clear way.

The reasons and motivations that pushed us to choose this phenomenon is the fact that cardiology is one of the most important specialty in medicine. Moreover, coronary artery disease is common all over the western world and it is an increasing health problem in developing countries such as Algeria. However, there is not enough studies dealt with medical translation on cardiology. The aim of our paper is to study the features of medical terminology-related difficulties and problems in medical translation, especially when we have two languages extremely different such as Arabic and English. Special attention is also given

to investigating some basic procedures applicable in translating them. The Material for the study is selected from an Egyptian book written in Arabic language "أمراض القلب وشراينه التاجية" by Aymen Abu El Magd .The main raisons which lead us to choose this topic and corpus are the fact that the author in this book deals with heart diseases using a simple language to enable lay readers to understand how our heart works and the different heart diseases. Therefore, medical terminology on cardiology is available in this book. In addition, as far as we know, the selected book was not translated into English language. That is why we would like to present our personal translation to some passages extracted from the book in order to spotlight the medical terms used in Arabic and their equivalent in English. Thus, this process allows us to get at least a slight idea about Arabic medical terms. Where are they come from and also the problems appeared during their translation.

In this research, we will try to answer the main question and the other sub-questions:

- What are the convicting techniques used in translating medical terminology?
- How to translate medical terminology from Arabic to English?
- What are the difficulties that emerge throughout the translation of medical text?
- What is medical terminology?

The hypotheses that we may suggest for the asked problematic and sub-questions are:

- Comparative stylistics strategies could be useful in translating medical terms.
- Scientific translation may be based on important characteristics, clarity, objectivity, accuracy and conciseness.
- Literal translation may be the most useful strategy for translating medical terms.
- Understanding the meaning and the elements of medical terms may help translator to solve the problem of translating medical terms which contain different parts of a word.

In order to achieve an appropriate translation of medical terminology, we will have to proceed with comparative stylistics strategies. In order to answer our research questions above mentioned, we have divided our dissertation into three chapters.

The first two chapters are theoretical, the third one is practical. Starting with the first chapter which is entitled ‘Medical text and cardiology’, it aims at providing a general definition of the medical text and mentioning the importance of medical language and its characteristics. The next point is to give an outline of cardiology, this step is followed by talking about the anatomy and the physiology of the heart. Then we defined medical

terminology and also we mentioned its elements. To clarify them, we dealt with word analysis which plays an important role in medical terminology.

The second chapter is named ‘Medical translation’ and it is a general definition of medical translation and its importance, then we explained how to translate a medical text. In addition, we defined Vinay and Darbelnet’s methods and techniques of translation, then we dealt with the translation of medical abbreviation, acronyms and eponymous and their definitions, after that we dealt with the problems in translating medical terms into Arabic. Finally, we explained how accuracy is important in medical translation.

The third chapter named ‘Commented translation of cardiological terms’ is centered on our attempt to translate some passages extracted from the corpus entitled "أمراض القلب و شرايينه التاجية". we tried via this chapter to give a presentation of our corpus then we dealt with the author’s biography . After that, we analyzed some examples carefully selected from the corpus where we shed light on the analysis method we have followed. Furthermore, we focused our attention on presenting our analytical study of the translation. At the end of the chapter, we introduced some remarks in relation to the author’s translation of some important medical words from Arabic into English as additional information. The three chapters are followed by a general conclusion that will sum up all what have been discussed in the previous chapters.

During our study, we faced difficulties and there were negative points and positive ones. On one hand, the lack of Arabic medical references was one major problem. On the other hand, there were availability of English references, articles or researches about our topic chosen. For instance, the electronic medical dictionary by Farlex was so useful for us while we were dealing with medical translation. In addition, ‘*Family Doctor Books’* published with association with ‘*The British Medical Association’* (BMA) such as, “*Angina & Heart attacks”* written by Dr. Chris DAVIDSON, “*Understanding your heart and the causes of heart disease ”* and *“ Coperative stylistics of French and English”* written by VINAY, J.P. & J. DARBELNET.

At the end, we hope that our dissertation will be a kind of help for other students who wish to deal with the translation of medical terminology on cardiology to accomplish their work.

Chapter one

Medical text and cardiology

Every scientific branch has its own scientific language, for instance the language of medicine. Scientific languages are considered as an expansion of natural language, with the additional of technical terms. Medical language belongs to this category. Therefore, medical texts are hard to translate.

1- What is a medical text?

We define medical text as a text contains technical language, used by experts in mutual communication. The language used by healthcare practitioners. Medical texts have their own vocabulary and they are used to describe diseases, symptoms, anatomy, treatment and physiology. "The expressiveness and flexibility of natural language make it hard to process in a methodological fashion, and researchers generally understand 'technical text' to mean writing which is more tractable because, for example, it lacks figurative language and can be understood in its literal sense." (http://citeseerx.ist.psu.edu visited on 08/02/2019)

Health literacy is important for people to maintain good health and manage diseases. Medical educational texts are often written beyond the reading level of the average individual, so they need text simplification to increase readability and, therefore, comprehension.

Specialized medical affix dictionaries for example help the readers to identify the morphological units of a term and their definitions. Medical writers are involved in the process of creating document designs about science and medicine. They work with other medical professionals to help to create or take previously compiled documents and prepare them for a specific audience. Medical writers are the educating phase between a medical innovation and the learning audience. The types of documents that medical writers can prepare are: news articles, web content, books for the general public and Journal.

2- The importance of medical language

Medical terminology is the universal language of medicine. Patients can move from one doctor or hospital to another without finding any problem if medical information is appropriately coded. It is used by healthcare professional to communicate with each other and with their patients and also to describe their conditions accurately. Anyone who works in healthcare is able to read and to interpret the medical terms used in reports.

Medical language is like any foreign language, that is, there are rules which must be applied and memorization plays a significant part in its mastery. Moreover, pronunciation and spelling must also be learned. Significant medical terms can be defined by breaking the term into its component parts, roots, suffixes and prefixes, once you learn these, the meaning of

many words become accessible to you. Learning any new language is a challenging, but an understanding of the basic rules of word building helps to simplify the process and to share accurate information. (http://climb.pcc.edu & https://www.oregon.gov visited on 10/02/2019)

Medical language and its characteristics

Medical language should be precise; each of the specialized word has a specific meaning. Medical text has more complex structures and vocabulary than the fiction or text written for the general public. Its message should still be clear and concise.

The major features of medical writing are; clarity, objectivity, accuracy and conciseness.

3-1- Clarity

Medical document should convey one meaning that a reader can understand. Clarity has to do with the ability of a medical writer to produce documents that are easily understood by the target audience. Such documents must be clear and straight forward. One of the things required of a medical writer is to stick to the subject matter and to relay information in a clear manner. Clarity is one of the single most important aspects of good medical writing. It helps the readers to comprehend the message intended by the writer. Medical writing is expected to convey facts in clear terms and not hazy or ambiguous terms because results must be accomplished.

3-2- Objectivity

This characteristic means that the scientific subject, the most important part, should be viewed objectively and not influenced by the personal feelings. "Ability to view things objectively: the ability to perceive or describe something without the being influenced by personal emotions or prejudices." (www.les-encyclopedies.com visited on 01/11/2019)

3-3- Accuracy

The word accuracy is defined by Microsoft Encarta (2009) as correctness or truthfulness of something. It is further defined as the ability to avoid errors.

The ability of the technical writer to provide information in accordance with accepted standard is a highly priced asset. Inaccurate writing is a major cause of most problems associated with unclear writing. When a given document is inaccurate, it is deemed to be an invalid document which does not command respect and confidence from the readers. Such documents create confusion and may be very dangerous since they hamper the effectiveness of a decision making process. Accuracy is a simple concept which implies that facts and figures must be recorded carefully and with the highest degree of precision.

Accuracy is seen as a matter of ethics. It favors the principle of objectivity and clarity. Above all, it connotes that information provided in a technical document must be free from bias and must be conducted scientifically. In a nutshell, accuracy in technical writing is all about the writer being reasonable, fair and honest.

3-4- Conciseness

The language is direct and straight to the point, avoiding ambiguous words and eloquent writing styles. In order to save time and increase the forcefulness of the writing. Technical Writers must exhibit this skill. Though words and thoughts necessary for effective communication should not be omitted, ideas should be expressed in few words. Short and simple words should be selected, wordy phrases should be reduced and needless words should be omitted.

4- An outline of cardiology

Cardiology is a branch of medicine. It is a rapidly changing field, in recent times technological advance has been ever more rapid. However, for many years ago the heart has not revealed its secrets readily. It was believed the heart was the only organ that could not be cut (heart surgery was unthinkable from the time of Aristotle until the late 1800s). Since the invention of stethoscope, cardiologists have used technology to reveal the innermost workings of the heart and heart diseases. "Cardiology is the study of the heart, its diseases and function." (http://medical-dictionary.thefreedictionary.com visited on 02/11/2019)

4-1- Anatomy of the heart

The heart is the most talked about organ of the human body. It's the center of attraction for people from many lifestyles, such as philosophers, poets, artists and physicians. Understanding anatomy and physiology is very important and challenging.

E. Glendenning and R. Howard (2007) affirm that the heart is a muscle just behind the breastbones (sternum) in the center of the body's circulation system. It weighs about 300 grams. The normal resting heart rate is 65-75 beats per minute, and beats about 100 000 times a day .In athletes it may be as low as 40 beats per minute. In extreme athletic activity, the rate can go as high as 200 beats per minute. Each heartbeat pumps blood to all the parts of the body. The heart beat may be regular or irregular. "The heart is a muscular pump in the chest that is constantly working, pumping blood around your body day and night, from cradle to

grave. It contrasts and relaxes 100 000 times a day, and so needs a good supply of its own-one provided by the coronary arteries." (Davison, 2010:10)

4-2- Physiology of the heart

The body has about 113 000 kilometers of blood vessels, called arteries, they carry blood rich in oxygen from the heart to the body. They get smaller as they get further from the heart. Capillaries are the smallest of blood vessels. They connect the smallest arteries to the smallest veins. This is where oxygen, carbon dioxide, nutrients and waste products are exchanged. The body removes the oxygen in order to use it. Veins carry back blood to the heart and lungs to get more oxygen. "The basic function of the heart is to pump red blood supply, which is rich in oxygen and nutrient, through large arteries to the rest of the body. When the oxygen has been taken up by muscles and other tissues, veins carry the blood (now blue and deoxygenated) back to the heart." (Davidson,2010:12)

The heart is divided into four chambers with muscular thick walls. The left and the right atria are small. The ventricles located under the left and the right atria; however, they are larger thick-walled chambers that perform most of the work. "The pumping action of the four chambers is coordinated by electrical signals telling the heart when to contract and relax"

(https://www.chss.org.uk visited on 14/06/2019)

