THE TRANSLATION OF

ENGLISH MEDICAL TERMS INTO PERSIAN

by

ALI AKBAR ZEINALI

Thesis submitted in fulfillment of the requirements

for the degree of

Master of Arts

May 2009

To: My parents,

My wife, Helen,

My son, Aryan and my daughter, Jasmine.

ACKNOWLEDGEMENTS

Although it is a stimulating and motivating experience, completing a master degree takes a lot of effort, time and energies. There are therefore several people I would like to thank for helping me proceeding through this process. It is only now that I have acquired the wisdom to truly understand the value of their work. While many of these individuals have been mentioned in these pages, there are still many others whose names do not appear but whose assistances are equally important. Without their kind efforts, this thesis might not have been possible.

First of all, I would like to thank my supervisor, Dr. Rokiah Binti Awang and my co-supervisor, Dr. Hasuria Binti Che Omar. Without their invaluable guidance, this thesis would surely have not been the same. Thanks for their time, energies, enthusiasm and advices, for teaching me to be independent in my research, for helping me develop my critical spirit, and also simply for being such good supervisors. It has been a great pleasure for me to collaborate with them. Also, I wish to acknowledge all of the lecturers and guides who helped to direct me along the path of my study that has helped to make this thesis a reality.

A very special thank to Mr. Amiri in Iran, for his constant assistance whenever I needed. I would also like to acknowledge Mr. Salimi and Ms. Sammak in Iran for providing me with the materials and sources required in my research by sending via email, especially my target text which was not available here. I would like to thank Yoga Latha for translating my abstract into Malay, and Caitlin Jane Reynolds Foote who has reviewed and edited my work in a very short period with her insightful comments.

I am very grateful to all my kind friends who provided me with the atmosphere which has always been a perfect source of motivation. I thank them also for taking care of me when I was feeling a bit down and when I was ill in Penang Hospital, I appreciate them all.

Let me thank my parents for their support throughout my study, without whom I would ever have been able to achieve so much. I cordially thank my son, Aryan, for not forgetting me, even though he had few, if any, chances to see me.

I especially wish to express my love for my wife, Betty (Helen), who knows the real price of this dissertation as we suffered and paid it together. She spent alone many months while bearing our second child and we were expecting her heartwarming arrival to this world. Without her support, this thesis would not have been possible. I thank her for her endless love, patience, and understanding.

TABLE OF CONTENTS

Page

CHAPTER FIVE - CONCLUSION

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

b	Borrowing
c	Compounding
d	Derivation
e	Eponym
E	Expansion
L	Literal Translation
N	Naturalization
Pr	Paraphrase
r	Root
S	Shift
SL	Source Language
Su	Substitution
T	Through Translation
TL	Target Language
TP	Translation Procedure
WFP	Word Formation Process

LIST OF SYMBOLS

Persian Alphabet and International Phonetics

A. Consonants

Persian Alphabet (Arabic letter)	Persian Alphabet (Latin letter)	Phonetic Alphabet (IPA)	Example in Persian	Pronunciation
ا- ع	?	/ʔ/	ʔeltehāb	/ʔelteha:b/
ب	b	/b/	bāzu	/ba:zu/
پ	p	/p/	pā	/pa:/
ت- ط	t	/t/	ʔeltehāb	/ʔelteha:b/
ث- س- ص	s	/s/	dast	/dæst/
ج	j	/dʒ/	jomjome	/dʒomdʒme/
چ	č	/tʃ/	moč	/motʃ/
ح- ه	h	/h/	ʔeltehāb	/ʔelteha:b/
خ	x	/x/	xāji	/xa:dʒɪ/
د	d	/d/	dard	/dærd/
ذ- ز- ض- ظ	z	/z/	ʔazole	/ʔæzole/
ر	r	/r/	tumur	/tumur/
ژ	ž	/ʒ/	može	/moʒe/
ش	š	/ʃ/	šāne	/ʃa:ne/
غ- ق	q	/ʁ/	maqz	/mæʁz/
ف	f	/f/	mafsal	/mæfsæl/
ک	k	/k/	šekastan	/ʃekæstæn/
گ	g	/g/	ʔangošt	/ʔængoʃt/
ل	l	/l/	ʔeltehāb	/ʔelteha:b/
م	m	/m/	maqz	/mæʁz/
ن	n	/n/	ʔangošt	/ʔængoʃt/
و	v	/v/	ʔeving	/ʔevɪng/
ی	y	/j/	bāzuyi	/ba:zujɪ/

B. Vowels

Persian Alphabet (Arabic letter)	Persian Alphabet (Latin letter)	Phonetic Alphabet (IPA)	Example in Persian	Pronunciation

-	a	/æ/	maqz	/mæʁz/
-	e	/e/	šāne	/ʃa:ne/
-	o	/o/	?angošt	/?ængoʃt/
آـ ا	ā	/a:/	bāzuyi	/ba:zujɪ/
ای - ی	i	/ɪ/	bāzuyi	/ba:zujɪ/
او - و	u	/u/	bāzuyi	/ba:zujɪ/

PENTERJEMAHAN ISTILAH

PERUBATAN BAHASA INGGERIS KE DALAM BAHASA FARSI

ABSTRAK

Kajian ini menganalisis dan membandingkan istilah-istilah perubatan di dalam bahasa Inggeris (BS) dan Farsi (BT) dari segi proses pembinaan kata dan prosedur terjemahan. Kajian ini juga mengkaji istilah tersebut dari segi proses penterjemahan yang digunakan. Sampel dalam kajian ini melibatkan pemilihan istilah perubatan (penyakit dan prosedur) daripada ICD-9-CM dan padanannya yang terdapat dalam "Guide to ICD-9-CM in Persian".

