

# **From the original article to the summary for patients: Reformulation procedures in intralingual translation<sup>1</sup>**

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*The wider access to information and the tendency toward patient education have increased the demand for medical texts aimed at a wide, non-specialized, heterogeneous audience. In this context, it is essential to know what procedures are required to make specialized knowledge accessible to non-experts. This paper presents a corpus-based exploratory study that describes the procedures employed to reformulate, intralingually, medical knowledge from a highly specialized genre, the original article (OA), into a genre derived directly from it but addressed to laymen, namely, the summary for patients (SP). The linguistic and textual changes that take place when translating an OA into an SP are taken as the basis for explaining the reformulation procedures used. The results of the study contribute to the characterization of the SP from a text genre perspective, and provide keys to writing and reformulating for both medical translators and experts in the field, who are often called upon to carry out these intralingual translations.*

## **1. Introduction**

Nowadays, the more widespread access to information has kindled people's interest in knowing "what scientists are up to" (García Palacios, 2001, p. 159, my translation). In the field of medicine, these aspects, together with the current tendency toward educating the patient, who is assuming a more active role when making decisions about his/her health, have increased the demand for texts that facilitate the transfer of medical knowledge to a wide, non-specialized, heterogeneous audience.

A growing number of publications written by and for specialists (such as the journal *Annals of Internal Medicine*) now include simplified versions of original research works that are reformulated and recontextualized (Ciapuscio, 2003, p. 210) intralingually to meet the needs of a lay audience. These expert-to-layman reformulations, called *intralingual translations* or *rewordings* in Jakobson's classification of the types of translation (1959/2000), have thus become an important practice today.

Intralingual translations do not conform with what translation theory traditionally calls *translation proper* (Zethsen, 2007, p. 281), that is, translation between different languages. Although these kinds of translation are governed by functional (Nord, 1997; Reiss & Vermer, 1984/1991) rather than linguistic factors, they may well be part of the multifaceted activity carried out by translators, "as most experts find it difficult to write

about their field in layman terms" (Zethsen, 2009, p. 809). In view of this situation and given the growing demand for texts aimed at a lay audience, it is important to know what procedures are required to reword specialized medical knowledge in order to reach the non-expert reader. This is especially relevant for those who carry out this activity, whether they are translators, editors or experts in the field.

This paper presents a corpus-based exploratory study that describes the procedures employed to reformulate medical knowledge from a highly specialized and conventionalized genre, that is, the original article (henceforth, OA), into a genre aimed at laymen that is "intergenerically derived" (Askehave & Kastberg, 2001, p. 491) from the OA, that is, the summary for patients (henceforth, SP). These genres share the same subject matter but differ mainly in terms of communicative purpose and target reader. The OA, also known as a research article, journal article, original investigation or original contribution, has been widely studied in the literature (Bhatia, 1993; Nwogu, 1997; Swales, 1990). It is a primary information genre, the communicative purpose of which is to make known the results of a research study in a rigorous manner and convince the reader of their validity. This demand for rigour implies the use of a fixed macrostructure (IMRD: Introduction, Methods, Results, Discussion) and a specialized jargon that is shared by the sender and the receiver, as both belong to the same community of specialists. The SP, nevertheless, is a relatively new popularizing genre exclusive to the biomedical field, given that in other disciplines there is no need for this communicative mediation (Montalt, 2005, p. 73). Usually following a question-and-answer structure, its main communicative purpose is to reformulate specialized medical studies<sup>2</sup> for laymen. Though it is increasingly used in medical journals,<sup>3</sup> associations,<sup>4</sup> or research institutes,<sup>5</sup> it has received very little attention in the academic literature.

The corpus of OAs and their corresponding SPs compiled for this study was analysed taking into consideration the concept of *text genre* (Bhatia, 1993; Swales, 1990) with its communicative, formal, and cognitive aspects (Montalt, Ezpeleta Piorno, & García Izquierdo, 2008). This approach allows us to identify a prototypical series of aspects such as participants, purpose, communicative situation, text conventions or readers' needs, which may govern the translator's decisions regarding the reformulation procedures to be used. Thus, comparing the characteristics of the source and the target genres may enable us to better understand and describe the linguistic and textual changes that take place when translating an OA into an SP intralingually, that is, when performing an *intergeneric translation* (Askehave & Zethsen, 2001), *expert-to-layman translation* (Zethsen, 2007, p. 301) or *genre shift* (Montalt & González Davies, 2007, p. 163).