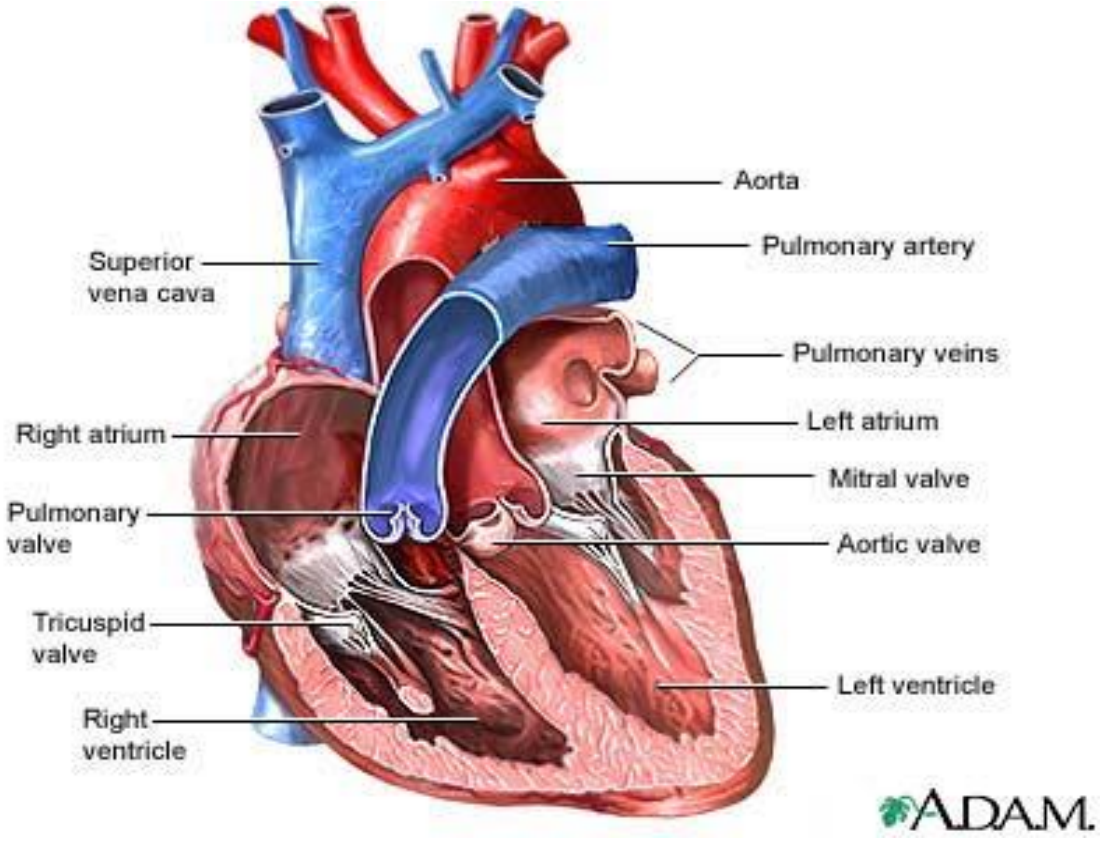

Figure 01: cardiac chambers and valves.

(https://msu.edu visited on 29/06/2019)

The atria receive blood from the nervous system and the lungs then contract and eject the blood into ventricles. The latter pump the blood throughout the body or into the lungs.

A series of four valves, aortic, mitral (bicuspid), tricuspid, and pulmonary, keep the blood moving in the right direction (when working properly) and prevent backward flow. Blood kept moving in a forward direction by one- way valves. The valve in septum between the right atrium and ventricle is the tricuspid valve (meaning three cusps or flaps); the valve in the septum between the left atrium and ventricle is the bicuspid valve (meaning two cusps), usually called the mitral valve (so named because it resembles a bishop's mitre). The valves leading into the pulmonary artery and the aorta have three cusps. Each cusp is shaped like a half moon, so these valves are described as semilunar valves. The valves at the entrance to the pulmonary is specially named pulmonic valve; the valve at the entrance to the aorta is the aortic valve.

The heart sounds are produced as the heart functions. The loudest of these are produced by alternate closing of the valves.

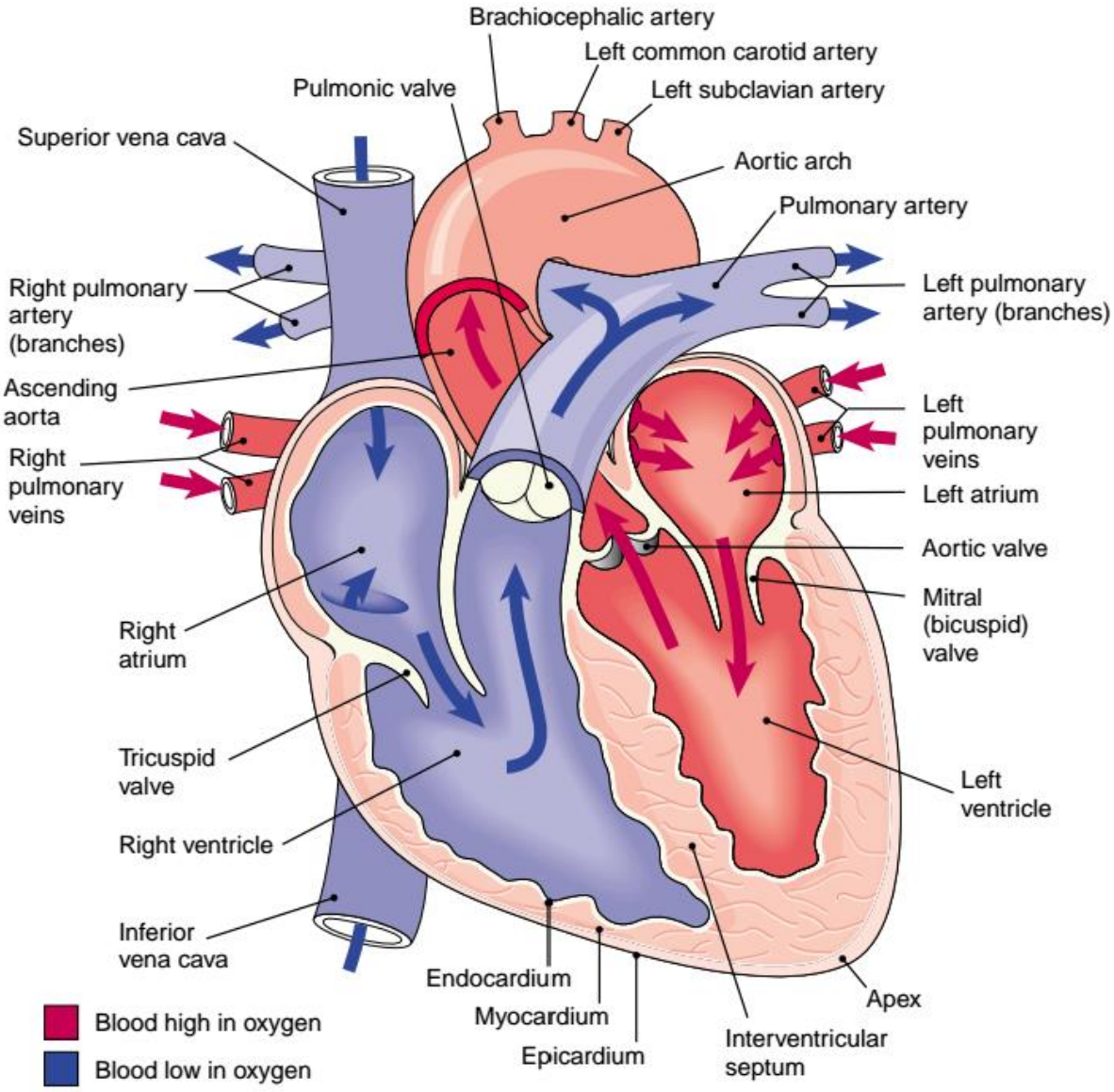

Figure 02: diagram of blood flow through the heart.

(http://www.frankshospitalworkshop.com visited on 29/06/2019)

The pathway of blood through the heart is shown by the arrows in figure two. The right atrium (auricle) receives blood low in oxygen from the body tissues through the superior vena cava and the inferior vena cava. The blood then enters the right ventricle and pumped to the lungs through the pulmonary artery. Blood returns from the lungs high in oxygen and enters the left atrium through the pulmonary veins. From here, it enters the left ventricle and is forcefully pumped into the aorta to be distributed to all tissues.

The heart's pumping cycle consists of two phases, systole and diastole. Systole is when the heart contracts pushing blood out of the chambers. The period between contractions, when the muscle of the heart relaxes and the chambers fill with blood is called diastole.

(https://www.chss.org.uk visited on 05/07/2019)

« Le cycle cardiaque est constitué d'une phase de systole lorsque les chambres du cœur sont pleines de sang, se contractent et éjectent le sang dans les vaisseaux. La systole est suivie d'une diastole, la période au cours de laquelle le cœur se relâche après s'être contracté».

(https://hal.univ-lorraine.fr visited on 09/07/2019)

"The cardiac cycle is consisted of a systole phase, when the heart's chambers are full of blood. They contract and eject the blood in the vessels. The systole phase is followed by a diastole one, during the heart's relaxation after being contracted." (Our translation)

Cardiac anatomy and physiology is extensive, fascinating and interesting. Treating disease requires restoration of normality, so decision must be based upon an understanding of anatomic normality.

4-3- Cardiopathy

The term 'disease' denotes the fundamental concept of medicine and heart disease. It is a group of conditions affecting the heart. It's considered the one of the most common causes of causing mortality in both developing and developed counties. There are some heart problems are common comparing to the others.

4-4- Valvular heart disease

The heart can function normally in case the valves are working properly. However, there are some cases where the valves are affected. "Damage to any of the four valves that control blood flow in the heart." (Davidson, 2010 : 04)

- Any of the four valves can leak, that means the blood backflows through unintentional hole (sometimes called valve incompetence) in the leaky valve.
- The valves can also narrow. This is called valve stenosis this can limit the blood flow through the narrowed valve.

4-5- Angina

A pain in the chest caused by a drop in blood flow then the heart becomes restricted and the heart muscle doesn't get enough oxygen to meet the needs. It happens when

the heart works harder than normal. Over time, several angina attacks may weaken the heart muscle. (https://www.chss.org.uk visited on 09/07/2019)

5- Medical terminology

You can hear medical terms spoken in your doctor's office and read medical articles. In addition, you discuss your own healthcare and the healthcare of your family. Terms such as electrocardiogram, arthritis and anemia describe conditions and tests that are familiar. However, there are medical words which are complicated. Once you divide the terms and learn the meaning of the individual parts, medical terminology will be easier to learn and to understand. (https://appgrooves.com visited on 23/02/2019)

"المصطلح في العلوم الصحية هو اللفظ أو العبارة أو الرمز الذي يبين مفهوما مجردا أو محسوسا داخل مجال العلوم الصحية." (الخياط 2007 : 62)

"Terminology in medical science is a term, an expression, or a symbol used to present abstract or concrete concepts that are specific to medical science". (Our translation)

5- 1- Elements of medical terminology

There are four types of word parts used to create medical terms, **prefixes, word root, combining forms and suffixes.**

5-1-1- Prefixes

Prefixes come at the beginning and usually identifies some subdivision or part of the central meaning.

Example:

Endocarditis ⟹ inner layer of heart inflamed

Myocarditis ⟹ muscle layer of heart inflamed

5-1- 2- Word root

It contains the basic meaning of the term. In medical terminology, this word part usually, but not always, indicates the involved body part. For example, the word root meaning heart is cardiac.

"**الجذر** الجزء الاساسى لكلمة ما (basic part of a word). فهو الجزء ذوا لمعني الأساسي لكلمة ما الذي ينتج بعد إزالة جميع الزوائد(affixes) والذي لا يمكن تحليليه إلي حد ابعد إلي عناصر أخري ذات معني . "

(خباز، ريس، 2011: 4)

"**Root** is the basic part of a word. It contains the basic meaning of any word after eliminating all the affixes and cannot be reduced into other meaningful constituents."

(Our translation)

5-1-3- Combining form

A combining vowel sound plus the combining word root is called a combining form. The letter **'O'** is the most commonly used. The combining form meaning stomach is gastro/o. When a combining form appears alone, it is shown with a back slash (/) between the word root and the combining vowel. The combining vowel added to make the medical term easier to pronounce.

