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## **METAPHOR IN SCIENTIFIC LANGUAGE: A STUDY ON MEDICAL TEXTS**

### **ABSTRACT**

*The object of this paper is to analyse the metaphors in specialised medical language in Spanish, in terms of the theory of metaphor developed by authors such as Lakoff and Johnson. Metaphors have been previously studied in non-specialized medical texts or in patients' explanations of their symptoms. This study focuses on written specialized medical texts aimed at doctors and students of medicine and it also revises some denominations for illnesses. Through these data it will be shown how medical language makes use of metaphorical systems. In a traditional view of metaphor, which associated it with subjectivity, scientific texts like those under analysis were not expected to contain metaphors. But the explanatory and descriptive power of metaphor makes its use relevant in these manuals whose main aim is to classify and explain concepts without room for misinterpretations.*

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## 1. INTRODUCTION AND THEORETICAL FRAMEWORK

Metaphor is one of the key research areas in cognitive linguistics and its analysis has given rise to a wide range of studies. The present paper takes as a departure point the theory of metaphor developed by authors such as Lakoff and Johnson (1986, 1999) to apply it to the study of medical language in order to test if metaphors are present in that kind of discourse and, if this is the case, what type of metaphors can be observed. It will be based on the following definitions of metaphor and metonymy proposed by Barcelona:

the cognitive mechanism whereby one experiential domain is partially 'mapped' i.e. projected, onto a different experiential domain, so that the second domain is partially understood in terms of the first one. The domain that is mapped is called the *source* or *donor* domain, and the domain onto which the source is mapped is called the *target* or *recipient* domain. (Barcelona 2000:3)

Metonymy is a conceptual projection whereby one experiential domain (the target) is partially understood in terms of another experiential domain (the source) included *in the same common experiential domain*. (Barcelona 2000-4)

Before entering the practical analysis, let us briefly examine those aspects of metaphor theory that are relevant for the purposes of this paper; while doing this, it is important to bear in mind that all the subsequent characterization of metaphor could be applied to the metaphors studied in this paper. To start with, one of the first remarkable aspects of metaphors is their coherence and systematicity: Lakoff and Johnson argue that most of our concepts are organized in terms of metaphors that are coherent and systematic in themselves and compared with others (e.g. HAPPY IS UP, GOOD IS UP, WEALTH IS UP, etc.). These metaphors originate in our cultural and physical experience (embodiment; see Lakoff and Johnson 1986:55-56). Thus, the primary function of metaphor is to provide a means of understanding one experience in terms of another, through previous or newly created similarities (1986:195-196). Metonymies are systematic in the same way (1986:77-78). These authors also argue that many of our activities share a metaphorical nature, as solving problems or calculating time, and that metaphors have the

capacity of creating a new reality, structuring our conceptual system and the tasks we carry out. Metaphors are able to change what is real for us and affect the way we conceive the world (1986:187).

The traditional view of metaphor linked it with literary language and subjectivity; therefore, scientific language seemed to be bound to free itself from the burden of metaphor to achieve objective communication. In Reeve's words (2003): "Seventeenth century natural philosophers sought a language for the new science that would be transparent to meaning, a language free of the obfuscations of metaphor, analogy, and other devices of Renaissance magical and religious rhetoric". However, with the new vision of metaphor postulated by cognitive theory, metaphors become an instrument bearing a crucial explanatory potential:

In the last four decades, metaphors have been transformed from the "victimizers of scientists" to "cognitive instruments" and inescapable elements of the ways scientists and the rest of us conceive and construct the world. More recently, the developing cognitive science area of cognitive theory of metaphor has been arguing, with increasing empirical evidence, that metaphorical thinking is an unavoidable filter of our thought, including and especially in science and philosophy of science. (Reeves 2003)

The cognitive study of metaphor has the advantage of systematising the use of metaphors in a great variety of genres in written and spoken language (Carretero 2000; cf. 50-56 for a comparison between a cognitive and a pragmatic approach to metaphor). From a cognitive point of view, the study of metaphor began in non-specialized language, then broadening its scope to such diverse areas as economy (White 1997, Herrera and White 2000), biology (Keller 1995) or even visual metaphor (Forceville 1998). With regard to medical language, metaphors can be considered from two points of view:

- a) non-specialised description of pain or illnesses in the doctor-patient relationship;
- b) specialised description of illnesses or healing techniques catering for professionals.