The article is organized as follows: Section 1.1 reviews some of the most common popularization and reformulation procedures found in the

literature; Section 2 explains the characteristics of the corpus and the method of analysis; Section 3 describes the reformulation procedures from a macro and microtextual point of view; and, finally, Section 4 discusses the procedures analysed and presents some concluding remarks.

### **1.1. Popularization and reformulation procedures**

The procedures for popularizing or reformulating scientific knowledge have been addressed by disciplines such as translation studies, linguistics, discourse studies or scientific journalism, among others. Either from an intralingual perspective (Adams Smith, 1987; Askehave & Kastberg, 2001; Ciapuccio, 2003; Gutiérrez Rodilla; 1998) or from an interlingual point of view (Albin, 1998; Askehave & Zethsen, 2001, 2002; Mayor Serrano, 2005; Montalt & González Davies, 2007), these contributions describe or prescribe the reformulation procedures in expert-to-layman communication or the characteristics of popularizing genres by taking different genres (popular articles, patient package inserts, patient information leaflets, etc.) as a reference. Though none of these works focus on the SP (given the lack of studies centred on this genre), they can serve as a reference since those genres share the same reader and overall social function as the SP.

A review of the abovementioned contributions reveals that the reformulation procedures to be applied either intralingually or interlingually are varied and affect the text on both the macrotextual (content, structure and organization of information) and the microtextual (morphosyntactic and lexical mechanisms) levels. Most authors agree on putting the emphasis on the procedures used in order to clarify the terminology, which is “the most obvious barrier” (Ciapuccio, 2003, p. 222) and, at the same time, the most characteristic trait of specialized scientific genres.

In Table 1 below we classify the most commonly mentioned procedures according to the macrotextual and microtextual aspects that may be subject to modification:

Table 1. Reformulation procedures found in the literature reviewed

Level	Aspect affected	Procedures to be used
Macrotextual	Title	<ul style="list-style-type: none"> <li>• Rewording the title to make it more attractive, revealing and definite, and less descriptive.</li> </ul>
	General structure	<ul style="list-style-type: none"> <li>• Restructuring the overall text.</li> <li>• Shortening the length of paragraphs.</li> </ul>

	Content	<ul style="list-style-type: none"> <li>• Selecting the most relevant information.</li> <li>• Eliminating information considered not relevant (e.g., statistical data).</li> <li>• Adding topics not found in the original.</li> <li>• Making the applications of the study and social consequences prevail over the scientific environment.</li> </ul>
	Typography, layout and visual support	<ul style="list-style-type: none"> <li>• Incorporating visual elements (figures, illustrations and tables).</li> <li>• Using vertical numbered or bulleted lists for listing elements.</li> <li>• Avoiding capital letters.</li> <li>• Emphasizing keywords.</li> <li>• Avoiding justification, hyphenation and footnotes.</li> </ul>
Microtextual Morphosyntax	Sentence length and structure	<ul style="list-style-type: none"> <li>• Shortening sentences.</li> <li>• Simplifying complex syntactic structures.</li> </ul>
	Verbs	<ul style="list-style-type: none"> <li>• Giving preference to transitive verbs and simple tenses.</li> </ul>
	Voice	<ul style="list-style-type: none"> <li>• Increasing the use of the active voice.</li> </ul>
	Noun phrases	<ul style="list-style-type: none"> <li>• Replacing noun phrases by verbal clauses.</li> </ul>
	Tenor	<ul style="list-style-type: none"> <li>• Addressing the reader directly.</li> </ul>
	Punctuation marks	<ul style="list-style-type: none"> <li>• Increasing the number of punctuation marks to introduce explanations, definitions, etc.</li> </ul>
Microtextual Lexis	Technical terms or concepts	<ul style="list-style-type: none"> <li>• Keeping the technical term and adding explanations/metaphors/comparisons/exemplifications.</li> <li>• Eliminating the technical term and replacing it with: pseudo-equivalents/explanations/paraphrases.</li> <li>• Rewording abstract concepts in a non-abstract manner.</li> <li>• Using redundancy techniques (repetitions, synonyms) for complex concepts.</li> </ul>

This brief review will be used as the basis for the analysis of the changes observed in our corpus. This may allow us to detect whether there are characteristics or reformulation procedures that are prototypical of the SP genre.