If a suffix does not begin with a vowel, we can use a combining vowel to connect between the word root and the suffix.

Example:

Neurology (study of the nervous system)

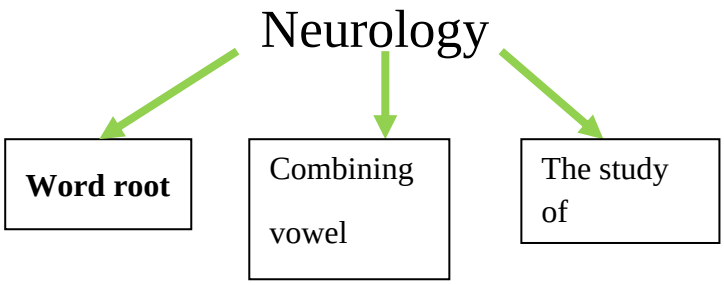

Figure03: elements of a combining form

However, if a suffix begins with a vowel, there is no need to use a combining vowel to connect the word root and the suffix as in the word **gastroenteritis (**an inflammation of the stomach and the small intestine)

1-1-4- Suffix: a morpheme added at the end of a word in order to obtain a new meaning. "Usually, but not always, indicates the procedure, condition, disorder, or disease. A suffix always comes at the end of the word."

(http://www.frankshospitalworkshop.com visited on 02/04/2019)

For instance:

The word **pericarditis** refers to the inflammation of the pericardium (The inflammation of the fibrous sac around the heart).

Pericard ⟹ **pericarduim**

_itis ⟹ **inflammation**

(http://www.frankshospitalworkshop.com visited on 02/04/2019)

6- Word analysis

All the medical terms contains suffixes. It differs from a word to another. For instance, in the word **Hematology, hemat** which is the root means blood and the suffix **logy** means the study of. The third part of the word is the letter **o** which is called a combining vowel, has no meaning alone but it is an important connector between the root and the suffix. The meaning of the root and the suffix, hematology, is the study of blood.

Electrocardiogram (ECG or sometimes EKG) is a familiar medical term means record of the electricity in the heart.

The following figure shows its parts.

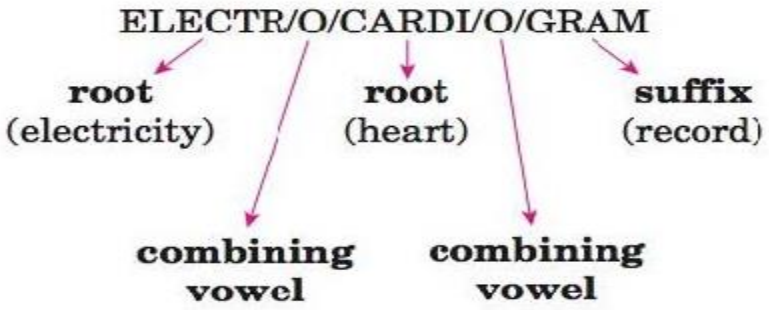

Figure 04: elements of medical words.

(http://samples.jbpub.com & http://www.comcourse.com visited on 13/08/2019)

"لتمكن من تحليل الكلمات لا بد من معرفة العناصر التي تتكون منها وهي :

الجذر(roots) والزوائد (affixes) التي تشمل السوابق (prefixes) واللواحق (suffixes) والدواخل (infixes)

(خباز، ريس ،2011: 3)

"In order to analyse words, you should know their elements which are:

Roots, affixes, suffixes and infixes". (Our translation)

6-1-Derivation

« La dérivation est un procédé linguistique qui consiste à former des mots nouveaux par ajout d'affixes à un mot appelé base ou racine. »

(http://tel.archives-overtes.fr visited on 02/06/2019)

"The derivation is a linguistics procedure that consists to form new words by adding affixes to a word called basic or root." (Our translation)

Medical etymology is the origin of medical words and terms. It's all about the history of medicine and human ideas. Greeks are the founders of the rational medicine in the golden age in the fifth century B.C. It's estimated that three-forth of medical words come from **Greek** or **Latin,** along with most of the prefixes and suffixes that form the beginning or the end of many medical terms. Numerous other languages, including Arabic, French, German and others, have also contributed to the great treasury of medical terms. For example the word '**diabetes'** is borrowed from a Greek word meaning 'a siphon'.

A Greek physician, Aretus CAPADOCiIAN, named the disease '**diabetes'**. He explained patients with it had polyuria and passed water like a siphon.

(https://www.google.com & https://www.medicinenet.com visited on 03/06/2019)

"Although medical terms have been drawn from many languages. A large majority are from Greek and Latin. Terms of Greek origin occur mainly in clinical terminology (e.g. cardiology, nephropathis, gastritis), Latin terms make up the majority of anatomical terminology (Nomina Anatomica) (e.g. cor, ren, ventriculus)"

(http://www.ilekt.med.unideb.hu visitd on 03/06/2019)

6-2-Pronunciation and spellings

Greek and Latin vocabulary play a large role in medical terminology, especially when it is about the parts of the body. Learning medical terms is challenging. Their different origins led

to unusual changing of the singular word into plural form.

Examples:

Singular ⟶ **plural**

Cort**ex** ⟶ cort**ices (**outer part of organ)

Atri**um** ⟶ atri**a** (one of two upper chambers of the heart)

Gangli**on** ⟶ gangli**a (**group of nerves cells)

Calcul**us** ⟶ calcul**i** (stones)

Esopha**gus** ⟶ esophag**i (**the tube that carries food from the pharynx to the stomach)

(http://www.comcourse.com visited on 03/06/2019)

Moreover, pronunciation may vary from country to country, even in the same region of the same country. In the USA the term gynecology is usually pronounced with hard '**g'** **/gaɪnɪkɒlədʒɪ/** but in some other areas soft '**g'** is used**/dʒaɪnɪkɒlədʒɪ/**.

Some of the terms are long. They often reduce an entire phrase to one single word, generally difficult to spell and to pronounce. In medicine, one single mistake is able to make a big difference. One letter spelling error can change the entire meaning; You could give a wrong medication or just give the right medication the wrong way.

Examples: the terms presented with their pronunciations. The capitalized letters in boldface indicate the accented syllable.

1- **Arteriosclerosis (** ar- tee- ree- oh- skle- **ROH- sis**) is the abnormal hardening of the walls of an artery or arteries.
2- **Otorhinolaryngology (**oh- toh-rye- noh- larg- in- **GOL**- oh- jee**)** is the study of ears, nose and throat.

Sphygmomanometer (fig- mo-man-**OM-** e- ter) is an instrument for determining blood pressure. (http://www.frankshospitalworkshop.com visited on 12/06/2019)

6-3- Abbreviations

Abbreviations are commonly used in medicine to record long and complex medical terms, shorten documents and notes and also to save time in case they are universally understood. Abbreviations can cause confusion and errors. The same abbreviation may have different meanings in different fields. Moreover, an acronym is an abbreviation formed from the first letters of the words in a phrase.

The following table shows common ones.

Abbreviation	Meaning
ENT	Ear, nose and throat
ECC	Emergency cardiovascular care
HDL	High-density lipoprotein
LDL	Low-density lipoprotein
TOE or TEE	Trans-esophageal echocardiogram

Table 01: most common abbreviations

6-4- Symbols

Symbols are commonly used in different institutions as a form of shorthand. Like abbreviations, symbols can lead to confusion, so using and interpreting them should be done carefully.

Some common symbols:

® ⟹ right (L) ⟹ left ~ ⟹ approximately

Δ ⟹ change (Greek delta) Ø ⟹ no, not, non

♀ ⟹ female ♂ ⟹ male ≠ ⟹ not equal

(http://samples.jbpub.com & http://www.frankshospitalworkshop.com visited on 10/06/2019)

Conclusion

Medical professionals for whom English is a native language are often perfectly capable of understanding medical articles about cardiology. However, lay readers and semi-experts for whom English is a foreign language might be difficult to understand medical terminology. Therefore, medical translators play an important role in knowledge mediation such as sharing medical research results.

Chapter two

Medical translation

Translation is a mental activity in which the content of an original text known as the source text is replaced with another one known as the target text. The translator needs to have a good knowledge of both, the language to be translated (ST) and the language to be translated into or arrived at (TL). According to Ghazala (1995), "translation is generally used to refer to all the process and the methods used to convey the meaning of the source language to the target language." Therefore, Translation is an intellectual exercise, through its ideas and pieces of information are disseminated from one culture to the audience of another culture. In this way, it enables the exchange of ideas among a diversity of people from different cultures. Therefore, it is common to find cultural elements in any kind of text, even in specialized texts, such as medical texts.

1- Medical translation

Medicine is one of the most important fields that exists in the world today. Researchers struggle to find ways to cure life-threatening diseases and invent drugs and devices to make our lives easier when we are sick. However not all the research findings and articles are necessarily reported in one language. Everyone should have access to the information, whether it is other medical researchers, doctors or other members of the public who are interested in this area. These are the benefits of the medical translation and this can be done by medical translators who are proficient in providing accurate translation.

Medical translation covers a number of areas in medical field. It involves many aspects of human health, including the translation of information pertaining to pharmaceutical products such as drug prescription information, medical device manuals, clinical trial literature, patient education and medical history. As well as the translation of important products, research findings and patient medical notes and reports.

1-2- The importance of medical translation

The world of medical research is developing rapidly in order to meet the demand for efficient and effective medicine development. Every day new kinds of drugs and medical devices are introduced and hundreds of research findings are revealed around the world.

Therefore, Translation plays a vital role in the progress of process. It is critical to ensure that products meet international standards and adhere to the strict guidelines in the medical field so that they can be successfully launched on the market. The proper translation is crucial in this case since a mistranslated term can break the entire undertaking or increase enormously the turnover time.

Medical translation plays a key role in helping healthcare providers the necessary treatment needed for patients who do not speak their language well enough to allow proper communication. Doctors whose patients who do not speak their language need to be able to provide instructions to these patients in a language they can understand. They also may need medical translators to translate the medical histories of any patients who have recently moved to the country and do not speak the host country's language.

Patients also should have a full understanding of their health condition and how their doctor is going to treat it. Additionally, pharmacists who provide drugs for patients prescribed by a doctor need to get medical translators to translate dosages and other drug information so that the patient does not misunderstand the instructions and so as to use the drugs correctly. Therefore, a speedy and accurate document translation is of a great importance.

Usually, information about drugs and medical devices are provided in the national language of the country who is selling the products but it is far more complex today where people movement is at its highest. Life-saving information in medical field needs to be accessible in all the languages of those who are likely want to access such information. Even though each country speaks a different language, people fight the same diseases and struggle with the same health issues. If translation in other fields mainly serves the purpose of sales and business expansion, medical translation serves another noble cause which is humanity.

1-3- How to translate a medical text?

In medical translation, even one tiny mistake will lead to serious problems and can be dangerous to human health. Just a mistranslated word in medication dosage or allergies can result in irreversible damage to users.

A medical translator must have extensive knowledge of medicine, pharmacology and also technology to handle the medical documents effectively. Biochemistry, genetic engineering and physics comprehension are also required in some typical fields. Therefore, to produce a perfectly accurate medical translation, you must be a professional linguist and a medical expert at the same time.

2- Vinay and Darbelnet Techniques of translation

J. P. Vinay and J. Darbelnet (1958) reject individual words as units of translation by emphasizing that translators deal with ideas and feelings in various semantic fields, rather than individual lexemes.