Seterusnya, istilah BS dan BT ini telah dinilai dan ini diikuti dengan analisis perbandingan. Gabungan kedua-dua istilah ini telah memberikan suatu data yang telah membolehkan penyelidik untuk melakukan analisis kuantitatif and kualitatif terhadapnya. Data yang telah dikumpul termasuklah suatu populasi berjumlah 408 istilah perubatan dalam bahasa Inggeris yang merupakan teks sumber dan padanannya dalam teks sasaran.

Kajian ini menunjukkan bahawa pelbagai jenis prosedur penterjemahan digunakan dalam bahasa Farsi seiring dengan proses pembentukan kata yang sedia ada. Prosedur penterjemahan yang sering digunakan ialah prosedur penggantian. Prosedur ini merangkumi lebih kurang 62% daripada istilah tersebut, tanpa mengambil kira kemungkinan prosedur bersama. Dari segi proses pembentukan kata, proses yang jelas kelihatan digunakan dengan paling kerap dalam kajian ini ialah peminjaman (60%), dan bahasa yang paling banyak dipinjam ialah bahasa Arab

(40%). Selain daripada itu, penemuan dalam kajian ini telah mengenal pasti kewujudan masalah yang melibatkan keupayaan penggabungan dalam bahasa Farsi. Padanan BT dalam kajian ini wujud sebagai frasa sintaksis sementara pasangan BS pula hanya terdiri daripada satu patah perkataan.

Kesimpulannya, perbezaan dan persamaan antara BS dan BT yang dikenal pasti hadir dalam kajian ini adalah dari segi segi pembentukan ayat, contohnya, "peminjaman, pengkompaunan, penerbitan dan eponim". Prosedur penterjemahan yang sering diaplikasikan untuk menterjemahkan istilah yang sama ialah "terjemahan langsung, anjakan dan penggantian". Hal ini menunjukkan bahawa dalam sesetengah kes tidak wujud padanan istilah bahasa Farsi yang sesuai dengan istilah perubatan bahasa Inggeris yang digunakan.

THE TRANSLATION OF

ENGLISH MEDICAL TERMS INTO PERSIAN

ABSTRACT

This study analyses and compares the medical terms in English (SL) and Persian (TL) from the word formation processes (WFPs) and the translation procedures (TPs) perspectives. The sample of the study involved a selection of medical terms (diseases and procedures) from ICD-9-CM and the equivalents provided in "Guide to ICD-9-CM in Persian".

The SL and the TL terms were subjected to evaluation, followed by a comparative analysis. These pairs provided the data which enabled the researcher to perform the statistical descriptive and qualitative analysis. The collected data included a population of 408 English medical terms from the source text and their pairs from the target text.

The analysis indicated that Persian applies a variety of TPs in accordance with the available WFPs. The most frequently applied TP is substitution. It constitutes of about 62% of the terms, regardless of any other probable simultaneous procedure. Moreover, with respect to WFPs, the most observable process in this study is borrowing (60%), in which process—borrowing—the most applied language is Arabic (40%). On the other hand, the findings of this study indicated that there is a problem with combinational potentiality of Persian. The TL equivalents in this study usually appeared as phrase syntax, while their SL pairs have single words.

In conclusion, for the medical terms chosen in this study, this research can be highlighted by some differences and similarities found between the SL and the TL with respect to WFP, like “borrowing, compounding, derivation and eponym”. Furthermore, the most frequently applied TPs for rendering the same terms are “through translation, shift and substitution”. It indicates that there is no appropriate Persian equivalent for medical terms in some cases.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

Mechanically speaking, translation is a process of putting the 'sense of words or text' (The Oxford English Dictionary, 2001: 1969) of one language into another language, the product of which is the result of translation. By dictionary definition, translation is a process consists of changing from one state or form to another, to turn into one's own or another's language (The Merriam-Webster Dictionary, 1994). When we speak of the form of a language, we are referring to the actual words, phrases, clauses, sentences, paragraphs, etc., which are spoken or written.

These days, translation professionals need to be technically well-informed and linguistically talented people who possess a clear understanding of the issues involved in dealing with a text across boundaries of language and culture.