Concerning the first research area, metaphor has been studied in the doctor-patient relationship (Goldbloom 2003) and in patients explaining their symptoms (Tompkins and Lawly 2003; Teucher 2003) or describing the effects of different illnesses (Sontag 1978, 1989; Goldbloom 2003). Firstly, the expressive force of metaphor and its creative power can be found in the doctor-patient relationship: language affects this relationship, shaping it according to the source domain from which it is explained. It can even be conceptualised as a relation between a customer and a provider of services (Goldbloom 2003):

In psychiatry, wherein developments in psychopharmacology and validated psychotherapeutic techniques have allowed us to broaden our repertoire of ways to help our patients, the changes in language (let alone metaphor) are extraordinary. Our patients are often deemed clients, not because of any solid evidence that this is what they prefer to be called, and despite some evidence to the contrary. Rather, the world is intended to reflect collegiality toward nonphysician mental health professionals and the evolving relationship between health care providers and people who use their services.[...] The term "consumer-survivor", readily adopted by governments and agencies in some official documents, blends true belief that health care is a commodity to be purchased as dispassionately as groceries with a more malignant idea- the idea that people have survived abusive psychiatric treatment rather than the illness itself. This use of the term "survivor", with its awful echoes of its use for people who survived the Holocaust and other tragedies, bears no resemblance to people who designate themselves breast cancer survivors.

Secondly, metaphor seems to be also a natural element in the description of illness. Tompkins and Lawly (2003) point out as metaphors commonly used by doctors THE BODY IS A MACHINE, ILLNESS IS A PUZZLE TO SOLVE, THE DOCTOR IS A CONTROLLER. Metaphors used by patients are "more vivid, expressive, and idiosyncratic ("It's "like Satan's got into her", "I'm the cotton wool man", It's "like a Chinese burn, it just gets tighter and tighter", It's "as though my body has been pummelled""). In the 19<sup>th</sup> and 20<sup>th</sup> centuries medicine has used military metaphors in its fight against illness (Goldbloom 2003), "to promote the idea that illness is an enemy to be defeated and to enjoin the public in common cause". As an instantiation of this metaphor, Goldbloom introduced SARS (*severe acute respiratory syndrome*) in Ontario and Irak (an outbreak of this illness appeared in Canada at the moment of Goldbloom's writing). This illness was presented through a war-like language, using terms such as strategy, defeat, logistics,

etc.:

There is a command post for the province of Ontario, juggling the advice of its Scientific Council and the need for restricted access to the health-care sector with the reality that people who are ill from causes other than SARS will suffer from our own collateral damage - inadvertent suffering resulting from the dogged pursuit of a major threat to our health. Journalists and the general public are briefed daily on the progress against this threat.

Illness is thus conceptualised as a fight in the metaphor ILLNESS IS WAR, in which the treatment is the weapon to kill the enemy (for instance, the virus) and save the patient (Zajicek 2004). Sontag explains the tendency to describe illness through metaphors with the examples of tuberculosis and cancer (1978) and AIDS (1989). Sontag claims that AIDS blends two powerful metaphors. The first one is ILLNESS IS AN INVADER: the enemy invades and destroys from inside. In keeping with the war schema, military metaphors are developed, as it has already been discussed. The second metaphor, ILLNESS IS A PLAGUE, is due to the fact that it is a sexually-transmitted metaphor.

The motivations for the use of metaphors in these descriptions are of varied nature, but it can be stressed out that in general their use covers a breach of communication. If we bear in mind that illness is a traumatic experience, it is easy to understand that it may be difficult for patients or relatives to talk about it; for example, in serious illnesses, it is difficult to speak about the spread of the illness and the possibility of dying, which sometimes may make the illness a taboo. An evidence for this is provided by cancer: the seriousness of the illness may lead to the use of a more indirect or metaphorical use of the language:

Similarly, many relatives and friends do not know how to speak to the ill person, while health professionals often resort to factual, medical language. Obviously, cancer is an experience that is enormously difficult to put into language: how should the lived experience of suffering, uncertainty, and the fear of dying be stated? Metaphors help to address these difficulties and indeed, illness discourse abounds with metaphors. (Teucher 2003)

The second point of view previously presented was illness description in specialized medical texts. This will be the scope of the present paper. Studies such as those by Brown (2003)

or Boquera (2000) are revealed of interest within this area. The latter is devoted to the translation of metaphor from German to Spanish and English, concluding that the three languages share the same conceptual system with respect to the health field; consequently, metaphor transfer between languages is possible. This fact is also corroborated in this paper: the same types of metaphors were pinpointed in all the texts analysed, including original and translated works.