There are two basic translation methods and seven strategies presented by Vinay & Darbelnet. One is 'direct translation' which refers to the literal transfer of the words, includes *borrowing, calque and literal translation*. The other is 'oblique translation' which refers to the free transfer of the words, embraces *transposition, modulation, equivalent or reformulation and adaptation.*

2-1- Direct/ literal translation procedures

Direct translation procedures are used when structural and conceptual elements of the source language can be transposed into the target language. Direct translation procedures include:

2-1-1- Borrowing

Borrowing is relatively the simplest of all procedures used for translation. It refers to the case where a word or an expression is taken from the source language and used in the target language either because the target language does not have a lexicalized correspondence, for stylistic or rhetorical reasons. "It would not even merit discussion in this context if translators did not occasionally need to use it in order to create a stylistic effect. For instance, in order to introduce the flavour of the SL culture into a translation, foreign terms may be used" (Vinay and Darbelnet, 1958: 31 & 32)

Nowadays, it is frequently caused by new technologies entering rapidly the surrounding reality. For example, the word *tablette* appears to function in Algeria exclusively in a lexical form borrowed directly from French. In English there are words no longer considered as borrowings , e.g. *rendez-vous, chic, menu,* etc.

(https://www.researchgate.net visited on 12/06/2019)

2-1-2- Calque

A special borrowing in which the TL borrows an expression from the source language by translating all the original elements literally. The result creates either, *a lexical calque or a structural calque*.

a- *A lexical calque* keeps the syntactic structure of the target language, but at the same time introduces a new mode of expression. For example, the English term *skyscraper* is *gratte-ciel* in French.

b- *A structural calque* introduces a new construction into the language, i.e. *science fiction* in English is *science fiction* in French.

Since borrowing and calque are strongly related, it is hard to distinguish between them.

Borrowing in translation is not always justified by lexical gaps in the TL. It can also be used as a way to preserve the semiotic and cultural aspects of the original word in translation.

2-1-3- Literal translation

It is also called word for word translation or metaphrase, relies on the direct transfer of a text from source language into a grammatical and meaningful text in target language.

According to Vinay and Darbelnet, a literal translation can only be applied with languages which are close in cultural terms. French and Italian are two languages of the same family, and works most efficiently when they also share the same culture. It is acceptable only if the translated text retains the same syntax, the same meaning and the same style as the original text, i.e. *the end justifies the means / la fin justifie le moyen*

However, having one sentence can be translated literally across languages does not mean that all sentences can be translated literally. On the one hand, this procedure is among preferred ways of translating in functional contexts such as the legal text. On the other hand, scholars and authorities refuse to consider it as a proper translation, since it relies on transcription rather than searching for the cultural and semantic equivalent word in the target text. When the target text has no meaning or gives another meaning even after applying the first three procedures, the resulting still unacceptable. In this case, the procedures of oblique translation can be used to obtain a better result.

2-2- 1- Oblique/ free translation procedures

Oblique translation procedures are used when the structural or conceptual elements of the SL cannot be directly translated. Thus, altering meaning or upsetting the grammatical and stylistics of the TL is needed. Oblique translation procedures include :

2-2-2-Transposition

Transposition involves moving from one grammatical category to another without changing the meaning of the text. It is to replace a word class of the source text into another

different word class in the target language such as replacing singular by plural or a noun by a verb. Grammatical structures are often different in different languages. Transposition is a highly versatile translation procedure, i.e. *the doctor thinks that* can be transposed to, *selon le medecin.*

It can also be applied intalinguistically. For instance, *he announced he would resign.* can be transposed to, *he announced his resignation.* "The method called transposition involves replacing one word class with another without changing the meaning of the message. Besides being a special translation procedure, transposition can also be applied within a language." (Vinay and Darbelnet, 1958:36)

There are two types of transposition: obligatory transposition and optional transposition.

***a*- Obligatory transposition,** i.e. *as soon as he gets / got up….. Dès son lever…or dès qu'il se lève …*

***b*- Optional transposion,** i.e. *he acknowledged that he was wrong / he acknowledged his mistake.*

2-2-3- Modulation

Modulation consists of using a phrase that is different in the source and target languages to convey the same idea. Through modulation, the translator generates a change in the point of view of the message without altering the meaning, i.e. *Maybe you are right* can be translated to, *tu n'as peut-être pas tort.*

According to Vinay and Darbelnet, there are two types of modulation. Fixed or obligatory modulation and free or optional modulation. For the first type, fixed modulation is usually used in bilingual dictionaries. It is conventionally established, i.e. *dormer sur deux Oreilles / to sleep soundly.* The second type, which is free modulation is considered to be more practical in cases where literal translation is unsuitable."Cases of free modulation are single instances not yet fixed and sanctioned by usage, so that the procedure must be carried out a new each time…when carried out as it should be, the resulting translation should correspond perfectly to the situation indicated by the SL." (Vinay and Darbelnet, 1958: 37)

Vinay and Darbelnet distinguish between eleven categories or types of free modulation. For instance, Negated contrary, e.g. *it is difficult* may be translated by *ce n'est pas facile. He never lies* can be translated by *il est honnête.*

It should be noted here that these examples are all free translations and their correctness depends on the context.

There is a difference of a degree between free and fixed modulation. As soon as a free modulation is often used enough, or is felt to offer the only solution, it may become fixed. However, a free modulation does not actually become fixed until it is referred to in dictionaries and grammars.

2-2-4- Equivalence or reformulation

The translator produces an equivalent text in the target language by using completely different stylistic and structural methods to transmit the same reality. Through this procedure, named of institutions, interjections, idioms or proverbs can be translated.

Classical examples of equivalence include translation of exclamations and expletives. For instance, English *Ouch!* corresponds to French, Aïe! In general, proverbs are perfect examples of equivalences.

Examples:

Like a bull in a china shop – Comme un chien dans un jeu de quilles

She is innocent as an egg – elle est innocente comme un agneau.

The method of creating equivalences is also frequently applied to idioms For example, *like two peas in a pod* and *be in somebody's shoes* can't be translated by means of a calque.

(Wray, 2001: 183 & 213)

2-2-5- Adaptation

This procedure reaches the extreme limit of translation. Adaptation occurs when a specific situation to one language culture is expressed in a totally different way that is familiar or appropriate to another language culture. It involves changing the cultural reference when a situation in the source culture does not exist in the target culture. In this case, Translators create a situation that can be considered as equivalent. An example of cultural substitution is clearly seen in the following translations :

a- *Baseball / football*

b- *England has Irish jokes and France has Belgian jokes.*

Adaptations are particularly frequent in the translation of book and film titles.

(https://www.researchgate.net visited on 12/06/2019)

3- The translation of medical abbreviations, acronyms and eponymous

The main problems of translation are associated with the translation of medical abbreviations, acronyms and eponymous.

3-1- Definition of medical abbreviations

Abbreviation is coined from Latin "brevis" which means short; they were needed for making quick transcriptions of spoken language. Abbreviations and acronyms are one of the most problematic lexical groups. " A shortened or contracted form of a word or phrase, used to represent the whole, utilizing omission of letters, or duplication of initial letters to signify plurality, including signs such as +, =, @." (http://wiktionary.org visited on 20/10/2019)

Examples

- Sx (symptom) ⇒ الأعراض
- Ac (before meals) ⇒ قبل الوجبات
- ER (emergency) ⇒ الطوارئ
- H/A (headache) ⇒ الصداع
- AMT (amount) ⇒ كمية

Abbreviations are spelled variously (in most cases in small letters) according to the rules of a particular language. There are different types of abbreviations. The majority of linguists do agree that abbreviation can appear in the form of acronyms, blends, clippings and initialisms which are labeled differently:

3-2- Definition of medical acronyms

Acronyms are shortenings that unlike abbreviations are read and seen as ordinary lexical units. They are words formed from the initial letters of a group of words, and pronounced as full words.

English acronyms enter other languages. They are both used by medical professionals and patients, especially if no native acronym is commonly used in the local language. They are widely used to refer to diverse medical phenomena like names of diseases and health-related organizations. "An acronym (L. ácros- external), by contrast, as a word created from a string of one to several capitalized initial letters or syllables."

(http://translationjournal.net visited on 21/10/2019)

There are two major groups of acronyms: general and author-specific.

a- **General acronyms:** are readily found in the specialist literature.

b- **Author-specific:** are often complicated to understand unless explained by the author.

Examples

- WHO (World Health Organization) ⇒ منظمة الصحة العالمية
- AMA (American Medical Association) ⇒ الجمعية الصحية الأمريكية
- CAD (Coronary Artery Disease) ⇒ أمراض الشرايين التاجية
- MI (Myocardial Infarction) ⇒ النوبات القلبية
- NYHA(New York Health Association) ⇒ جمعية نيويورك للقلب

3-3- Definition of medical Eponyms

Eponyms are in daily use in medicine. They are created in order to commemorate the importance of the contribution. They also bring colour to medicine and embed medical traditions and culture in history. In addition to this, they are often practical and a form of medical shorthand. Most of the times indicate the name of a person, often a physician or scientist, who was the first to identify a medical condition or technique. Eponyms constitute a considerable portion of medical terminology.

"MEDICINE **medical name from person:** a medical name, e.g. that of a disease, derived from the name of a person." (www.les-encyclopedies.com visited on 21/10/2019)

The following table shows the common ones :

Medical names	***Examples***
1. Anatomical parts	*Purkinje fibre, bundle of His, Adam's apple*
2. Diseases	*Parkinson's disease, Alzheimer's disease*
3. Signs and symptoms	*Babinski sign*
4. Fractures	*Jefferson fracture*
5. Procedure	*Heller myotomy*
6. Medical devices	*Bard- Parker scalpel*
7. Names of celebrity patients	*Lou Gehrig disease*
8. Fictitious characters	*Othello's syndrome*
9. Geographical places	*Lyme diseases*

Figure 04: example of English eponymous terms

Examples of English eponymous terms and their eponymous equivalents in Arabic :

- Carleton's Spot ⇒ بقع كارلتون(في عضام المصاب بالسيلان)

- Carlsbad Salt ⟹ ملح كارلسباد(مسهل)
- Carman's Sign ⟹ علامة كارمان(علامة شعاعية لسرطان المعدة)
- Widmark's Test ⟹ اختبار ويدمارك(في التسمم الكحولي)

Eponyms may be the source of translation problems. The correspondence between eponymous terms and their equivalents do not necessarily mean that both source and target terms in some languages.

Possessive form of eponyms is extant, but not extinct. Gradual decline of possessive form is evident in print and electronic publications. As non possessive form is more efficient, simple and non-confusing, and has both linguistic support and the major international organizations. (http://www.diva-portal.org visited on 22/06/2019)

3-4- Punctuation and spelling

The style of writing abbreviations requires special attention so that a translator does not end up with a paragraph cluttered with unexplained capital-letter combinations. It is also a

useful procedure to precede an acronym with its head word which can either be an element included in the acronym itself, e.g. *hormone ATCH.*

Latin prescription abbreviations are traditionally spelled in small italicized letters, with dots in-between. In most cases they are concerned with the administration of medicines, e.g. *s.i.d. ─ once a day, s.l.─ under the tongue.*

Usually, abbreviations (especially of organizations) are written without dots in between. However, an apostrophe can be used before the S in plurals of an abbreviation as in *MP's, CD's.* in addition, few abbreviations are punctuated with slashes for example : *c/o, care of* and *w/o, without.*

As mentioned earlier, most abbreviations are spelled in small letters, as in *radar* and *laser.* Besides, Translators must also remember that the definite article is never to be placed either before acronyms or abbreviations articles are frequently dropped, as in UNESCO not the UNESCO. The new technique of using small caps is sometimes used in order to make the run of capital letters seem less boring to the reader. For example, the style of some American publications, including the Atlantic Monthly and USA Today, is to use small caps for

acronyms longer than three letters; thus U.S. and FDR are in normal caps, but NATO in small caps. The acronyms AD and BC are often written as small capped as well.