According to Nida & Taber (1969: 12) "Translating entails reproducing in the receptor language the closest natural equivalent of the source-language message; first in terms of meaning and secondly in terms of style". The aim of the translation is mainly to reproduce the message as a whole rather than to focus on associating with similar meanings between the source-language and the target language. They continue that a good translation, in their opinion, is a translation which does not look like a translation. Newmark describes medical translation as follows:

> Medical writing is primarily for doctors and is also read by nurses and students, while general medical articles and advertising are written for intelligent laymen. In both types of publication the translator is likely

> to have an aim similar to that of his author(s) unless he is translating for a medical readership with less knowledge than his author's. The content of medical reports and articles will usually not be specific to the source language culture, provided both it and the target language culture are set in developed countries. Hence some of the translator's problems-how to translate a word for a feature that does not exist in his own country, or the expression of the first writer's feelings, or a sound effect do not usually arise in medical translation. Tropical medicine translation presents few additional problems because researchers from developed countries have created- the terminology and adopted the local terms. For all that, medical translation can be as complex, challenging, and difficult as any other kind of translation.
>
> (Newmark, 1979: 1405-7)

Translators handling medical texts do not have to be trained as doctors or nurses. However, they have to understand all the associated implications – the linguistic, medical, social, and cultural contexts in which they work. This requirement of the translator is to have sufficient knowledge to assume the role of the communicator of the source text (writer, speaker, etc.), the listener or reader in the target language. In a medical context, communication is central to both professionals and patients. General practitioners, for example, have to infer what the patients are trying to say and they must grasp the hints that patients may drop about ailments that worry them. General practitioners must also explain to patients what is wrong. Therefore, according to Mercy, "good doctors believe that being able to discern hidden meaning in what their patients say is one of their skills" (Mercy, 2005: 268).

With regard to basic features (ethics, reality, logic, 'pure language' and aesthetics) in medical translation, Newmark (2004: 8-13) states that where ethics is concerned, a translator must not only translate the text accurately, but also has to ensure the patient is not to be injured or killed due to inaccurate translation. All translators need to be temporary experts in the sense that they must have access to experts who may help to check the medical aspects of the translation. In terms of

reality, this indicates the need for medical translators to perceive what is transpiring. In addition, the text must contain causal, temporal or sequential logic where words like “therefore” and “then” are illustrating what is actually happening. Hence, the medical translation must always be written clearly and concisely, and at the same time must provide the implication of the language to reflect the aesthetic values. That is, any hyperbole or exaggeration should be avoided. Ideally the translated text will be read with the expression and implication in the original text and should also be sensibly written in a smart way. The language of thought suggests that when a word is missing in the source language, an equivalent expression can be found in the target language. Concerning the future of medical translation, Newmark (2004: 8-13) suggests that a major percentage of medical literature in Europe will be solely published in English.

Newmark (1979: 1405-7) further added that the medical language list in European languages is very complicated due to the presence of a large number of synonyms. The complications arise out of the different words used to describe the same condition, subject to whether the point of view is anatomical, clinical, or pathological, often depending on the time and place where the expression is used. For example, ‘*brucellosis*’ has at least 25 similar linguistic synonyms in English and another 6 – 12 similar meanings in other European languages.

With regard to the medical terms, Newmark (2004: 8-13) maintains that in many cases, medical terms originate from Greek and Latin, a reality reflecting the history of medicine. Incidentally, physicians in Ancient Greece or Rome communicated with their community in their native language. Medieval physicians

had used Latin as a means of international communication, and Latin remained the language of medicine well into the 18th century. Eventually Latin was only retained as the standard of the professional by select few.

Medical terminology provides an exemplary illustration of rapid language change. The World Health Organization has estimated that several thousand new terms are created annually. These terms are created in tandem with the vast number of new discoveries in the biomedical sciences, especially in the field of genetics. Theoretical reorientations; especially in the reclassifications and renaming of viruses has also contributed significantly to the list of new terms (Barkman, 1974: 28). Therefore, the medical terminology created should contain meaning which is clear, concise and of reputable standard to enable those related to the medical field to attain effective and precise communication (Gabrieli, 1986: 22).

In regards to a body part, the name certainly of Latin origin while the terms applied to diseases have Greek origin. So it is impossible to find the terms for some disorders due to an organ or body which might be combined with the name of that organ. For example, in English language, we have "kidney" which is an organ whose function includes filtering our blood stream and producing urine anatomically. It should be noted that in the case of referring to anything related to kidney, the word "*renal*" which is Latin, must be used. "*Renal disease*" is given as an example to the case. If a renal disorder is recognized by not a compound word but a single word or term, so "*nephro*" would be used which is Greek. Such as "*nephrolithiasis*" which means a renal disease with stone, or stone in kidney ("*Litho*" means stone). In support of the above mentioned, Albin says that:

> Although there are plenty of exceptions, Latin roots usually refer to a specific part of our anatomy and Greek ones indicate that the part of the body is being studied or that there is something wrong with it. Thus, the anatomical term for the gut is *intestinum* (Latin), and the study of the intestines is enterology (Greek). Let's look at the Latin root for breast *mammo* and its Greek counterpart *masto*. Generally speaking, the Latin root *mammo* will be found in terms which describe either the anatomy (e.g. mammary gland) or a procedure done to a presumably healthy organ (e.g. mammogram), and the Greek root *masto* will be found whenever pathology or malignancy is encountered (e.g. mastectomy).
>
> (Albin, 1999)

The role of Latin and Greek languages in Medical terms of English language has been discussed in brief. With reference to the topic of the study, this study considers medical terms in the Persian language as well. As most medical terms in Persian are Arabic, we must also observe and take into account the influence of the Arabic language in Persian.