## 2. HYPOTHESIS

As formerly stated, this paper will examine metaphor in medical language in Spanish within the framework of the theory of metaphor previously sketched. Through the analysis of written texts it will be shown how medical language configures metaphoric networks. The departure point will be the following hypothesis:

a) First, if our language is basically metaphoric, as outlined in the theoretical framework, scientific language should also be tantamount to any other sort of language types and show instances of metaphors.

b) Secondly, metaphor was traditionally associated with subjectivity or literary language, hence regarded as far away from scientific language. But the explanatory and descriptive capacity of metaphor may make its use relevant in medical manuals, whose main aim is the clarification and description of specialized terms.

## 3. METHODOLOGY

The study is divided in two parts:

a) The first part is devoted to the analysis of specialised medical texts catering for doctors and medical students. The texts chosen are: Noguer and Balcells (1997), Waldman (2003) and Lience (1982). These three books offer a rather wide variety within medical language. Noguer and Balcells seek to present basic practical lines for the patients' exploration; Waldman centres on pain treatment and diagnosis of common disorders. These two works have been selected because they present a general perspective valid for all specialities; moreover, the first was originally written in Spanish and the second is a translation from English. Lience's book, however, is restricted to a specific area, rheumatology. As it will be revealed in the subsequent analysis, these differences (different study area and translations vs. original) do not trigger the use of different metaphors, since the metaphors listed in the sections below are witnessed in all the three works.

b) The second part of the paper presents a brief list of medical terms and names of illnesses and injuries that stem from metaphoric mechanisms. These provide further examples from the metaphorical devices presented in the first part of the paper.

## 4. ANALYSIS

### *4.1. Medical texts*

After reviewing the medical works mentioned above, metaphors were found to be pervasive in medical language. The most relevant areas where metaphor is present are four: (a) illness description, (b) patient's exploration, (c) pain description and (d) anatomy. It is remarkable that in some cases metaphoric terms appear within inverted commas (this is especially common in Noguer and Balcells'). This is probably due to the fact that they are felt to

be less commonly used than other metaphors.

Let us now pass on to the review of some examples of the metaphors selected. Extracts from the texts are included with metaphoric terms signalled in bold for clarification.

#### 4.1.1. Illness description

The first metaphor found within this area is ILLNESS IS A HISTORICAL EVENT. The source dominion in this case is history: illness is characterized as a historical event, showing an age, a development, etc.

(1) Se llama "**historia** clínica" al relato, escrito o verbal, de la enfermedad de un paciente. (Noguer and Balcells 1997:1)

(2) Una vez fijada la real "**edad** de la enfermedad" [...] y conocida la fenomenología subjetiva y objetiva que marcó la transición del estado de perfecta salud al inicio de la enfermedad [...] (Noguer and Balcells 1997:4)

(3) La "**antigüedad**" del dolor suele confundirse con la "edad de la enfermedad", pero no es de obligada coincidencia. (Noguer and Balcells 1997:8)

As a historical event, it evolves in time:

(4) Luego conviene aclarar la distribución del dolor en el año, es decir, el **calendario** del dolor. (Noguer and Balcells 1997:10)

(5) Es interesante registrar también el **ritmo evolutivo**, *de progresión* o *de regresión lesional*. (Noguer and Balcells 1997:10)

(6) En otros casos el **ritmo** doloroso es *estacionario*, sin aceleración ni mejoría con el paso del tiempo. (Noguer and Balcells 1997:10)

If an illness has a history, doctors can be historians:

(7) La historia clínica, si merece este nombre, debe reflejar el flujo o la secuencia en el tiempo de los distintos hechos, según el orden sucesivo en que aparecieron y evolucionaron en la conciencia del enfermo y los sentidos de las circunstancias. La actitud del **médico historiador**, a manera de notario o cronista, debe ser expectante e imparcial, atento a registrar, con la máxima fidelidad, todo lo ocurrido, sin influir al enfermo con "preguntas-prejuicio" o inclinándole, con la forma afirmativa o negativa al preguntar, hacia una corroboración coactiva de lo que el médico acaba de pensar. (Noguer and Balcells 1997:4-5)

The next metaphor, very frequently used, is ILLNESS IS A WAR. As reviewed in the



theoretical framework, some authors have already identified this metaphor, where illness treatment is conceptualised as parallel to a war. It is remarkable that this metaphor is reversible, as it has operated two ways: now it is common to speak about “guerra preventiva” (“preventive war”). Some examples are the following:

(8) La **prevención** constituye, pues, el ideal a conseguir a través de los estudios epidemiológicos, permitiendo relacionar lo más estrechamente posible la incidencia, etiopatogenia, evolución y **factores de riesgo** de las distintas enfermedades, con la perspectiva de elaborar una **política de prevención**, información y educación adecuadas para cada una de las diferentes situaciones. (Lience 1982:1)

(9) La prevención primaria es sinónimo de profilaxis. Comprende el estudio de la susceptibilidad (diátesis) del organismo humano y de los factores ambientales en el desarrollo de una enfermedad y la forma de influir eficazmente en la **prevención** de la misma, caso de la prevención de la fiebre reumática a través de la **lucha** contra las infecciones estreptocócicas. (Lience 1982:1)

(10) En la prevención terciaria se trata de disminuir el dolor, prevenir las **complicaciones**, la progresión y la **exacerbación** del proceso patológico. (Lience 1982:1)

(11) [...] la XXIX Asamblea Mundial de la Salud (1976) había indicado que la **prevención** de las enfermedades reumáticas y la **lucha** contra estas afecciones debían ser parte integrante de los programas nacionales de salud. (Lience 1982:6)

(12) [...] teniendo cuidado de evitar los **efectos colaterales** sobre el sistema nervioso central (Waldman 2003:6)

Proceeding within this metaphor, illnesses are enemies that attack and invade the body:

(13) **ataques** de cefalea (Waldman 2003:16)

(14) El dolor tiene carácter neurítico y puede ser profundo y penetrante cuando se debe a la **invasión** tumoral del plexo. (Waldman 2003:59)

Let us provide some insight into this reversible capability by showing some texts

about the war in Irak, where medical terms appear in a real war context:

(15) A estos 23 conflictos hay que sumar 52 situaciones de tensión en las que el elemento común más destacable es el **riesgo** (en mayor o menor medida) de **estallido** de conflicto armado como consecuencia de una escalada en la violencia armada. (Mateos Martín et al: 2004)

(16) El informe Alerta 2004! pretende ser una herramienta de alerta **preventiva** mediante el análisis de las tendencias que a escala mundial se vienen produciendo en los últimos años y de la interrelación que existe entre todos los ámbitos señalados. El reto debería ser una apuesta decidida por las diplomacias **preventivas** y de paz, que nos permita abandonar la tendencia regresiva de los últimos años de militarización, deterioro de los derechos humanos, espiral de la violencia y

preponderancia del unilateralismo, y no permitir que la guerra **preventiva** se convierta en una herramienta institucionalizada y legitimada por la comunidad internacional para la resolución de conflictos. Una **prevención** adecuada permitirá que no nos acostumbremos a llegar siempre tarde, cuando la imposición, más que la construcción de la paz, aparece como la única alternativa. (Mateos Martín et al: 2004)

(17) Lejos de consolidar el "nuevo orden" mundial, la guerra contra Irak sólo traerá como consecuencia la **exacerbación** de tales rivalidades. (Socialistworld.net 2003)

(18) La posición del gobierno turco está indudablemente influenciada por un 95% de oposición popular a la guerra y también por el deseo de la clase gobernante turca de enviar a sus propias fuerzas al norte de Irak para **prevenir** la consolidación de un estado Curdo autónomo. El rechazo a permitir una ruta a través de Turquía para abrir un frente en el norte contra Saddam sería una enorme **complicación** para los planes de invasión de EEUU. (Socialistworld.net 2003)

#### 4.1.2. Patient's exploration

In describing how doctors explore their patients the following metaphor comes out: DOCTORS ARE RESEARCHERS / DETECTIVES / EXPLORERS. This metaphor entails several others: SURGERY IS AN INTERROGATION, ILLNESS IS A CRIMINAL (with a criminal record, for instance). Doctors' tasks are considered as those of an EXPLORER in many cases (hence the term "exploración clínica"). Some examples are the following:

(19) Pasamos después a **interrogar** al enfermo sobre sus antecedentes patológicos, esto es sobre otras enfermedades, distintas a la actual, que pueda haber padecido anteriormente. (Noguer and Balcells 1997:3)

(20) [...] para así poder "dirigir", cuando sea necesario, el **interrogatorio** hacia los hechos fundamentales. (Lience 1982:11)