Concerning numbers (both cardinal and ordinal) in names, they are often represented by digits rather than initial letters: as in *4GL* (Fourth generation language) or *G2* (Group of 2). Large numbers may use metric prefixes, as with Y2K (for Year 2000) (sometimes written Y2K, because the SI symbol for 1000 is k - not K, which stands for Kelvin). Exceptions using initials for numbers include TLA (three-letter acronym/abbreviation) and GoF (Gang of Four). Acronyms that use numbers for other purposes include repetitions, such as W3C (World Wide Web Consortium); pronunciation, such as B2B (business to business).

The decision whether to keep to the original abbreviations or alter it to adapt to the target culture will once again depend upon the translator's competence, experience, specialized knowledge and also the TL. For instance, in Arabic language the use of abbreviation in all its forms may be dated to the influence of translating these forms from the different forms of European languages. The Arabs did not tend to use abbreviation and did not hence have any rules concerning this tool because they are mainly related to writing and this latter was not given real importance since Arabic is read more than it is written.

(URL:http://translationjournal.net visited on 11/09/2019)

4. Some problems in translating medical terms

Translation is a difficult task especially in the field of medicine. The translator have to overcome all the problems.

4-1- Abbreviation as the most common medical translation problem

Medical abbreviations appear extremely fast in modern English, evidenced by abbreviations that are not registered in dictionaries. Often accompanied by no explanations and leave translators with no sources of reference at all. Moreover, the main problem of medical abbreviations translation is that the same abbreviations may have different meanings, depending on the disease and anatomy etc. For instance :

1- *AS (arteriosclerosis*) /مختصر تصلب الشرايين
2- *AS (aortic stenosis)* /مختصر تصلب الشرايين التاجية

Once the precise meaning of an acronym is established, the translator is faced with a dilemma of choosing the correct equivalent for it.

The problem of translating prescriptions makes matters worse. The prescription was illegibly handwritten, making the words, even the abbreviation (especially the last one) the more obscure.

4-2- False friends in medical translation

A non-professional individual may think that a similar sounding word in a TL is the correct translation of the particular medical term in the SL, e.g. the literal translation of the stomach condition *peptic ulcer* in French is *ulcère peptique*. This is incorrect. The correct translation in French is actually *ulcère gastro-duodénal.*

Specialists in medical translation should know that there is no room for errors in medicine. Bad translations can cause bad complications.

5-Medical translation demands accuracy

Whether it is pharmacological instructions or doctor's notes, accurate medical translation is extremely important. People's lives may depend on the exact meaning of a word, as it describes medical procedures, the composition of a medication, or instructions for treatment. That is why medical translation demands accuracy. Errors are not tolerated since it is the people's lives that are in danger. Furthermore, important documents, such as clinical reports, instructions for use, medical research, or medication labels are essential for people's health. Any error here can cause serious damage, not only for the producer, but also for patients.

Medical translation needs technical precision. Translators can not exclude, add or substitute anything. For example, leaving out key data in dosage instructions can transform a perfectly good medication into life-threatening pills. A word missed out in a patient's file can change a diagnostic. Specialized translators often take years to learn how to handle specific situations and problems in medical translation. Their accuracy makes the difference when any mistake can cost lives.

Conclusion

To conclude with, translators may face many difficulties during the translation of medical terms from Arabic into English and vice versa. Thus, there have been great efforts to bring new medical terms into Arabic by following different methods and strategies. However,

translators should take into consideration the linguistics differences between English and Arabic and select the most suitable ones to make a proper translation.

Chapter three

Commented translation of some

Cardiological terms

Part three: Commented translation of some cardiological terms

Through what has been discussed in the previous chapters it became clear that translating medical terms on cardiology is not an easy task. Medicine is an important sector because it involves human lives. Medical texts are filled with medical jargon and abbreviations. Therefore, it is necessary to follow methods and strategies to ensure precision in translation.

The present chapter represents the commented translation of some cardiological terms of the study. The data is gathered from a book entitled: ' أمراض القلب وشرايينه التاجية ' , published in Cairo. It consists of Arabic medical terms and their equivalent in English. In this research, we adopted a method which is comparative stylistics.

The research aims to compare between, Arabic as a source language and English as a target language in order to analyze the translation procedures employed in translating medical terms.

1- Presentation of the corpus

The corpus we chose for our study is a book on cardiology entitled "أمراض القلب و شرايينه التاجية" . It was edited in 1999 by Ayman Abu El Magd in Cairo, Egypt. The author used a scientific simplified style in order to meet the patient's needs to understand heart diseases. It is a scientific study of diseases causing by angina and heart attacks named coronary heart diseases, or CHD for short.

In addition, he explained the symptoms, the complications and the factors responsible for heart diseases and how to deal with them, also how to treat them for a long term. Furthermore, the doctor in this book discussed the symptoms of coronary insufficiency and the relationship of psychological factors with coronary artery diseases. Moreover, the psychological effects of a stroke in the coronary artery and how to deal with it.

The author has presented surgical and non surgical means for treating CAD such as, Stent, Laser, rotablator and angioplasty (involves stretching narrowed areas of blood vessels). Furthermore, he dealt with them by using an objective scientific evaluation to each one and far from the influence of the mass media.

Doctor Abu El Magd has given a special interest to a particular number of patients such as: women, youths and athletes.

To conclude with, the author has given advices to prevent heart diseases. Therefore, he suggested ten tips for healthy nutrition by improving a diet. Anyone can eat more healthy food

by following simple guide lines. The book can be considered as an attempt to fill gaps in the Arabic Medical Library.

1-1- The author's biography

Doctor Ayman Abou-El-Magd, this is his full name. His first name is Ayman and his family name is Ebu-El-Magd. He is an Egyptian cardiologist born on September 15th, 1961 in Cairo, Egypt. He is a professor of cardiology in the faculty of medicine at Al-Azhar University. He is a university lecturer at Giza in Egypt and a Laser Technology consultant at The National Institute of Laser Enhanced Science (NILES), Cairo.

He got a diploma in Laser Systems in (NILES) in 2002 and MSc. in Laser Systems Department in 2006. He wrote a thesis entitled "Utilization of Pulsed Laser Deposition (PLD) in Quantum Dot Optical Detectors.

Dr. Abu El Magd has an excellent command of Arabic and English, he is also good in German and some knowledge in French thus he has many experiences in different countries. For instance, he worked from (1987-1990) as a Physics Specialist Laboratory of Laser physics in the faculty of sciences and also teaching experimental physics for five years in the faculty of science, physics department in KSU, Riyadh from 1994 till 1998. Furthermore, he worked also as a teacher of heart diseases.

He worked as Laser specialist in Institute Fur Laser Und PmasmaphysikHeinrich Heine Univarsat, Duesseldorf in Germany in (1992-1994). He worked also as Laser specialist in ODU (Old Domain University) in Norfolk, Virginia, USA.

Doctor Abu El Magd participated in several international conferences such as the 32nd international conference about "*Performance of plasma produced by pulsed laser deposition (PLD) system for thin film nanoparticles and GeS quantum dot*" on July the 31st, 2015, in Iasi, Romania.

Doctor Ayman Ebu El Magd is one of the doctors who encourages the stretching of the affected arteries by inserting a balloon along a guide wire; then inflating it at the site of the blockage to improve blood flow without surgery (angioplasty). He has different researches in the sector of stretching arteries in complicated cases published in patrols and presented in Egypt and in international conferences. (https://scholar.cu.edu.eg visited on 02/10/2018)

2- Selected examples and analyses

Part three: Commented translation of some cardiological terms

In our study, we have chosen some cardiological terms which are going to be a sample of our analyses under the light of comparative stylistics strategies. The study contains also our attempt to translate some passages from the corpus ' أمراض القلب وشرايينه التاجية ' written by Aymen Abu El Magd. The translated passages are followed by analyses of the cardiological terms put in bold.

In our analyses, we stared by giving the original text which includes the (CTs).

Then we have presented our translation. In the next process, we defined some (CTs) according to dictionaries and other resources. After that, we have chosen their equivalent and justified our choice.

2-1- Literal translation

Example one

The original text:

"نستطيع أن نتخيل القلب علي انه شبيه بالمنزل الذي يتكون من أربع غرف ،غرفتين كبيرتين و هما : ا لبطين الأيسر (الغرفة الكبرى الرئيسية) وهي التي تقوم بمهمة ضخ الدم إلي الشريان الأورطي الذ ي يقوم بتوصيل الدم الذي يحمل الغذاء والأوكسجين إلي جميع أجزاء الجسم ..."

Our translation

" We can imagine that heart is like a house. It has four rooms. The left **ventricle** (the principle big room) ejects blood into the **aortic** artery. The latter, transfers blood high in **oxygen** and nutrients to all the rest of the body..."

Analysis

In this example, there are three medical terms: *ventricle, aortic artery* and *oxygen*.

a- ventricle = البطين

- **The definition of the word 'البطين' in Arabic**

According the Arabic dictionary "معجم الأمراض وعلاجها" Witten by Zineb Mansour Habib in 2010, the Arabic definition of the word 'البطين' is :

"البطين :[مفرد] : [التشريح] احد الجوفين السفليين للقلب اللذين يجمع فيهما الدم ثم يدفع في الشرايين، وهما بطينان أيمن وأيسر(جدار بطيني). "

(http// onlotology.birzeit.edu/tem/ البطين visited on 20/11/2019)

- **The definition of the word ' ventricle' in English**

"The term *'ventricle'* is a heart chamber, either of the two lower chambers of the heart that receive blood from the upper chambers atria and pump it into the arteries by contraction of their thick muscular walls.

(http://medical-dictionary.thefreedictionary.com visited on 20/11/2019)

In our translation, we have translated the word *البطين* with a word in English *ventricle.*

This means that: " Ventricle: [singular] :[anatomy] one of the lower chambers of the heart where the blood saved and then pumped into the arteries, which are the right and the left ventricles , (ventricular wall)." (Our translation)

The procedure used in this example is literal translation. The word ' البطين 'in Arabic has the same meaning with the word '*ventricle*' in English.

b- Aorta = الشريان الأورطي

- **The definition of the word ' الشريان الاورطي'in Arabic**

According the Arabic dictionary "معجم الأمراض وعلاجها", the meaning of the word 'الشريان الاورطي' is :

"Aorta الأورطي /الوتين : الشريان الرئيسي الذي يغذي الجسم بالدم النقي الخارج من القلب."

(http://onlotology.birzeit.edu/tem/ visited on 22/11/2019 الوتين)

- **The definition of the word 'aorta' in English**

"The aorta is about 3 cm in diameter at its origin in the upper surface of the left ventricle. Carries blood form the latter for all the branch arteries in the body except those in the lungs."

(http://medical-dictionary.thefreedictionary.com visited on 22/11/2019)

The translation of the word الشريان *الأورطي* in Arabic with the same word *aorta* in the target text as it is in the source text because the word is borrowed from the receptor's language.

This means that: "Aorta: The main aortic artery that supplies the body with pure blood which goes out of the heart." (Our translation)

The procedure used in this example is literal translation**.** Both words have the same meaning and the same literal spelling, the English term '*aorta'* in Arabic letters 'الأورطي' Furthermore, The Arabic word is pronounced almost the same as the English one. However, the word aorta has equivalents in the Arabic dictionary. It has different names like, الابهر/ الوتين الشريان

c- Oxygen = الأوكسجين

- **The definition of the word 'الاكسجين' in Arabic**

The word 'الأكسجين' is defined in the dictionary of " معجم الأمراض وعلاجها " as follow :

" الأكسجين (كيما) : غاز غير مرئي ضروري لجميع الكائنات الحية ، وهو لا لون له ولا رائحة ، يوجد في الهواء بصورة حرة."