1.1 The Persian Language and Arabic Influence on Persian

1.1.1 The Place of Persian among the Families of Languages

According to Baqeri (2005: 12), the Persian language is a member of the Indo-European family of languages, linguistically. The branch of Indo-European that Persian belongs to is known as the Indo-Iranian or Indo-Aryan. It includes both the Indic languages (Sanskrit, Hindi, Marathi, etc.) spoken in northern India today and the Iranian or (also called Aryan) languages. Persian is the most widely spoken of the Iranian languages today. NMELRC[1] (*c.* 2006: 3) is of the opinion that the dialect spoken in Tehran is the most common dialect of Persian. Nevertheless, the standard Dari dialect is being taught in schools and universities in Iran and around the world. Historically, Avestan was the more popular dialect in use as it was the language of

Avesta. It was noted that Avesta was the sacred text of the Zoroastrian religion, which was the dominant religion in Iran prior to the coming of Islam (Baqeri, 2005: 25).

1.1.2 Development of Persian

According to Khanlari (1995: 158) over the past three millennia, the Persian language has developed through three distinct stages of Old, Middle and New. The new Persian language can be considered as having two phases: classical and modern – although both variants are mutually intelligible:

The original Parsa tribe of the Hakhamaneshinian (Achaemenid) era used the Old Persian language; proof of this is evident in the many texts they carved on stone in cuneiform script.

During the Sasanian or Pahlavi era, the middle Persian language was used. Most of the writings from that era were in the form of religious writings of the Zarathushti religion.

The origin of Classical Persian is rather obscure. In short the words come from different languages spoken in various parts of the country where the majority of the words are rooted in Old Persian, Pahlavi and Avesta.

Currently widely spoken, the Modern Persian language or Farsi (Arabic pronunciation of Parsi) is made up of many words of non-Iranian origin. Farsi has integrated English, French and German into some of its technical terms but on the whole has been tainted by Arabic which has replaced many original Persian words.

1.1.3 Emergence of Arabic in Persian

According to NMELRC (*c.* 2006: 2), after the Islamic conquest of Persia in the year 650, Arabic has effected the most significant change in the Persian language. The Arabs spread their language and religion throughout Persia (previous name of Iran). Over the years, the Persian language has borrowed up to half of its vocabulary from Arabic as well as certain grammatical elements. Khanlari (1995: 202) states that after the Muslim Arabs defeated the Persian Sassanid dynasty in the Middle East during the seventh century, many Iranians eagerly converted to Islam. Consequently, the Persian language and culture deteriorated for several hundred years. During this time, Arabic was the language of study for both religious and secular purposes. The Persian language remained a spoken language only and even so was greatly influenced by Arabic. The earlier Persian writing system was forgotten, as was much of the pre-Islamic religion and folklore. Only in the tenth century did a number of Persian poets and intellectuals begin to use the Arabic writing system to write in Persian. During this period, poets like Hafez, Sa'di, and Ferdowsi wrote a large portion of the classical Persian poetry. Although these men were devout Muslims, they attempted to maintain the Persian language and simultaneously revive and preserve certain cultural aspects of pre-Islamic Persian folklore as well as to restrict the deluge of Arabic loanwords into Persian.

According to Khanlari (1995: 241) Persian, since the Middle Ages, has been written in a modified form of the Arabic alphabet in the right-left orientation and during the pre-Islamic times, it was written in the older alphabet form of Pahlavi. Khanlari adds that Persians replaced Pahlavi with the Arabic alphabet approximately 150 years after Persia embraced Islam. Previously, two different sets of alphabets

were used, one for Middle Persian and one for Avestan, which used for religious purposes, and was known as the Avestan alphabet. Khanlari states that the period after the Islamic conquest is described by Iranian scholars as the ’Two Centuries of Silence’. To a certain extent, European words have usually come into use because there was no existing Persian word to describe the situation or product.

The damage to the Persian language due to the distortion by Arabic words which had replaced original Persian words and driven them out of the language, resulting in the reintroduction of original Persian words to sound alien to many readers (Rahnamoon, *c.* 2007). The damage has been so extensive that Arabic words have even found their way into the latter editions of 'Khordeh Avesta', the prayer book of the Zarathushties, which one would expect to be in the Avesta language (Khanlari, 1995: 242).

1.1.4 Nomenclature

According to Khanlari (1995: 276), the name ‘Persian’ or ‘Farsi’ is taken from the province of Fars in southern Iran. This region is the cradle of the Persian language and of the Persian empires of old. Khanlari adds that Achaemenid Persians called their language (Old Persian) Pārsa and the Greeks followed by naming it Persis. From then on, other nations have predominantly named Persia and Persian using words based on the root Pārs. Khanlari mentions that Farsi is the arabicized form of Parsi, due to a lack of the /p/ phoneme in Standard Arabic. Native Persian speakers typically call it "Fārsi" in modern usage. According to the Oxford English Dictionary, the term 'Farsi' seems to have been first used in English in the mid-20th century, but has been condemned by some critics as an affectation of some sort.