## 2. Materials and methods

For the analysis, ten OAs and their corresponding SPs were selected.<sup>6</sup> All of them were taken from *Annals of Internal Medicine* (<http://www.annals.org/>), a leading internal medicine journal and one of the most cited worldwide. This journal, established by the American College of Physicians, publishes a wide variety of information on internal medicine and related topics, among which OAs are the most frequent publication. These OAs obey the general IMRD structure, are preceded by an abstract, and include acknowledgements, references, figures and, if necessary, appendices.

As previously mentioned, the journal also includes information aimed at laymen. The preparation of the SPs and the *Patient Information Pages*,<sup>7</sup> which provide general information about common health conditions, constitutes the journal's initiative to publish specialized information for non-experts. On the *Annals of Internal Medicine*'s website, SPs are described as: "brief, non-technical summaries of studies and clinical guidelines [...]. The Summaries aim to explain these published articles to people who are not health care providers".<sup>8</sup>

The overall social function of SPs is thus to make medical knowledge more widely known, and their rhetorical purpose is to explain information about a specific study on internal medicine. They are addressed to a non-expert reader who, as happens with scientific magazines, may be interested in medicine but has no medical background. These SPs include bibliographic information about the OA on which they are based and a message informing the reader of the purpose of the summary.

The ten OAs were chosen according to the following criteria:

- Having open access (the most recent OAs are not available);
- Having an SP, because many do not;
- Being fairly recent (from 2005 to 2011).

Additionally, efforts were made to include OAs covering diverse areas within internal medicine.

Once the OAs and their SPs had been chosen, a qualitative analysis of the linguistic and textual changes that take place when translating an OA into an SP was carried out. These changes are viewed as the results of the author's strategic choices about the procedures to be used to reformulate specialized knowledge. The summary of the main procedures found in the literature (Table 1) was used as a basis to carry out the analysis. The procedures were thus approached according to the textual levels that could be modified: on a macrotextual level, aspects such as title, structure, length, content and typographical variations were taken into account. On a microtextual level, sentence length and structure, verbs, voice, noun phrases, tenor, modality and management of specialized terms were

analysed. To illustrate the analysis, examples taken from the OAs are compared with their SPs.

### **3. Analysis and results**

In this section, the linguistic and textual changes found in our corpus will be described from a macro and microtextual point of view.

#### **3.1. Macrotextual level**

On a macrotextual level, we will focus on the main changes concerning title, structure, length, content, and typography and layout.

##### **3.1.1. Title**

The main aim of an OA title is to provide as much information as possible about the content and objective of the study. This is the reason why it is usually “long, precise and informative” (Busch-Lauer, 2000, p. 92). In the case of the SPs analysed, eight of the ten titles are shortened as well as simplified. They retain the same descriptive nature but are less dense in content, tend to omit details on the methods applied, and contain fewer technical terms:

- (1) [OA] The Risk for Myocardial Infarction with Cyclooxygenase-2 Inhibitors: A Population Study of Elderly Adults.

[SP] Risk for Heart Attacks with Different NSAIDs.

##### **3.1.2. Structure**

The standard IMRD structure of the OA is transformed into a series of questions and answers that respond, in essence, to the questions posed in a research study, albeit in a highly simplified manner. Each SP section has the same rhetorical purpose as the sections of the OA. Table 2 below shows the sections that form the SP and how they relate to the OA.

Table 2. Structure of the OA and the SP

Structure of the OA	Structure of the SP	Rhetorical purpose
Introduction	What is the problem and what is known about it so far? Why did the researchers do this particular study?	Define the problem, prove it is interesting, and establish the hypothesis and objective.
Methods	What was studied? How was the study done?	Explain what was studied and how.
Results	What did the researchers find?	Provide information about the results obtained.
Discussion	What were the limitations of the study? What are the implications of the study?	Explain the results in the context of the study.

### 3.1.3. Length

The OAs analysed have an average of 7665 words, whereas the SPs only have 492 words, so the original content is reduced by more than 90%. Apart from this reduction, there are certain contents of the OA that are always omitted in the SP, namely: the abstract that precedes the article, the references, the appendices, and the visual elements (figures, tables and graphs).