(21) Pero suele ampliarse [la historia clínica] a los remotos "**antecedentes**" incluso de la estirpe del enfermo, y abarca todos los aspectos humanos de la existencia y no sólo la enfermedad concreta, actual, de aquella persona. (Noguer and Balcells 1997:1)

(22) La demostración de los antígenos de histo-compatibilidad (HLA), marcadores genéticos, ha significado la confirmación de esas **sospechas** iniciales [...] (Lience 1982:2)

(23) La **inspección** progresará "en profundidad" después de reconocer las manifestaciones cutáneas. (Noguer and Balcells 1997:44)

(24) La **inspección** se realiza con el enfermo sentado. (Lience 1982:12)

(25) **exploración** clínica (Noguer and Balcells 1997:41); **explorar** el cuerpo del paciente (Noguer and Balcells 1997:42); la **superficie** del cuerpo o de la **región** determinada que se va a

**explorar** (Noguer and Balcells 1997:43)

(26) [...] o un caso de mala **exploración** o equivocada interpretación de un **hallazgo**. (Noguer and Balcells 1997:200)

(27) No obstante, cualquier información obtenida mediante estas técnicas sofisticadas de imagen sólo es un **hallazgo de presunción** para orientar al médico. (Waldman 2003:45)

(28) Es un error grave y generalizado valorar unas radiografías o unos análisis sin haber **interrogado** y **explorado** adecuadamente al enfermo. (Lience 1982:10)

(29) Aunque no existe una prueba específica para la DSR, es posible un diagnóstico de **presunción** cuando el dolor se alivia de forma significativa tras bloquear el ganglio estrellado con anestésico local. Hay que subrayar que debido a la naturaleza diversa de la lesión tisular que causa la DSR de la cara, el clínico debe **investigar** con frecuencia la patología oculta que puede simular o coexistir con la misma [...] Todos los pacientes en los que **se sospecha** DSR de la cara deben ser sometidos a resonancia magnética del encéfalo, y si existen síntomas occipitales o nucales significativos, la columna cervical. Las pruebas de laboratorio consisten en hemograma completo, velocidad de sedimentación globular y bioquímica estándar para descartar una infección y otras causas inflamatorias de lesión tisular que puedan dar lugar a la DSR. (Waldman 2003:39)

(30) La clave para reconocer la DSR de la cara es el elevado índice de **sospecha** clínica. Se debe **sospechar** DSR en cualquier paciente con un **antecedente** traumático o dolor de tipo urente o con alodinia. (Waldman 2003:41)

As before, some extracts from legal texts illustrate the similarity of the terms used in medical and police / legal language:

(31) Confidencias recibidas por el Grupo de Investigación Fiscal y Antidroga de la Guardia Civil de Málaga sobre la vinculación de Abdelaziz Mohamed Haddou, mayor de edad, sin **antecedentes** penales [...] (B.O.E. 1999)

(32) Los Agentes actuantes, luego de **averiguar** que el teléfono citado correspondía a una empresa denominada Artell S.A. [...] (B.O.E. 1999)

(33) Mohamed Abdel-Lah fue detenido en Fuengirola, como **presunto** implicado en un alijo de drogas. (B.O.E. 1999)

(34) Con razonamientos sustancialmente idénticos a los contenidos en el recurso núm. 195/95, se alega haber padecido vulneración del derecho a la **presunción** de inocencia. (B.O.E. 1999)

(35) [...] todo ello para concluir que se ha producido una absoluta invalidez de las **pruebas** aportadas al proceso [...] (B.O.E. 1999)

(36) Había que dirigirse rápidamente al edificio de Ahumada 312, lugar donde, según la **investigación** realizada hasta el momento, se podrían encontrar **pruebas** concluyentes y, con suerte, el resto de los integrantes de la banda. (Rivera 2000)

(37) [...] los indicios dejados por la banda dirigida por Palma hicieron **sospechar** que se trataba de una organización que operaba masivamente. (Rivera 2000)

### 4.1.3. Pain description

Pain is very often described in terms of another domain, as in the metaphor PAIN IS A SOUND. As such, pain is described as, for instance, *sordo* (*muffled*) or *agudo* (*high-pitched*):

(38) Aparte de que los dolores muy intensos depongan en favor de la organicidad del cuadro, la distinción entre el carácter **agudo** o **sordo**- dolorimiento más que dolor- de la molestia que sufre el enfermo permite ya una cierta argumentación diagnóstica. (Noguer and Balcells 1997:11)