According to NMELRC (*c.* 2006), the name Iran is derived from "Aryan," indicating a broader ethnic identity. As a modern country, Iran was first known by Westerners as "Persia", but Reza Shah Pahlavi officially changed it to "Iran" in 1935. Since then, the name Irani or Iranian has come to refer to the civic identity of Iran as a country.

1.1.5 The Islamic Era and Use of Arabic in Science

According to Khanari (1979) the Iranian science was interrupted by the Arab invasion (630 A.D.). Many schools, universities and libraries were destroyed, books were burned and scholars killed. Due to the extent of cultural calamity the Khwarezmians after one generation became illiterate. Nevertheless, the Iranian scientists carried on and the science of Iran (Persia) resurfaced during the Islamic period. In an effort to save their books from the Arabs' carnage, many Pahlavi writings were translated into the Arabic, and Iran produced physicians and scientists the likes of Avicenna, Rhasis and mathematicians such as Al Kharazmi and Khayyam.

Khanlari further adds that Arabic continued to be employed in Iran, though on a decreasing scale, as Latin was used in Europe as a language of the learned. As such it was employed by Abu Ali Sina (Avicenna), Al-Biruni, Rhazes, Al Ghazali and others; indeed, many of the most famous names in Arabic literature are those of men of Persian birth. But in general the use of Arabic declined; while Persian developed rapidly to become the vehicle of a great literature, and before long spread its influence to neighboring lands.

According to Khanlari (1995: 312), the first direct communication between the University of Gondishapour and the Islamic Baghdad, took place during the second Abassid Caliph, Abu Jaafar Mansour (136-154 Hijri, 755-774 A.D). Many Gondishapour physicians exerted important roles particularly in the development of Islamic medicine and pharmaceutical sciences field.

Avicenna known as “Father of Medicine” was a court physician in Persia (Iran), and wrote two of history's greatest works, *The Book of Healing*, a compendium of science and philosophy, and *The Canon of Medicine*, an encyclopedia based on the teachings of Greek physicians (Browne, 2002: 79). Al-Razi (865-925), was another Persian physician whose medical writings were a major influence during the Middle Ages and was one of the most important physicians of medieval times. Razi was a versatile Persian physician, philosopher, and scholar who made fundamental and enduring contributions to the fields of medicine, alchemy, and philosophy. He wrote over 184 books and articles in various fields of science. He was well versed in Greek medical knowledge and added substantially to it from his own observations. He compiled a vast multivolume encyclopedia that included all medical knowledge of the time. The Persian medical terms have been influenced by the Arabic language after the advent of Islam. So its influence on the meanings of most medical terms in Persian may be found, which originated from Arabic words.

1.1.6 Pahlavi Dynasty

In the twentieth century, the kings of the Pahlavi dynasty (1925-79) sought to rid Iran of Arabic influence, including a campaign to replace Arabic loanwords with older Persian ones or new Persian words derived from native roots (Khanlari, 1995).

According to PCGN[2] (2003), Pahlavi did continue in spoken form, but as Arab governors were appointed to rule over Persian states it became inevitable that the Arabic language would be employed as the principal means of administration in Persia. In addition, several linguistic variants in Pahlavi have been revealed with limited effectiveness, especially when their use is discerned by social class and not by geographical location. This awkwardness collapsed against the relative consistency and simplicity of Arabic which, through its use in the Qur'ān, was also attractive (and even deemed essential) as the sacred language of the new Islamic religion. PCGN (2003) claims that it was the constitution identified the Persian language alone as the official language of the country; and in the 1930s an attempt was made to purge the Persian language of its Arab vocabulary. Then in 1935 the Shah changed the country name from 'Persia' to 'Iran', the name it had allegedly borne at the time of the original Aryan settlement.

NMELRC (*c.* 2006) writes that the Iranian identity remains both Persian and Islamic simultaneously as a dual nature. Just because Persian is so heavily influenced by Arabic does not necessarily mean that Persian speakers know Arabic.

1.2 History of Medical Translation

According to Fishbach (1986: 16), both medical and religious translations are the most universal and oldest field of scientific translation because the human body is homogenously ubiquitous. This rather common concept of medical translation often reveals that the translation difficulties in medical area occur fewer than many other types of scientific translation (Fischbach, 1986: 19), since most of medical

vocabulary appears almost universally based on Greek and Latin roots (Pilegaard, 1997: 160).

Pilegaard (1997) states from the 15th century onwards, many Greek writings were translated into English but the gradual development of English as the international language of medicine only started some 500 years ago. Besides, English medical translators of 15th and 16th centuries were fundamentally facing the dual challenge of translating from classical languages or contemporary vernaculars into English, and accepting the use of borrowed or exotic terms from non-classical languages. Still, at that time, progress in the medical sciences was comparatively slow and the translator's task was simplified by the fact that the basic anatomical and physiological elements of medical communication were largely the same all over the world. The equality of the concepts of various fields leads the medical translator to walk on the edge over his colleagues in other fields (Fishbach, 1986: 19), so medical translation was a comparatively easy task. As a result, "English has today replaced Latin as the language of international medical communication" (Pilegaard, 1997: 161).