### 3.1.4. Content

As a considerable reduction of information has been carried out, we shall examine what information remains in each section and what was omitted.

The section *What is the problem and what is known about it so far?* is the longest (about 40% of the total). Here, the content originating directly from the OA is minimal, since most of it is not explicitly stated in the OA. This is contextual information that is assumed to be known by a reader belonging to the research community, but that is made explicit for a reader without such background knowledge. Let us examine an example of the first few lines from an OA and its corresponding SP:

- (2) [OA] Rapid ascent to altitudes greater than 2500 m may cause acute mountain sickness (AMS) and high-altitude pulmonary edema (HAPE). In nonacclimatized mountaineers, the prevalences of AMS and HAPE at 4559 m are approximately 50% and 4%, respectively.

[SP] There is less oxygen in the air at high altitude than at sea level. Many people who live at sea level travel to high altitude for recreational purposes. Some people become ill shortly after arriving at high altitude. Illness at high altitude is caused by the effects of low oxygen levels on the blood vessels, lungs, and brain. About 50% of people who ascend rapidly to high altitude develop acute mountain sickness (AMS), characterized by headache, nausea, fatigue, light-headedness, and insomnia. Four percent of people develop a life-threatening illness, high-altitude pulmonary edema (HAPE), characterized by fluid accumulation in the lungs that blocks oxygen uptake, causing shortness of breath and even death if effective therapy is not provided. Doctors treat both AMS and HAPE with extra oxygen to breathe.

As we can observe, the amount of contextual information added is significant. The two diseases and the reasons why they occur are explained, as well as their symptoms and how they are treated. In contrast with this, very detailed information, such as the specific altitudes, is omitted and conveyed to the reader with the adjective “high” only.

The section *Why did the researchers do this particular study?* clearly corresponds to the purpose of the study, which in the OA is usually expressed in the last lines of the introduction:

- (3) [OA] In our study, we examined whether initial treatment for early breast cancer differed between women who qualified for Social Security Disability Insurance (SSDI) and Medicare at diagnosis and other women younger than 65 years of age and the extent to which observed differences in breast cancer treatment relate to survival.

[SP] To see whether women with localized breast cancer and disabilities are treated differently from and live as long as those without disabilities.

As we can see, the purpose of the study is explained more simply, and the amount of detail (e.g., information concerning the age or the insurance) is reduced.

The sections of the SP that correspond to the OA methodology, *Who was studied?* and *How was the study done?*, only provide information relevant to the design of the study and its participants. The section *Who was*

*studied?* is the shortest (70% of the cases are summarized in a single sentence). As we can see in the example to follow, the SP only includes information about the total number of participants and their main characteristics with regard to the purpose of the study. The OA provides more detailed and complex information (such as participants' inclusion and exclusion criteria, state of health, origin), which has not been included in this paper due to space limitations:

- (4) [SP] 216 adults who still needed a breathing machine 4 days after heart surgery.

The section *How was the study done?* is more extensive than the previous one, although the simplification and the selection of information are also dominant procedures. Statistical data are completely eliminated and technical terms avoided, such as those defining the type of study (randomized, prospective, single-blinded, controlled, etc.). As the example shows, these terms are replaced by paraphrases, a procedure that will be explained in Section 3.2.2.2.:

- (5) [OA] Participants and study personnel responsible for follow-up assessments were blinded to treatment assignment.

[SP] [...] neither the patients nor the researchers who assessed adverse events were told which patients received vaccine or placebo.

Despite this tendency to simplify and reduce information, we also find additions with the aim of making contents easier to understand. In the example below, the equivalent unit of measurement in the target culture is provided along with the international one:

- (6) [SP] [...] an altitude of 4559 meters (*14,000 feet*)<sup>9</sup>

With regard to *What did the researchers find?* the main results of the study are explained by giving only general information, thus avoiding the use of statistical analysis data (medians, IQR, probabilities, test results, etc.):

- (7) [OA] The 3-month Kaplan-Meier estimates of pneumonia in the nectar-thick and honey-thick liquid groups were *0.084 (10 events)* and *0.150 (18 events)*, respectively (*HR, 0.50 [CI, 0.23 to 1.09]; P = 0.083*).