(39) El dolor es de tipo urente o **sordo profundo**. (Waldman 2003:16)

Another common parallel is PAIN IS A WEAPON. This is a metonymy that describes pain through the weapon that might have caused it. It is associated with the war metaphor aforementioned, in which illness is seen as a fight or a war. Nogher and Balcells (1997:12,16)

mention the following adjectives related to pain:

(40)		
pungitivo o punzante (en "puñalada")	puñal	
terebrante	taladro	
gravativo		peso
pulsátil (martilleo)		martillo
punzante o cortante	puñal	
pinchazos		pincho
opresión	losa	

Other related metaphors are the following:

(41) [...] la existencia de *puntos "gatillo"*, capaces de desencadenar la crisis dolorosa al menor contacto. (Noguer and Balcells 1997:13)

(42) Es posible identificar puntos-**gatillo** al palpar estos músculos [...] (Waldman 2003:33)

These same authors recognize the use of metaphors by patients when describing pain: "en los dolores psicógenos, el enfermo recurre a *comparaciones bizarras o dramáticas*" (1997:12)

With reference to pain, MORE PAINFUL IS UP, LESS PAINFUL IS DOWN is another

widespread metaphor. In medical terms there exists the so-called "time-intensity curve" by Lewis, a scale that represents the development of pain (Noguer and Balcells 1997:11). This is based on a simple metaphor, in which more painful moments would be up, less painful down. Thus, terms to describe pain refer to a line, which can be "continuous", "descending", or "undulating".

(43) Así, encontramos un dolor "**continuo**", de **curso ondulante** o intermitente", etc. (Noguer and Balcells 1997:17).

(44) Si el **descenso** se presenta en seguida [...] (Noguer and Balcells 1997:11)

(45) Las exacerbaciones de un dolor pueden aparecer en forma fásica u **ondulante** con remisiones periódicas. (Noguer and Balcells 1997:11)

(46) En el angor, en la claudicación intermitente de la arteriosclerosis periférica y en otras isquemias, el dolor suele ser **progresivo**. (Noguer and Balcells 1997:11)

#### 4.1.4. Anatomy

Turning now to body description, one of the most recurrent metaphors is THE BODY IS A BUILDING. In keeping with this metaphor, terms from architecture (*wall, vault...*) are projected onto the description of different parts of the human body. Some evidence will be presented in section 4.2.

If doctors were considered explorers, the human body is a geographical area in the metaphor THE BODY IS A PLACE / A LANDSCAPE. This is a pervasive metaphor in anatomic descriptions: topographical terms are used to describe the body geography:

(47)

fosa supraespinosa (Noguer and Balcells 1997:27)  
fosas ilíacas (Noguer and Balcells 1997:29)  
hueco axilar (Noguer and Balcells 1997:27)  
campos de Krönig (Noguer and Balcells 1997:146)  
región frontal, temporal y occipital (Waldman 2003:12)

Further examples are 48 – 59 below:

(48) Líneas, eminencias, **zonas, fosas, espacios, puntos**, etc., de la **superficie** del cuerpo humano desde el punto de vista clínico [...]. (Noguer and Balcells 1997:23)

- (49) Clínicamente se describen en la **superficie** del cuerpo humano una serie de líneas, eminencias, etc. que sirven de puntos de referencia para la limitación y **topografía** de los órganos internos. (Noguer and Balcells 1997:23)
- (50) Es de gran interés la **topografía** de las tumefacciones, puesto que en la artritis reumatoide se afectarán preferentemente las articulaciones metacarpofalángicas e interfalángicas proximales [...] (Lience 1982:15)
- (51) La **proximidad** de la médula espinal y la salida de las raíces nerviosas obliga a que el bloqueo facetario cervical lo realice un médico experto que conozca la **anatomía regional** y las técnicas de tratamiento del dolor. (Waldman 2003:48)
- (52) Diafragma. Forma la base de la **cavidad** torácica y la **bóveda** de la **cavidad** abdominal. (Noguer and Balcells 1997:35)
- (53) **Erosión** es la pérdida, por traumatismo o enfermedad, de la epidermis y capas altas de la dermis. (Noguer and Balcells 1997:76)
- (54) Vesículas son **elevaciones** epidérmicas, circunscritas, de contenido líquido (seroso o hemorrágico), de pequeño tamaño. (Noguer and Balcells 1997:73)
- (55) Una **depresión** infraclavicular puede señalar una vasta **caverna** superficial del vértice del pulmón. (Noguer and Balcells 1997:125)
- (56) La oclusión de las coronarias, por esclerosis de las mismas, formando un trombo que obstruye la **rama** donde se organiza, una isquemia del **territorio** muscular irrigado con el infarto consiguiente, necrosis y posibilidad de ruptura o aneurisma. (Noguer and Balcells 1997:203)
- (57) Este dolor en el **territorio** de distribución de la primera **rama** del nervio trigémino se denomina zóster sin herpes. (Waldman 2003:7)
- (58) Mediante palpación se investigarán los **relieves** óseos (epicóndilo, olécranon y epitroclea). (Lience 1982:13)
- (59) En el **surco** retromalear interno discurren los del tibial posterior y de los flexores de los dedos. En el **canal** retromalear externo se hallan los tendones de los peroneos laterales y entre ambos **canales**, el tendón de Aquiles. (Lience 1982:18)