1.3 Medical Terminology

Medical science is progressing every day and therefore plenty of medical words are emerging alongside upcoming technology. This is also true when we observe the new areas in medical science which involve special words and terms. When first confronted with the medical terms, an average person is often bewildered by the strange spelling and pronunciation.

According to Mareckovaa, Simon, and Cerveny (2002: 581), the history of medical terminology shows that it was in France that Latin first started retreating from medicine, followed by Italy and later England. They suggest that although Latin was abolished as a teaching and scientific language, its nominating purpose and permanent position in the key component of the language of medicine terminology had been preserved and retained. Despite the fact that the use of Latin as the medical terminology in the 20th century is diminishing, professional communicative acts in the national languages have so far been realized with the use of international Latin-Greek terms. This state follows from the generally known advantages; that of terminological continuity and space (it is a worldwide, universal terminology, not bound to any nation), to that of history (terms have been used in a more or less unchanged form for over 2000 years). Apart from this, Latin and Greek constitute a unique stock which may also be drawn upon in the case of the need of creating a new term. In this regard, Mareckovaa and his colleagues claim that:

> Furthermore, it should be noted that in the last century there appeared a new phenomenon which was menacing the special terminological function of Latin in modern medicine – the English language. There exist contradictory views of its status and perspectives. These range from H. Lippert's (1987: 86-101) assertion according to which English has taken over the role of Latin in medicine, to the opinion of the well-known German historian of medicine H. Schipperges (1988: 59, 63, 153), who states that Latin with Greek "have masterfully outlived" not only the Arab influence in the Middle Ages, but also the fierce onset of English in the 20th century. English medical terminology is predominantly Latin or Latinate.
>
> (Mareckovaa, Simon, and Cerveny, 2002: 582)

Shan (2005: 22-30) mentions many standard medical terminologies as well as well-accepted morpho-syntactic structures in a medical text and thus calls it a known "standardized text". When translating, the translator should standardize those subject-

specific words or terms to achieve a successful communication. However for the language units other than subject-specific ones, the translator should respect the genius of each language. It should be noted that while "an important point of scientific translation is that, of all the components of the language, technical terminology has the highest probability of one-tone equivalence"(Wilss, 2001: 131), in the regard of equivalence at word level in medical translation, caution must be exercised especially in case of cultural concepts or where the SL is not lexicalized in the TL.

It is also true that people in different parts of the world use different images in describing the same sense or meaning that they share, which is not seldom seen in medical context. Shan explains that for example, the translator should seek out the equivalent Chinese language for medical words like "pigeon chest" as“鸡胸” [*ji xiong*] (Chicken chest) rather than“鸽胸” [*ge xiong*] (Pigeon chest)，"goose gait" as “鸭步” [*ya bu*] (duck gait) instead of “鹅步” [*e bu*] (goose gait)，"dumb-bell tumor" as 葫芦状瘤” [*hu lu zhuang liu*] (bottle tumor) compared with“哑铃状瘤” [*ya lin zhuang liu*] (dumb-bell tumor)，because they fit into the Chinese people thinking and imaging patterns.

Pilegaard (1997: 169) writes that the principles for producing medical texts are highly genre-specific and "each genre has characteristic features of style and form that are recognized by those who use the genre". In other words the different genre must meet "conventions about layout, form and style that are to a large degree standardized".

Kussmaul (1997: 67) believes that ‘convention’ means compliance and anticipation, in which people are expected to use the words in the same sense as others who use them. Shan (2005: 22-30) clarifies this with an example of a late phrase in surgery, "minimally invasive surgery". He suggests that this phrase has already had a unified Chinese equivalent as“微创手术” [*wei chuang shou shu*] (very minute concentrate surgery). He claims that Chinese translators who are not familiar with the English version of this phrase may propose various kinds of similar interpretations, as the author found while editing medical abstracts, such as "minor-injury surgery’ , or "no-wound surgery". According to Shan (2005), these interpretations may not be regarded as wrong because "minimally invasive surgery" has replaceable linguistic features and the most important aspect is that "minimally invasive surgery" as a whole expresses a fixed notion in surgery and serves as a symbol for it, which means "surgery done with only a small incision or no incision at all, such as through a cannula (套管) [*tao guan*] with a laparoscope (腹腔镜) [*fu giang jing*] or endoscope (内窥镜) [*nei kui jing*]”. This English version has become well accepted in medical field internationally; therefore it is conventional and standardized.

Shan (2005) insists on cautious translation when it comes to finding the equivalents at the word level when there is no equivalent in the TL or with culture specific concepts. When the translator tries to achieve a successful communication, then this area of caution translation is significant. For example, a SL word with the category of the noun in the parts of speech might be translated into a noun phrase in the TL, like English into Persian. It is due to the lack of the relevant SL grammatical

structure in TL (Persian language) as compared to the SL language (English). For example the word ‘condense’:

condense ⟶ *taqliz kardan (تغلیظ کردن)*

English Persian

“Condense” in English is a single word, but during translation, has been transformed into a phrase in Persian which was borrowed from Arabic. Kafi (1984) states that the problem of translating derivations of such words in the Persian language will be improved, if we find appropriate Persian equivalents for them.