[SP] *About 15%* of the patients who drank honey-thick liquid and *about 8%* who drank nectar-thick liquid developed pneumonia.

There are even cases where the reasons that could cause such results are specified, although this information is not included in the original:

- (8) [OA] The median time taken to administer epinephrine for the mass concentration group was 35.5 seconds (IQR, 27.0 to 65.0 seconds) compared with 130.0 seconds (IQR, 112.0 to 171.0 seconds) for the ratio group ( $p \leq 0.001$ ). The adjusted mean time was 91.0 seconds (CI, 61.0 to 122.1 seconds) (Table) greater in the group using a ratio rather than mass concentration label.

[SP] *Because they had to figure out how much drug to give*, the doctors using ampules labeled with a ratio also took about 1.5 minutes longer to give it.

As we can see, another procedure used to simplify the results is the conversion of seconds into minutes, which may be easier for the reader to understand at first sight.

Finally, the sections *What were the limitations of the study?* and *What are the implications of the study?* focus on explaining its main limitations and implications. As the example shows, generally only some of these limitations/implications are mentioned—possibly the most relevant ones. Moreover, these are not usually explained in the order in which they appear in the OA:

- (9) [OA] Our study had some limitations. *First*, while we did not observe any increased risk with the use of meloxicam, traditional NSAIDs, or naproxen, our power to detect meaningful differences was limited by the unexpectedly low use of these agents. *Second*, only case-patients admitted to the hospital were included in our analysis. [...] *Third*, we did not have information on smoking status, obesity, physical activity, family history, and socioeconomic status. [...]. While a major strength of this study has been our accounting of the risk-modifying effects of aspirin, concern may exist about the possibility of misclassification due to missing information on over-the-counter use of aspirin, as well as ibuprofen [...]

[SP] The researchers did not assess over-the-counter use of aspirin and ibuprofen and whether people took prescribed amounts of NSAIDs [*fourth limitation*]. The researchers had limited ability to detect risks of meloxicam, naproxen, and traditional NSAIDs because most NSAID prescriptions were for rofecoxib and celecoxib [*first limitation*]. The researchers may have missed some heart attacks since the study databases recorded only heart attacks that led to hospitalization [*second limitation*].

In this example one can also observe that other procedures affecting terms and concepts are used: abstract and technical notions are specified (“low use of these agents” becomes “most NSAID prescriptions were for rofecoxib and celecoxib” and “case-patients admitted to the hospital” is conveyed as “heart attacks that led to hospitalization”). We will focus on these kinds of procedure in Section 3.2.2.

### 3.1.5. Typography and layout

Several typographical variations are introduced into the SPs:

- The columns showing the content of the OAs are eliminated;
- The text is aligned to the left as opposed to justified;
- In contrast to the OA, hyphenation is avoided.

## 3.2. Microtextual level

Now that the changes on a macrotextual level have been described, in this section the procedures that lead to lexical and morphosyntactical modifications will be analysed.

### 3.2.1. Morphosyntax

Regarding morphosyntax, procedures affecting sentence length and structure, verbs, voice, noun phrases, tenor, modality, and punctuation marks will be analysed.

#### 3.2.1.1. Sentence length and structure

The sentence structure is simplified considerably. This simplification becomes apparent in terms of both the length (sentences tend to be shorter) and the morphosyntactical and lexical structure:

- (10) [OA] Study personnel who reconstituted the vials and inoculated the participants [...].  
[SP] Staff injecting the solution under the skin [...].
- (11) [OA] The patient simulator was programmed to mimic development of acute anaphylaxis with hypotension profound enough to warrant 0.12 mg of intramuscular epinephrine, according to the protocol.

[SP] The researchers programmed a medical mannequin to look like it was having a life-threatening allergic reaction.

As we can see, specific details (such as the characteristics of the allergic reaction) are omitted; the ideas conveyed are reworded with a more accessible language (“to mimic development of acute anaphylaxis” becomes “look like it was having a life-threatening allergic reaction”); words of a Latin or Greek origin (inoculate, mimic) are avoided (on the subject of these last two points see Examples 26 and 27), and the logical sentence structure (subject/verb/object) is followed.