Furthermore, anatomic descriptions such as those above include verbs of movement and prepositions of place as if they were descriptions of a TRIP, following a path or a flow of water.

This can be clearly noticed in the next extracts from a description of the lungs:

- (60) Los anteriores, **partiendo** de los vértices, son primeramente convergentes, **encontrándose** el del lado derecho e izquierdo **a la altura** del ángulo de Louis, **descienden** luego, **verticalmente por detrás** del esternón muy próximos hasta la inserción de la cuarta costilla; el borde derecho **sobrepasa** la línea media y **llega hasta** la inserción de la quinta costilla. (Noguer and Balcells 1997:30)
- (61) Hablando de la **topografía** del pulmón [...] Las cisuras **parten por detrás** a la altura de la

tercera vértebra dorsal a nivel de la espina de la escápula y **se dirigen** oblicuamente hacia abajo y hacia delante; la *cisura derecha*, **al llegar** a la línea axilar [...] **se bifurca** en una cisura superior [...]. La *cisura inferior* sigue **trayecto** análogo a la cisura izquierda y **terminan** ambas en los bordes inferiores pulmonares respectivos [...].(Noguer and Balcells 1997:33)

Other organs are described in a similar way:

(62) El colon ascendente **se extiende** desde la **fosa** ilíaca al vacío derecho; el transversal **atraviesa** horizontalmente el mesogastrio y el vacío izquierdo. (Noguer and Balcells 1997:38)

(63) Los uréteres, de 26 a 30 cm de longitud y de un grosor de 5 mm **descienden** verticalmente y **desembocan** en la cara posterior y porción inferior de la vejiga. (Noguer and Balcells 1997:39)

(64) El nervio occipital menor **nace** de las ramas ventrales primarias del segundo y tercer nervio cervical. **Discurre** a lo largo del borde posterior del músculo esternocleidomastoideo, por encima del mismo, y **se divide** en ramas cutáneas que inervan la región lateral posterior del cuero cabelludo y la superficie craneal de la pinna del oído. (Waldman 2003:22)

This general metaphor is developed into some more particular instances as BLOOD IS CURRENT OF WATER. As many liquids, blood is seen as a river or even a sea:

(65) En cambio, los *síntomas retrógrados* representan siempre la obstaculización de la **corriente** sanguínea, **remansos** de sangre, alteraciones cuantitativas y distributivas de la misma [...] (Noguer and Balcells 1997:199)

(66) Ahora bien, como el ventrículo derecho seguirá mandando sangre a la circulación pulmonar y ésta no tendrá su **desagüe** en la aurícula y ventrículo izquierdos [...] (Noguer and Balcells 1997:199)

(67) **oleadas** de sangre (Noguer and Balcells 1997:260)

(68) [...] una dilatación “compensadora” de redes venosas vecinas para derivar la sangre **estancada** y favorecer su retorno, por otra vía, al corazón. (Noguer and Balcells 1997:266)

By way of summary, once these metaphors have been examined, it could be claimed that medical language has a need of expressiveness that is coped with through comparisons and metaphors as rich as the following:

(69) [on the exploration of the respiratory system] Estertores crepitantes o vesiculares: Es una lluvia de pequeñísimos chasquidos, como el chisporroteo de la sal en el fuego. Se imitan restregando con los dedos un mechón de cabello cerca de la oreja. Aunque húmedos, suenan como "secos". (Noguer and Balcells 1997:168)

#### 4.2. Medical terms

After the reflection on the previous metaphors, it will not be surprising to discover many terms for illnesses or injuries that exhibit a metaphorical origin. Some of these expressions have been gathered here to prove it (Table 1). Two source dominions are especially frequent: animals and everyday objects and tools. Places, as in anatomic descriptions, and building terms are also widespread.