“Condensed, condenser, condensing, condensation” and “to condensate” are other derivations of “condense” which could be considered for this word, but actually the phrase of “*taqliz kardan*” is not the exact meaning word for ‘condense’. Kafi (1984) adds that if we find a Persian equivalent (like *čegālidan (چگالیدن)* for this English word which is a common term in Physics, then every derivation could be translated easily. Newmark (1988: 85) mentions that it is likely that comparative linguistics researchs and analysis of text corpuses and their translations will further uncover a significant number of serviceable shifts for us.

1.4 Statement of the Problem

Medicine is a field of knowledge in accelerated scientific and technological development that each year incorporates a large number of new terms into the medical lexicon. Alfaro (2005) states that health professionals learn directly in the original language of the publication and stick to it in daily usage, including

congresses and articles written in the target language because of the need to quickly update knowledge.

According to Lee-Jahnke (2005), translators fall into two categories of people: those with a medical background (medical students and physicians), and good translators genuinely interested in the medical field. Both of them have their advantages and drawbacks. The persons in the first category comprehend the subject matter while they lack knowledge of Translation Procedures (TPs). The second group must obtain the specialized and technical knowledge and therefore need more feedback from the medical community. Lee-Jahnke (2005: 81) believes that a good translator is namely the one that can produce a better translation after mastering the techniques of translation. Alfaro (2005) with his knowledge as a Portuguese translator explains the problems of medical translation in his native language as follows:

> …. For a lot of words, it is not easy to find suitable corresponding terms in Portuguese, thus making translation difficult. This process is often carried out by medical students who have no translating experience and little knowledge of the source language, or especially of the target language. They can also be carried out by professional translators who are not familiar with the associated vocabulary or medical practice, resulting in seriously distorted meanings.
>
> (Alfaro, 2005)

Alfaro (2005) states that inexperienced and amateur translators do not perform deep and precise research into terms that have already been translated in medical literature, thus causes highly heterogeneous translations from one publication to another. He adds that ultimately, medical translation is a poorly paid field, which is inevitably reflected in the quality and all these problems can explain

the doctors' resistance to the employment of the translated terms and their mutual consent and definitive incorporation into the profession's terminology.

According to Alfaro (2005), amateur and inexperienced translators must ask from translation professionals to avoid the classic pitfalls or problems linguistically and to have the text thoroughly perfect. Furthermore, professional translators who have no medical knowledge need to establish an extensive network of contacts with health professionals, so they may ask questions and discuss the meanings. Since the field of medical knowledge is so wide, no one is familiar with the entire lexicon, therefore it is imperative for the translator with a medical background to build up the contacts with health professionals.

Lee-Jahnke (2005: 82) explains that terminology is one of the difficulties that can be faced in medical translation. In many cases medical terms originate from Greek and Latin, a fact which reflects the history of medicine. He emphasizes that steps need to be taken to familiarize translators with Greek and Latin terms as these will help them to translate. This is due to the fact that some of these translators do not learn these two languages.

There has been a rapid increase in medical terms in this age of technology and communication. Therefore, it is not possible for scholars to study all of the terms comprehensively during this limited time. Pilegaard explains the problem as follows:

> Owing to the rapid progress in medicine, the need for exchange of information is great… It may indeed be claimed that medical translators may run in the problem that there is no such thing as a systematized knowledge of the syntactic, semantic and pragmatic limitations of medical terminology, because specialized registers in

> general, and medical terminology in particular, undergo constant innovation, adaptation and change.
>
> (Pilegaard, 1997: 162)

He adds that due to the vast quantity of Latin and Greek loan words, the non-native speakers may encounter with some special problems in the lexicon of English language, which are, especially in the case of post-renaissance borrowings, not thoroughly incorporated into the fabric of the language. Pilegaard (1997: 168) suggests a number of conclusions, after reviewing some essential studies of translation from major world languages into English, as follows:

1. There are only a few studies found to have used or evaluated medical research papers from a translational perspective.
2. There are translation problems found at all levels of the translation process.
3. There is an apparent shortage of translation theories and translation practical tools for translators in the field of medicine.

On the other hand, apart from some bilingual medical dictionaries between major world languages with a lot of rudimentary microstructures, there are very few technical lexigrographic tools available to a medical translator to solve the problem of culture bound translation at the lexical level (Pilegaard, 1997: 165).

Thus, since medical translation is based on specific cognitive knowledge which is mainly concerned with information, special care is needed when two or more fields overlap. With this view in mind, Jammal (1990: 50-54) mentions that it is difficult for the translator to understand the text for terms with different meanings. So

it is a subject of various studies which may not be easily outlined although it would be an interesting point of research for translation studies.

The Persian language faces such problems in translating the medical terms as well. Kafi (1984) mentions that it needs to take a scientific approach in order to solve the problem of word choice. He explains that due to unfamiliarity with this problem and the lack of understanding the urgent needs of special Persian lexicon for several scientific areas, most Persian linguists failed to find a suitable solution. The current Persian Language is not an active language for conveying scientific purposes and shows its inability to fulfill this task.