Paradoxically, in many cases the process of simplifying concepts leads to the use of a larger number of words, as abstract concepts need to be clarified (in the example below, “immediate early tracheotomy” and “prolonged intubation”):

- (12) [OA] patients [...] were randomly assigned to *immediate early tracheotomy or prolonged intubation* with tracheotomy only when mechanical ventilation exceeded day 15 after randomization.

[SP] Patients were randomly assigned to have an early tracheotomy done in the intensive care unit within 1 day or breathing support continued through a tube already inserted into the mouth for up to 2 weeks, at which time tracheotomy was considered.

### 3.2.1.2. Verbs and voice

Preference is given to the active voice. Many passive sentences are replaced by active transitive ones for the sake of simplification:

- (13) [OA] In the tadalafil group, 2 participants developed severe AMS on the evening of arrival at 4559 m and *were withdrawn* from the study.

[SP] Two participants taking tadalafil *dropped out* after developing severe AMS on the evening of arrival at altitude.

In this example, again other procedures are also used: omission of specific details (4559 m), and shortening and simplification of sentences (preference for verbal clauses, that is,, “Two participants taking tadalafil” to noun phrases, that is, “In the tadalafil group, 2 participants”).

### 3.2.1.3. Noun phrases

As already shown in the above example, there is a clear preference for using verbal clauses as opposed to noun phrases. We can find more examples in the following extract:

- (14) [OA] A general recommendation for use of dexamethasone in prophylaxis against HAPE and AMS in adults who are susceptible to HAPE cannot be made on the basis of our findings *because of the limited number of highly selected participants*, the participants' short exposure to high altitude, the single-center nature of this study, and the *lack of assessment of adverse side effects*.

[SP] The researchers *were not able to recruit as many participants as they had planned*. The study *did not evaluate the adverse side effects of each medication*.

### 3.2.1.4. Tenor

Tenor is adjusted to achieve a more personalized communication. The impersonality of scientific discourse is reduced in the SPs by giving more visibility to the authors of the study. This is also achieved by increasing the number of sentences written in the active voice:

- (15) [OA] *Participants were enrolled* in this 3-month follow-up study [...].

[SP] *Researchers followed* patients for 3 months [...].

### 3.2.1.5. Modality

Scientific uncertainty is made apparent in the OAs by the frequent use of modal verbs and adverbs of doubt. The SPs are more conclusive when presenting the results, and there is a clear tendency to avoid modal verbs and replace them with more definite assertions. The declarative modality prevails over the hypothetical one:

- (16) [OA] Third, *our findings may not generalize* to persons with disabilities who, for whatever reason, do not apply or qualify for SSDI and Medicare.

[SP] Also, *the findings apply only* to women with disabilities who received disability benefits from the federal government.

### **3.2.1.6. Punctuation marks**

Finally, the increased number of determinologization procedures such as definitions, explanations, and examples increase the usage of punctuation marks with a metalinguistic function, especially parenthesis:

- (17) [SP] Complications of colonoscopy include perforation (*a hole in the wall of the colon*) [...].

These determinologization procedures will be analysed in detail in the next section.

### **3.2.2. Lexis**

The procedures for determinologizing technical terms and concepts usually take place at the beginning of the SP, in the section *What is the problem and what is known about it so far?* In the rest of the SP it is less common to find these kinds of procedure, maybe because key concepts have already been clarified. Let us now analyse all these procedures in detail.

#### **3.2.2.1. Technical terms that are kept**

The most common practice is to keep the technical term but to accompany it with an explanation or definition that is placed either before or after the term itself. Normally the explanation precedes the medical term, which generally appears in parenthesis and sometimes after a reformulator such as *this is called*:

- (18) [SP] Some persons with dementia, Parkinson disease, stroke, or other neurologic conditions *have difficulty with swallowing (dysphagia)*. [...] During coughing or choking, they may inhale liquid or food through their windpipes into their lungs; *this is called aspiration*.

In other cases, it is the specialized term that precedes the explanation, definition or specification of the word (see also Nisbeth Jensen & Zethsen in this issue):

- (19) [SP] More recently, researchers have suggested using *tadalafil* (*a medicine often used to treat erectile dysfunction*).

Although it is not the standard practice, we also find examples where both variants (explanation before and after the technical term) are used in the same paragraph:

- (20) [SP] Sometimes doctors use colonoscopy *to look for the cause of a patient's symptoms* (*diagnostic colonoscopy*). Another use of colonoscopy is to look for polyps (*growths that can become cancer*) [...].