Animals	Natural terms / vegetation	Architecture	Everyday objects	Others
<ul style="list-style-type: none"> <li>- mano en garra</li> <li>- labio leporino</li> <li>- deformidad en cuello de cisne</li> <li>- cola del páncreas</li> <li>- trompas</li> <li>- escamas</li> <li>- arañas o estrellas vasculares</li> <li>- ojo de buey</li> <li>- mano de simio</li> <li>- piernas de cigüeña</li> <li>- pie equino</li> <li>- voz de cabra o egofonía</li> <li>- traquea de ganso</li> <li>- marcha de pato</li> <li>- cola de caballo</li> <li>- marcha neurítica o de las parálisis periféricas o steppage</li> </ul>	<ul style="list-style-type: none"> <li>- depresión</li> <li>- cataratas</li> <li>- apéndice ciego</li> <li>- brote de una enfermedad</li> <li>- raíz de los dientes, raíces de los miembros inferiores</li> <li>- corteza cerebral</li> <li>- tronco</li> <li>- árbol</li> <li>- campos pulmonares</li> <li>- canales laterocervicales</li> <li>- erupción</li> <li>- cefaleas en racimos</li> </ul>	<ul style="list-style-type: none"> <li>- vía piramidal</li> <li>- acueducto de Silvio</li> <li>- tabique nasal</li> <li>- puente del cerebro</li> <li>- plaqueta</li> <li>- túnel del carpo</li> <li>- pilar diafragmático</li> <li>- pared torácica, pared costal, paredes musculares</li> <li>- bóveda craneal</li> <li>- pabellones auriculares</li> <li>- pilares del corazón</li> <li>- choque en cúpula</li> <li>- arco cigomático</li> <li>- túnel cubital</li> </ul>	<ul style="list-style-type: none"> <li>- dedo en martillo</li> <li>- imagen en punta de lápiz</li> <li>- manos en azadón</li> <li>- válvula del corazón</li> <li>- cayado</li> <li>- bastones de Auer</li> <li>- vasos arteriales y venosos</li> <li>- sifón carotidio</li> <li>- tienda del cerebelo</li> <li>- dedos en palillo de tambor</li> <li>- uñas en vidrio de reloj</li> <li>- uñas en cuchara (coiloniquia)</li> <li>- tórax en tonel / tórax inbuliforme o en embudo / tórax de pichón o en quilla</li> <li>- ruido de olla cascada</li> <li>- soplo anfórico / tubárico</li> <li>- estuche</li> <li>- cortina muscular</li> <li>- abdomen en tablero de damas</li> <li>- cuerdas cólicas</li> <li>- rigidez en tubo de plomo</li> <li>- anestesia en guante o en calcetín</li> <li>- marcha en tijeras</li> <li>- saco subcuadricipital</li> <li>- bolsas prerrotulianas</li> <li>- horquilla external</li> </ul>	<ul style="list-style-type: none"> <li>- soplo</li> <li>- tejido</li> <li>- costillas flotantes</li> <li>- piernas en sable</li> <li>- gemelos</li> <li>- vía de abordaje</li> <li>- danza arterial</li> <li>- codo de tenista</li> <li>- codo de golfista</li> </ul>

Table 1: Terms for illnesses or injuries that show evidence of a metaphorical origin



## 5. CONCLUSIONS

The following observations can be concluded after the metaphors witnessed along this paper:

a) Metaphors are customary in specialised medical language. Two motivations may be posited:

i) In contrast with traditional views, not only does metaphor not transmit a higher degree of subjectivity, but it conveys more clarity thanks to its *explanatory power*. This clarity is vital in scientific language. Throughout this paper examples have shown the expressiveness attained through metaphors and metonymies from several source domains.

ii) Metaphor achieves clarity owing to its capacity to *structure our conceptual system*, as claimed in the theoretical framework. We understand our new reality in terms of metaphor. For example, the metaphor THE BODY IS A PLACE helps to foster understanding of anatomic descriptions.

b) The metaphors in the texts analysed here are connected to our natural surroundings; that is, source domains within an easy reach for our senses (common objects, landscape, sounds) are mapped onto the target domains. Hence, the notion of embodiment is a key factor in the choice of metaphors.

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