The major reason for this inability, according to Kafi (1984), can be attributed to the lack of appropriate scientific Persian equivalent. However, he believes that the Persian language possesses a high potentiality for generating scientific lexicon. He explains that the Persian language contains two fantastic capabilities simultaneously which can rarely be found in any other language - Combinational and Derivational potentiality. Combinational is an active potentiality in the present Persian language. Most of the new words that have been made are based on this potentiality, for example like *''?āb bahā* آب بها "(water bill), and "*gozarnāme*، گذرنامه " (passport), while the derivational potentiality has been degenerated or degraded due to interference of some foreign language lexicon and it has lead the Persian language to lose this capability in most translated cases. What the current Persian language need is to revive this potentiality again. For derivational potentiality, consider the infinitive "to conduct". English derivatives are "conductance, conductibility, conducting, conduction, conductive, conductivity and conductor" and the Persian

language must find an equivalent with capability of derivatives to clarify the semantic relations between the English words and its Persian equivalents.

Opposition for derivational potentiality in the Persian language is due to lack of knowledge of these problems according to Kafi (1984). Opponents think that scientific and technical lexicon are limited only to some tool nouns or object nouns such as aeroplane, telephone, television and telegraph. This can be attributed to the fact that they are involved only with this aspect of science and technology and nothing else!

And finally Yarmohammadi (1993: 50) presents his recommendations in the scientific translation area indicating a great problem for scientific and technical terms and their Persian equivalents. He calls on Persian linguists and translators to sever attempts in translating and writing technical and scientific texts, resources and references. He then recommends them to devise encyclopedias so that Persian, as a national language, can increasingly find its position in rendering and justifying scientific materials. Thus, according to him, primary resources of this technical information could be found in the national language (Persian), rather than in foreign languages.

Since there is no clear description of medical terms, this study will be done based on word formation processes (WFPs) and TPs to help the translators find appropriate equivalents for medical terms in the future by referring to the discussions above.

1.5 Objectives of the Study

The objectives of this study are:

1. To determine the similarities and differences of selected medical terms based on WFPs.
2. To investigate the procedures applied in the translation process of the selected medical terms from English into Persian language.

1.6 Research Questions

1. What are the similarities and differences between the selected English and Persian language medical terms with respect to WFPs?
2. What are the procedures applied in the translation process of the selected medical terms from English into the Persian language?

1.7 Significance of the Study

Since medical translation is one of the important tools for communication between patient and physician and other health care professionals, a small mistake or error in translation of medical records or messages might lead to damages or injuries which may not be compensated. The significance of a correct and proper translation appears especially in the events of natural crises, war and emergency disasters, the events in which there is no time for finding the equivalents of the medical terms where a medical translator acts as a medical professional. The translator is obliged to provide a clear and accurate translation of medical documents, terms and records. So if the characteristics of the medical terms and their appropriate equivalents are

recognized and understood, the translation process will be easily done with a high degree of accuracy, confidence, and speed as well.

1.8 Scope and Limitation of the Study

The medical terms will be selected based on ICD-9-CM[3]. This book presents all of the medical terms based on the 22 systems of the human body as classified by WHO (World Health Organization). 'Musculoskeletal system and connective tissues' is one of the systems in this book which has been selected as the sample area of the study. The process of the study will be organized and systematized based on human body classification in this resource and in this study.

Therefore, considering what has been mentioned above, the limitation of the study includes as follows:

1. Since the time is not enough to perform this study on all the medical terms in medical sciences with its broad branches such as medicine, genetics, anatomy, pathology, laboratory, radiology and etc, thus only the medicine field has been selected for this study (due to time constraint).

2. It is impossible to consider all the medical terms due to all the systems of the body in this study. Therefore only "musculoskeletal system and connective tissue" has been selected for this study (Appendix I and II) from the classification of diseases based on the 22 systems of the human body as applied by WHO. In this system, we may find all kinds of terms due to the related disorders, from the simple to more complicated terms. The limitation of time for the performance of this study is an important

factor to narrow this study to a certain system among all the human body systems.

3. Linguistically, the study and the implementation is limited to certain grammatical aspects of the theoretical linguistics mainly morphology and syntax and with some semantics. Although phonetics and phonology are not mentioned in this study, they can be discussed generally in any further studies or explanations.

1.9 Theoretical Framework

The data of the medical terms in this research is studied with respect to WFP based on Katamba (1993) and Yule (1985) (cf. figure 1.1). Yule (1985: 51-59) classifies the WFPs as follows:

'Coinage' is the invention of totally new terms such as "*Kleenex*" and "*Xerox*" which have quickly become everyday used words in the language.

'Borrowing', that is the taking over of words from other languages such as "*robot*" (Czech) or "*piano*" (Italian). A special type of borrowing is Loan-Translation or Calque, in which there is a direct translation of the elements of a word into the borrowing language. Like "superman" which is a loan translation of the German "*Ubermensch*".

'Compounding' is a joining of two separate words (normally nouns) to produce a single form, such as "textbook" and "bookcase".