(http// onlotology.birzeit.edu /term / الأكسجين visited on 23/11/2019)

- **The definition of the word 'oxygen' in English**

" *Oxygen* is a colourless odourless gas that is the most abundant element and essential for human beings, plant and animal's resperation. Symbol O."

(http://medical-dictionary.thefreedictionary.com visited on 23/11/2019) The word ' *الأوكسجين*' in Arabic is translated with the word '*oxygen'* in English.

This means that : " (Chem) : an invisible gas and essential for all the organisms. It is colourless and odourless. It exists freely in the air." (Our translation)

The procedure used in this example is literal translation**.** Both words have the same meaning and the same literal spelling, the English term '*oxygen'* in Arabic letters ' *الأوكسجين* ' Furthermore, The Arabic word is pronounced the same way as the English one.

Example two

The original text

"ذكرنا من قبل أن القلب عبارة عن مضخة تقوم بدفع الدم الذي يحمل الغذاء والأوكسجين إلي جميع أجزاء الجسم ، وبذلك يستطيع كل عضو أن يقوم بمهامه علي أكمل وجه. وحتى يستطيع القلب أن يقوم بمهمته تلك لا بد أن يحصل هو أيضا علي دم يحمل الغذاء والأوكسجين، وهو ما يتم عن طريق ثلاثة شرايين رئيسية تسمي بالشرايين التاجية... لأنها تدور حول القلب مثلما يدور التاج حول الرأس ."

Our translation

"As we have mentioned before, heart is a pump that injects red blood which is rich in oxygen and nutrient around the body. Therefore, every organ works properly. Heart, itself needs good blood supply provided by three arteries called **coronary arteries**… because of their resemblance to a crown. They pass over the surface of the heart as the crown turns around the head."

- **Coronary arteries = الشرايين التاجية**

- **The definition of the word 'coronary arteries' in English**

"Coronary arteries are the branches of the right and left coronary distributed to the muscles of ventricles."

(http://medical-dictionary.thefreedictionary.com visited on 23/11/2019)

In our translation we have translated the word ' *الشرايين التاجية* ' in Arabic with the word '*coronary arteries'* in the target language.

- **The definition of the word 'الشرايين التاجية' in Arabic**

The meaning of the word 'الشرايين التاجية' in the dictionary "معجم الأمراض وعلاجها" is :

" شريان [المفرد] ج شريانان أو شرايين: (التشريح - الطب – الصحة – الأمراض) شريان علي هيئة التاج يغذي عضلة القلب بالدم ."

(http// onlotology.birzeit.edu /term الشريان visited on 23/11/2019

This means that: " Artery [singular] pl. arteries (Anatomy - Medicine – health – diseases) an artery looks like a crown supplies the heart muscle with blood." (Our translation)

The procedure used in translating the words (*الشرايين التاجية* =coronary arteries **)** is literal translation because it serves the meaning properly.

Example three

The original text

"وأتذكر هنا قصة شاب في العشرينيات من العمر، رياضي ملتزم ولا يدخن ولكنه أصيب بجلطة في الشريان التاجي، بل احتاج بعدها لإجراء عملية جراحية لزرع الشرايين التاجية، و قد أذهل الموقف الجميع بمن فيهم الأطباء المعالجين !!"

Our translation

"I remember the story of a young man in his twenties, a committed sportsman. He does not smoke but a clot formed in the coronary artery and then he needed a **coronary artery bypass graft (CABG).** The situation astonished everyone even the doctors."

- **Coronary artery bypass graft (CABG) = عملية جراحية لزرع الشرايين التاجية**
- **The definition of 'coronary artery bypass graft' in English**

"CABG , often pronounced 'cabbage', is an abbreviation for coronary artery bypass graft(also called coronary artery bypass graft surgery or bypass operation). It is a surgical procedure in which one or more blocked vessel graft to restore normal blood flow to the heart."

(http://medical-dictionary.thefreedictionary.com visited on 23/11/2019) In our translation, we have added the abbreviation CABG to translate the Arabic sentence ' عملية جراحية لزرع الشرايين التاجية' because abbreviations are frequently and widely used to refer to diverse medical phenomena.

The definition of the sentence ' coronary bypass graft (CABG)' in Arabic

The meaning of the expression ' *عملية جراحية لزرع الشرايين التاجية* ' in 'bumrungrad' dictionary is:

"عملية جراحية لزرع الشرايين التاجية : لتجاوز الانسداد، يقوم الجراح بعمل فتحة صغيرة أسفل الانسداد الموجود في الشريان التاجي المصاب. إذا تم استخدام الوريد الصافن (من الساق) أو الشريان الكعبري (من الذراع) ، يتم توصيل نهاية واحدة إلى الشريان التاجي والنهاية الأخرى إلى الشريان الأورطي.

(www.bumrungrad.com visited on 22/11/2019)

That means that: “Coronary bypass graft: To bypass the blockage, the surgeon makes a small opening below the blockage in the affected coronary artery. If the saphenous vein (from the leg) or radial artery (from the arm) is used, one end is connected to the coronary artery and the other end to the aorta.” (Our translation)

We have translated the word 'زرع' in Arabic with the word *‘graft’* in English because the word used in the source text has different meaning from the common one used in agriculture. It’s about transplanting a piece of living tissue e.g. coronary arteries, to a part of a patient’s body. It can be either from a donor or from another part of the patient’s body.

The procedure used in translating the expression *‘Coronary artery bypass graft (CABG) = عملية جراحية لزرع الشرايين التاجية’* is literal translation because the expression used in Arabic has the same meaning according to the context of the source text.

2-2**Equivalence :**

Example one

The original text

"وإذا كانت الحقيقة تكمن في المقولة التي يعرفها الجميع ويطبقها القليل، ألا وهي أن العقل السليم في الجسم السليم - فإننا نضيف إليها مقولة أخري وهي أن القلب السليم في الجسم السليم ، فحافظ علي جسمك تحافظ علي قلبك. "

Our translation

“If the truth is in the fact that, the proverb **‘A sound mind in a sound body’** ,which is well known by everyone and applied by only some of them; so we add for it another proverb that means ‘ A sound heart in a sound body’. By protecting your heart, you protect your body.”

- **A sound mind in a sound body = العقل السليم في الجسم السليم**

‘*A sound mind in a sound body’* is the English translation of a famous Greek origin quotation (mens sana in corpora sano) **.** It insists that, the mind and the body should be both healthy and sound because of the close links between them. A sound mind is a mind capable of good, positive and free thinking. A healthy body is obtained by maintaining a good diet and a good exercise.

In our translation, we chose the quotation ‘*A sound mind in a sound body’* to translate a famous Arabic proverb ' العقل السليم في الجسم السليم' because both proverbs are very similar in

meaning and transmit the same message. The mind and the body are interconnected and work together.

- **The meaning of the proverb " العقل السليم في الجسم السليم"**

The explanation of the proverb " العقل السليم في الجسم السليم" in the website 'mawdoo3' is as follow:

" مما لا شك فيه أن سلامة الجسد تؤثر في سلامة العقل،وبالتالي علي لإنسان أن يحرص علي أن يبقي جسده سليما معافا حرصه علي بقاء عقله سليما معافا كذلك، ويكون ذلك بعدة أمور منها : التغذية السلمية..." (http://www.mawdoo3.com visited on 26/11/2019)

That means that: "It is that the healthy body affected the sound mind, so people should take care of their body and mind. For instance, by consuming healthy food…"

(Our translation)

The procedure used in translating the proverb used by the author into English is equivalence. we have selected an English expression which transmits the same reality with the given one .

Example two

The original text

"وجدير بالذكر أن درجة الضيق في الشريان التاجي لا تعتبر مؤثرة حتى يصل الضيق إلي أكثر من 50% ،عندئذ فقط قد يبدأ حدوث قصور في أداء هذا الشريان حيث تصبح كمية الدم المتدفقة عبره غير كافية لتلبية احتياجات عضلة القلب و حينئذ يبدآ المريض في المعاناة من أعراض قصور في تغذية القلب (ما يسمي بالذبحة الصدرية)."

Our translation

"It is important to mention again that, narrowing degree in the coronary artery will only be effective in more than 50% . In this case, coronary failure starts and the blood flow becomes insufficient for the heart muscle. The patient starts to suffer from cardiac hypoperfusion symptoms (this is called **angina**)" (Our translation)

a- Angina = الذبحة صدرية

- **The definition of the word ‘ angina’ in English**

According Davidson (2010), Angina is a sense of crashing pain in the chest and neck which classically extends to the left arm that comes on typically when exercising. This can include everyday physical effort, not just activities such as jogging! The pain gets better when you rest. Angina is associated with CAD (coronary artery diseases).

In our translation, we have translated the Arabic term 'الذبحة الصدرية' by using its equivalent in English that is ‘angina’.

- **The definition of the word 'الذبحة الصدرية' in Arabic**

The definition of the word " الذبحة الصدرية" according to the dictionary " معجم الأمراض وعلاجها" is as follow :

" الذبحة الصدرية عبارة عن الم صدري حاد ومفاجئ يحدث بسبب وجود تضييق جزئ او انسداد في الشريان التاجي أو بسبب حدوث تشنج في الشريان ينتج عنه نقص في التروية الدموية للعضلة القلبية حيث يتم نقل الأوكسجين إلي القلب في الدم المتدفق عبر الشرايين التاجية ."

(http:// onlotology.birzeit.edu/tem/الذبحة الصدرية visited on 23/11/ 2019)

This means that: “Angina is a sudden acute chest pain caused by partial narrowing or blockage of the coronary artery or by spasm in the artery or the lack of blood perfusion of the heart muscle where oxygen is transferred to the heart in the blood flowing through the coronary arteries.” (Our translation)

The procedure used in this example is equivalence. We have used one term to translate the Arabic phrase but both of them, the Arabic and the English terms, transmit the same reality. The terms (الذبحة الصدرية = angina) are different expressions; however the same heart disease is rendered by using two different texts.

Example three

The original text

الحكمة الصينية تقول :

- استمتع بإفطارك.
- واقسم غذاءك مع جارك.

- وأعط عشاءك لعدوك!

Our translation

An English proverb says :

- Eat breakfast like a king
- Lunch like a prince,
- and dinner like a pauper

- **Russian proverb = English proverb**

In our translation, we selected the American proverb '*Eat breakfast like a king, Lunch like a prince and dinner like a pauper'* to translate a famous Russian proverb translated into Arabic used by the author ' استمتع بإفطارك واقسم غذاءك مع جارك وأعط عشاءك لعدوك! ' because both of them convey the same moral which is, the most generous meal must be in the morning and eating much in the evening is harmful.

The proverb above mentioned " استمتع بإفطارك واقسم غذاءك مع جارك وأعط عشاءك لعدوك! " is an old Russian proverb " За́втрак съешь сам, обе́д раздели́ с дру́гом, у́жин отда́й врагу́ ". It is not a Chinese proverb as the author mentioned in his book. The English translation of this proverb is, *" Eat breakfast yourself, share dinner with your friend, give the supper to your enemy.*" The moral of this proverb is that eating a rich and healthy meal is encouraged at breakfast and is permissible during lunch, dinner should contain only fluids or it is better to be avoided.

The English version of the Russian proverb is, *" Eat breakfast like a king lunch like a prince and dinner like a pauper."*The idea of the American proverb was come from an old proverb '*Butter is gold in the morning, silver at noon, and lead at night* ' printed in "*The Haven of Health*" (1584) by Thomas Cogan. An American author and nutritionist Adelle Davis changed '*gold, silver, lead*' to '*king, prince, pauper*'. She suggested that a proper diet should have bigger breakfasts, when energy is needed throughout the day and lighter in dinner.

(https://gmatclub.com visited on 23/10/2019)

The procedure used to translate the proverb using by the author from Arabic into English is equivalence. The American quotation transmits the same message with the Russian proverb used by Dr. Aymen Abu El Magd.

2-2- Transposition

Example one

The original text

" وبالطبع فان السؤال الذي يفرض نفسه هنا هو : ماذا يحدث عند إصابة الشرايين التاجية ؟

أولا يبدأ المريض في الشكوى مرة ثانية من عودة بعض لأعراض مثل آلام في الصدر و ضيق بالتنفس. "

Our translation

"Of course the pertinent question that raised is : what happens when the CAs are affected ? First, the patient starts to complain again because some symptoms such as pain in the chest and breathlessness **have come back**."

- **Have come back = عودة**

The definition of the word 'to come back' in English dictionary is: "To return to a former state.." (http://en.wikitionary.org visited on 11/12/2019)

In out translation, we have replaced the Arabic word 'العودة ' with an English word *'have come back'* without altering the meaning of the source text.

- **The definition of the word ' العودة' in the Arabic dictionary**

The meaning of the word in the Arabic dictionary is as follow:

" عاد إليه، وله ... ، و عودة : رجع وارتد. "

(http://www.maajim.com visited on 11/12/2019)

This means that: " come back to/ for him or her, …come back : to return."

(Our translation)

In this example, we have chosen the method called transposition in order to translate the sentence ' أولا يبدأ المريض في الشكوى مرة ثانية من عودة بعض لأعراض ' This latter can be re-expressed by transposing a noun in the source text with a verb in the target text " First, the patient starts to complain again because some symptoms … **have come back**." and keeping the meaning as it is in the source text.

Example two

The original text:

" ونستطيع أن نقوم بتحديد عدد مرات الضخ بقياس النبض عند المعصم، ويختلف هذا العدد من شخص لأخر، فرغم أن المتوسط ٧٠ مرة في الدقيقة فالحقيقة انه يختلف من شخص لآخر."

Our translation

"We **can determine** the number of pumping times by measuring the pulse at wrist. The number differs from one another, although the average is 70 beats per minute."

- **Can determine =نقوم بتحديد**

The definition of the word " to determine" in the English dictionary is: " To ascertain definitely; to figure out, find out, or to conclude by analyzing."

(http://en.wikitionary.org visited on 09/12/2019)

In our translation, we have replaced the Arabic word class 'نقوم بتحديد' with a different English word class, *'can determine'* without altering the meaning of the source text.

- **The definition of the word 'تحدد ' in the Arabic dictionary**

The meaning of the word ' تحدد ' in the Arabic dictionary ' maajim' is:

"تحديد : حدد الشيء : عينه، حدد الثمن."

(http://www.maajim.com visited on 23/11/2019)

This means that : " Determine: to determine something: specificate, to price up."

(Our translation)

In this pattern, we have used transposition procedure to substitute one word class with another, "ونستطيع أن **نقوم بتحديد** عدد مرات الضخ بقياس النبض عند المعصم" can be re-expressed by

transposing a noun with a verb as follow, 'We **can determine** the number of pumping times by measuring the pulse at wrist.' As we can notice, the source text and the target text convey the same meaning.

Example three

The source text

"وكذلك ظهرت بعض الحالات الناتجة عن استخدام حبوب منع الحمل والتي من المعروف عنها أنها قد تساعد علي تكوين الجلطات عند البعض كما ترفع معدل الكولسترول الضار و ضغط الدم."

"Some cases appeared as a result of using **contraception** which is known that it can help forming clots for some people. Moreover, it rises the rate of LDL and blood pressure."

- **Contraception= حبوب منع الحمل**

"Contraception (birth control) prevents pregnancy by interfering with the normal process of evaluation, fertilization, and implantation. There are different kinds of birth control that act at different points in the process." (http://medical-dictionary.thefreedictionary.com visited on 23/11/2019

In our translation, we have replaced the Arabic word class which is ' حبوب منع الحمل ' with a different English word class, ' *contraception'* and keeping the same meaning of the source text.

- **The definition of the word** "حبوب منع الحمل " **in Arabic**

The meaning of the word "حبوب منع الحمل " in the Arabic dictionary ' maajim' is:

"حبوب الإمساك عن الحمل ولإعاقته ."

(http://www.maajim.com visited on 23/11/2019)

This means that : "Contraception pills for pregnancy and hamper it." (Our translation)

In the example mentioned above, we have used transposition procedure to substitute one word class with another, "وكذلك ظهرت بعض الحالات الناتجة عن استخدام **حبوب منع الحمل**" can be reformulated by transposing a phrase with a noun as follow, ' Some cases appeared as a result

of using **contraception**.' As we can notice, the source text and the target text have the same meaning.

2-3- Modulation

Example one

The source text

" . . . هناك بعض المضاعفات الخاصة جدا باستخدام الليزر مثل اختراق شعاع الليزر لجدار الشريان وهذا يحدث في حوالي ١,٨٪ من الحالات وهي نسبة قد تبدو لأول وهلة بسيطة جدا لكن إذا ما تمت موازاتها بالبالون فهي تعتبر نسبة مرتفعة جدا."

Our translation

" … There are some very particular complications in using laser. For instance, when laser's radium passes through the artery wall. This happens in about 1, 8 % cases and the percentage seems for the first time **not complicated at all** but if it's compared to the balloon it will be considered very high."

- **Not complicated at all = بسيطة جدا**

The definition of the word ' complicated' in English dictionary is: " Difficult or convoluted" and not complicated means not difficult or not convoluted.

(http://en.wikitionary.org visited on 09/12/2019)

In our translation, we have changed the form of the source text which is

" نسبة قد تبدو لأول وهلة بسيطة جدا " by introducing a semantic change in the source text as follow, "*The percentage seems for the first time not complicated at all.*"

- **The definition of the word ' بسيط جدا' in Arabic**

The meaning of the word 'بسيط جدا ' in 'almaany dictionary' is as follow :

"البسيط :ما لاتعقيد فيه"

(http://www.almaany.com visited on 09/12/2019)

That means that: " simple : means it has no complications." (Our translation)

In this example, the procedure that we applied in our translation is free or optional modulation. we have selected a type of modulation which turns a positive source language expression, which is "بسيطة جدا ..." into negative target language expression *"...not complicated at all."* The structure of both sentences is closely linked to each other.

Example two

The original text

"ولقد كانت الصعوبة الكبرى التي واجهتها هي صعوبة التوفيق بين اعتبارات الدقة العلمية والالتزام في عرض الحقائق الطبية بالمنهج البحثي الصارم ، وبين اعتبارات التبسيط والتشويق اللذين يشدان القارئ إلي متابعة القراءة ..."

Our translation

"I faced the biggest difficulty. **is not easy** to accommodate between the science accuracy regards and the commitment in presenting medical facts with a rigorous research methodology; also between the simplification regards and the suspense that attracts the reader's attention to follow reading…"

- **Is not easy = الصعوبة**

The meaning of the sentence ' is not easy' in English language is: " Difficult, hard, uneasy, ..."

(http://en.wikitionary.org visited on 09/12/2019)

In our translation, we have altered the form of the source text which is

"ولقد كانت الصعوبة الكبرى التي واجهها هي صعوبة التوفيق..." by introducing a semantic alter in the target text as follow "*It is not easy to accommodate between the science accuracy regards…"*

- **The meaning of the word 'الصعوبة' in Arabic**

The definition of the word 'صعوبة' in Arabic dictionary ' almaany' is :

"صعوبة : وجد صعوبة في عمله : مشقة ."

(http://www.almaany.com visited on 09/12/2019)

That means that: “difficulty: he found difficulties in his work: discomfort.”(Our translation)

In this example, the procedure that we have applied in out translation is optional modulation. We have selected a type of modulation which turns a positive source language expression, which is "الصعوبة" into negative target language expression *“it is not easy”*. The structure of the expression in the SL is almost the same with the one of the TL.

3. Remarks:

The book: *"أمراض القلب وشرايينه التاجية"* is written in Arabic to help the Egyptian people to understand heart diseases and to raise awareness. Therefore, the author has given English equivalents to some words in order to help the readers to get the accurate meaning.

Examples

- **الصمام الميترالي (Mitral Valve) :** in this example, the author added the English equivalent and he borrowed the name of the valve ‘*mitral*’ from English into Arabic "الميترالي" (The ‘mitral valve’ is so named because of its resemblance to cardinal’s hat, known as mitre.) and there are other example such as, *الصمام الأورطي (Aortic Valve), مثبطات بيتا (Beta blockers)* etc.
- **ذبحة صدرية مستقرة (Stable Angina) :** in this example, the author added the English equivalent next to the Arabic one. There are other examples such as: *جلطة بالشريان التاجي (Myocardial Infraction), الصمام الثلاثي الشرفات (Tricuspid Valve), الصمام الرئوي (Pulmonary Valve)* etc.
- **لوبيد (Lopid), بيزاليب (Bezalip)** are names of drugs can be used to rise the level of the good cholesterol in blood. In addition, there are other names of drugs can be used to reduce the level of bad cholesterol in blood, such as: *كولستيرامين (Cholestyramine), كوليستبول (Cholestipol), نياسن (Niacin)* etc.
- الدعامة (Stent) is a fine wire mesh that is stretched over a balloon, used to hold tissue in place. There are also other devices mentioned by the author in both languages, in Arabic and followed by their equivalent in English written between parentheses such as: الليزر (Laser) and الشينيور (Rotablator).
- التدخل الجراحي (CABG) : it’s the abbreviation of coronary artery bypass graft . Abbreviations are not common in the Arabic language. However, they are widely spread in medical terminology so the author has used some of them to reinforce the information. There are other examples such as: الكولسترول المفيد (HDL) High – density lipoprotein, الكولسترول الضار

(LDL) Low-density lipoprotein , أ . لاي بوبروتين { Lp (a) } any complex or compound containing both lipid and protein.

الهبارين المكون من جزيئات خفيفة الوزن (LMW – Heparin) Low molecular weight heparin.

Conclusion

To conclude with, in this chapter we have introduced our attempt to translate different extracts carefully selected from the corpus " أمراض القلب وشرايينه التاجية " with a commented translation. As regards the appropriate translation method we have chosen is comparative stylistics. Literal translation and equivalence are the most useful strategies. Literal translation is suitable, when it is possible, for translating medical terminology from Arabic into English. Moreover, we tended to use equivalent strategy in case a suitable equivalent for an expression in the source text is available in the target language to make it readable for the target language readers. We have noticed in our study that in some cases one or more strategies suggested for each field. It does not mean that we have to choose only a certain method or strategy of translation. The translator should choose an appropriate strategy taking into consideration the characteristics of medical language which are clarity, objectivity, accuracy and conciseness. It is concluded that, the translator faces many obstacles to render the same meaning and the same effect of the source text.

General conclusion

Conclusion

All in all, through our study of the corpus "أمراض القلب وشراييه التاجية" written by Aymen Abu El Magd. It was clear enough that terminology is part of medicine, whereof to translate a cardiological text, terminology should be known. Translators encounter many obstacles while translating medical terms within medical texts on cardiology. For this reason, understanding cardiopathic terms and interpret them through the receiver's language is a task should be done by translators who have a wide knowledge of the methods and the techniques of translation as well as to have a good command of medical language.

In this study, we have carefully selected the medical terms existing in the corpus then translated them by choosing the appropriate strategies to convey their accurate meaning.

The two basic methods and the most convenient strategies that we have adopted from comparative stylistics are, direct translation and free translation. Direct translation is one of the most suitable methods for translating medical terms from two completely different languages such as Arabic and English. In most situations, it permits the translator to render the same meaning and respect the characteristics of medical texts. This method includes: literal translation. We have used free translation method in cases a suitable equivalent is available in the target language or the same idea can be re-expressed differently and without altering the meaning of the original text. This method includes: transposition, modulation and equivalence. We noticed that using these strategies is effective in many cases so that the translation is meaningful and tangible. The analyses of the examples in this paper shows that we used direct translation more than free translation, however, the two methods are complement each other. It is obvious that we have to choose the appropriate strategy based on context and purpose. The study shows that the difficulties we faced through the process of translation are related to the unfamiliarity with medical terminology in general and cardiopathic terminology in particular. In addition, in some cases, none of these strategies can be applicable or the example is not clear so the translator will be confused which strategy should follow! Therefore, any misuse of the techniques of translation may lead to a poor translation. Only when the translator chooses direct translation and oblique translation, and combines them appropriately, they can bring a satisfactory translation to the readers. Finally, we come to conclude that, translating a medical text is a difficult task especially when source and receptor languages are different. It was difficult, although not as difficult as we

had expected and the main reason is the fact that the theme is very interesting and motivating. On the light of this study, we shall propose other relevant topics to be discussed in a dissertation, such as

- Analyzing the translated medical terms within the book " أمراض القلب و شرايينه التاجية "
- Applying other strategies such as Ghazal's mechanisms for translating medical terms into Arabic within the same book.

The fact that the book has never been translated into English language or studied before makes it an interesting one.

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Appendixes

English-Arabic Cardiopathic terms Glossary

A	
Affix	زائد
Anatomy	تشريح
Anemia	فقر الدم
Angina	ذبحة صدرية
Angioplasty	راب الوعاء
Aorta valve	صمام أورطي
Aortic stenosis	تضييق أورطي
Arteriosclerosis	تصلب الشريان
Arthritis	التهاب المفصل
Atrium	أذين
B	
Bicuspid	ميترالي
Biochemistry	كيمياء حيوية
Breastbone	عظمة الصدر
Bypass	مجازة
C	
Calculus	حصاة كلوية
Capillaries	أوعية الشعرية
Cardiac	له علاقة بالقلب
Cardiac hypoperfusion	قصور في تغذية القلب
Cardiology	طب القلب
Cardiopathy	مرض القلب
Cardiovascular	قلب ووعاء دموي
Clinical report	تقرير سريري
Clot	جلطة
Combining form	صيغة مؤتلفة
Complication	مضاعف
Concise	مختصر
Coronary artery	شريان التاجي
Cortex	قشرة
Cusps	قرني الهلال

D	
Diastole	تمدد القلب
Drug	دواء
E	
electrocardiogram	تخطيط القلب الكهربي
eponym	مسمي علي اسم
G	
Ganglion	كتلة عصبية
Gastroenteritis	التهاب المعدة والمعاء
Genecology	طب النساء
Genetic engineering	هندسة وراثية
H	
Healthcare	خدمة طبية
Heart attacks	نوبة قلبية
Heartbeat	نبض القلب
Hematology	طب مرض الدم
I	
infix	داخل
L	
Lay reader	قارئ بسيط
Leak	تسرب
M	
Medical terminology	مصطلح طبي
Mitral valve	صمام ميترالي
N	
Natural language	لغة طبيعية
Neurology	طب مرض العصب
Nutshells	شيء صغير الحجم
O	
Organ	عضو
P	
Peptic ulcer	قرحة لاثنتي عشرة
Pertaining to	منسوب إلي

physiology	علم وظيفة العظو
Prefix	سابق
Pulmonary valve	صمام رئوي
pulse	نبض
R	
Rotablator	شنيور
S	
Septum	حاجز
Sound	معافى
Stent	دعامة
Stretch	اتساع
Stroke	سكتة دماغية
suffix	لاحق
Superior vena cava	وريد أجوف علوي
Symptom	عارض
Systole	انقباض القلب
T	
Technical language	لغة تقنية
Tissues	نسيج
Tractable	سلس
Trans-esophageal echocardiogram	مخطط صدي القلب عبر المريء
Tricuspid valve	صمام الثلاثي الشرف
V	
Ventricle	بطين
Vessel	وعاء دموي
W	
Word root	جذر الكلمة

مسرد عربي – انجليزي للمصطلحات المتعلقة بطب القلب

أ	
اتساع	Stretch
أذين	Atrium
العارض	symptom
النسيج	Tissue
انقباض القلب	systole
الوعاء الشعري	Capillary
الوعاء الدموي	Vessel
ب	
بطين	Ventricle
ت	
تخطيط القلب الكهربي	Electrocardiogram
تسرب	leak
تشريح	Anatomy
تصلب الشريان الأورطي	Arteriosclerosis
تضييق الأورطي	Aortic stenosis
تقرير سريري	Clinical report
تمدد القلب	diastole
التهاب المعدة والمعاء	Gastroenteritis
التهاب المفصل	Arthritis
ج	
جذر الكلمة	Word root
جلطة	Clot
ح	
حاجز	septum
حصاة كلوية	Calculus
خ	
خدمة طبية	Healthcare
د	
دعامة	Stent
دواء	drug

داخل	Infix
ذ	
ذبحة صدرية	Angina
ر	
راب الوعاء	Angioplasty
ز	
زائد	affix
س	
سكتة دماغية	Stroke
سلس	Tractable
سابق	Prefix
ش	
شريان تاجي	Coronary artery
شنيور	Tabulator
شيء صغير الحجم	Tractable
ص	
صمام أورطي	Aortic valve
صمام ثلاثي الشرف	Tricuspid
صمام رئوي	Pulmonary valve
صمام ميترالي	Mitral valve
صيغة مؤتلفة	Combining form
ط	
طب مرض الدم	Hematology
طب المرض العصبي	Neurology
طب القلب	cardiology
طب المرأة	Genecology
ع	
عضو	Organ
عظام الصدر	Breastbones
علم وظيفة العضو	Physiology
ف	
فقر الدم	Anemia
ق	

Lay reader	قارئ بسيط
Peptic ulcer	قرحة الإثنتي عشرة
cusps	قرني الهلال
Cortex	قشرة
Cardiac hypoperfusion	قصور في تغذية القلب
Cardiovascular	قلب وأوعية دموية
ك	
Biochemistry	كيمياء حيوية
ل	
Natural language	لغة طبيعية
Technical language	لغة تقنية
Pertaining to	له علاقة
Suffix	لاحق
م	
bypass	مجازة
Concise	مختصر
Trans-esophageal echocardiogram	مخطط صدي القلب عبر المريء
cardiopathy	مرض القلب
Eponym	مسمي علي اسم
Medical terminology	مصطلح طبي
Complications	مضاعف
Sound	معافى
Pertaining to	منسوب إلي
Bicuspid	ميترالي
ن	
Pulse	نبض
heartbeat	نبض القلب
Heart attacks	نوبات قلبية
ه	
Genetic engineering	هندسة وراثية
و	
Superior vena cava	وريد أجوف علوي

Appendix-B -

List of tables

Table 01: the most common abbreviations ……16

Table 02: examples of English eponymous terms ……24

Appendix-C-

List of figures

Figure one: cardiac chambers and valves ……8

Figure two: diagram of blood flow through the heart ……9

Figure three: elements of a combining form ……..…12

Figure four: elements of medical words ……13

Appendix-D-

List of abbreviations and acronyms

4GL: Fourth Generation Language

Ac: Before meals

AMA: American Medical Association

AS: Arteriosclerosis

AS: Aortic Stenosis

B2B: Business for Business

CABG: Coronary Artery Bypass Graft

CAD: Coronary Artery Diseases

CAD: Coronary Artery Diseases

CAs: Coronary Arteries

CHD: Coronary Heart Disease

CTs: Cardiac Texts

ECC: Emergency Cardiovascular Care

ECG: Electrocardiogram

ENT: Ear, Nose, throught

ER: Emergency

G2: group 2

GoF: Gang of Four

H/A: Headache

HDL: High- Density Lipoprotein

LDL: Low- Density Lipoprotein

LMW: Low Molecular High

LP (a): Any Lipid and Protein

MI: Myocardial Infraction

NATO: National Atlantic Treaty Organization

NILES: The National Institute of Laser Enhanced Science

NYHA: New York Health Association

SL: Source Language

ST: Source Text

Sx: Symptoms

TL: Target Language

TLA: Three Letters Acronyms/ abbreviation

TOE: Trans-esophageal Echography

TT : Target Text

UNESCO: United Nations Educational, Scientific and Cultural Organization

USA: The United States of America

W3C: World Wide Web Consortium

WHO: World Health Organization

Y2k: For Year 2000

Abstract

The present paper is about the translation of cardiological terms and the difficulties faced by translators in the translating process of technical works. As a corpus to this study, we have chosen a book on cardiology then we selected some passages from the corpus which contain medical terms. These terms caused difficulties in transferring the meaning from the source text to the target one. The study aims at demonstrating the importance and the difficulties of translating medical terms especially on cardiology. Understanding cardiological terms and finding their equivalent in the target text are the main problems faced by translators. Comparative stylistics methods are the convicting techniques used in translating medical terminology in order to convey the meaning of the source language. Our paper is entitled, "The study of cardiological terminology-related difficulties and problems in medical translation. The book " أمراض القلب وشراييه التاجية", in English ' *Heart diseases and its coronary arteries'* ,written by Aymen Abu El Magd is the case study". In our translation we have encountered difficulties caused by the differences between the two languages and the unfamiliarity with the medical terms. Trough our research study we have noticed that, translating cardiological terms from Arabic into English and selecting a proper method is a complicated task .

الملخص

تتمحور دراستنا حول ترجمة المصطلحات المتعلقة بطب القلب والصعوبات التي تواجه المترجم أثناء ترجمته لنصوص التقنية. كنموذج لدراستنا، اخترنا كتاب عن طب القلب. وقد ترجمنا بعض المقاطع المنتقاة من النموذج والتي تتكون من مصطلحات طبية. وهذه الأخيرة يصعب ترجمتها من نص الأصل إلي نص الهدف. تهدف دراستنا لعرض أهمية النص الطبي والصعوبات التي يواجهها المترجم في ترجمة نص خاص بطب القلب. فهم المصطلحات الطبية وإيجاد مقابل لها في لغة الهدف تعد من أهم الصعوبات التي يواجهها المترجم . تعد أساليب المقارنة من بين الأساليب المناسبة لترجمة النصوص الطبية لنقل المعني إلي نص الهدف. بما آن هذا العمل مبني علي ترجمة مقاطع تحتوي علي مفردات خاصة بمجال طب القلب فان الإطار ألمفاهيمي لهذه الدراسة هو "دراسة الصعوبات والمشاكل الناتجة عن ترجمة نص متعلق بطب القلب و كتاب " أمراض القلب وشراييه التاجية" ، باللغة الانجليزية *" Heart diseases and its coronary arteries"* ،أنموذجا لدكتور أيمن أبو المجد". لقد واجهتنا عوائق سببها الاختلاف الكبير بين اللغتين وكذلك عدم التمكن من المصطلحات الطبية. خلال دراستنا لاحظنا أن ترجمة وتحليل المصطلحات المتعلقة بطب القلب من اللغة العربية إلي اللغة الانجليزية اختيار منهجية مناسبة عمل غير هين.