At times, the term is followed by a lay synonym. This is usually put in quotation marks to highlight the fact that it is a colloquial term:

- (21) [SP] Herpes zoster (*also called “shingles”*) is a condition in which painful blisters develop on the skin along the path of a nerve.

Occasionally examples that do not appear in the OA or comparisons that help the reader associate complex concepts with daily life are provided:

- (22) [SP] People commonly use nonsteroidal anti-inflammatory drugs (NSAIDs) to relieve pain. *Examples of NSAIDs include aspirin, etodolac (Lodine), ibuprofen (Advil or Motrin), and naproxen (Aleve).*
- (23) [SP] Patients given thickened liquids were randomly assigned to drink either a very thick liquid (*the consistency of honey*) or a less thick liquid (*the consistency of nectar—for example, tomato juice*).

The comparison can also be expressed with the use of words that have “-like” added to them:

- (24) *cortisone-like* drug known as dexamethasone.

### 3.2.2.2. Technical terms that are omitted

In very few cases, technical terms are eliminated and replaced by more colloquial pseudo-equivalents (i.e., of a non Greek or Latin origin). This procedure is most frequently used for terms that may not be so relevant to the SP:

- (25) [OA] *Myocardial infarction.*

[SP] Heart attack.

- (26) [OA] [...] *exacerbations* of pre-existing diseases; new local or systemic illnesses.

[SP] [...] *worsening* or new illnesses.

Other cases where Latin-Greek terms are avoided or substituted by everyday English words are found in Examples 10 and 11 (see Section 3.2.1.1.).

Finally, paraphrases are sometimes used to substitute technical terms or abstract concepts (see also Example 5 in Section 3.1.4.):

- (27) [OA] second-line treatment options [...]

[SP] [...] options for other drugs they could take.

#### 4. Discussion and conclusions

As we have seen, the intralingual translation of an OA into an SP involves the use of various reformulation procedures that affect both content and form. Our analyses show that many of them coincide with those used in other popularizing genres, as reviewed in Table 1.

The selection of the key original content is fundamental to the SP, since this genre must be much shorter than the OA. For this, it is essential that the writer determine the main ideas properly and then choose the most relevant and interesting ones for the reader. This strategy requires both having substantial knowledge of the original contents and taking readers' needs into account.

This selection procedure leads to the elimination of the content considered irrelevant or too complicated for the new target reader. This is especially apparent on the macrotextual level (elimination of the abstract, references, visual elements, and other "irrelevant" content such as statistical analyses), but also on the sentence level (very specific details are omitted or transmitted in a more general way). This procedure, common in other popularizing genres, helps the non-expert understand the core of the study and not get lost. The emphasis is thus more on the general results than on the basic scientific and methodological content.

Although the selection and elimination of content is significant, the addition of completely new information is one of the most distinctive procedures used. It plays a fundamental role, despite the fact that the ability to summarize is essential to the SP. Relevant specific information about key concepts is added or made explicit for a reader who does not have the same knowledge about the subject as the writer. This contextual information is

usually presented at the beginning of the text, when the reader might feel displaced. This serves to capture the reader's interest, and to make the topic more attractive and akin to his/her own experience. This procedure is more obvious in the SP than in other genres addressed to a lay audience, in which new information seems to be only occasionally added (see Askehave & Kastberg, 2001).

The reorganization of the structure in questions and answers could also be considered a genre-specific procedure. The discourse is organized within a pre-established super-structure, parallel to that of the OA, yet adapted to the new communicative situation and to the knowledge and expectations of the receiver, who may be unaware of what the IMRD sections imply. The questions contribute to the involvement of the reader (Mayor Serrano, 2005, p. 135), and help him/her "build a mental picture of the facts he/she is reading" (Gutiérrez Rodilla, 1998, p. 325, my translation).

On the sentence level, morphosyntactic simplification is another key procedure in this genre. It is achieved by making sentences shorter in most cases (with the consequent omission of details), and by carrying out different kinds of substitution that usually coincide with those mentioned for other popularizing genres: noun phrases are replaced by verbal clauses, modal expressions by more definitive assertions, and passive sentences by active ones. The change of passive to active is also due to a change in tenor, which gives researchers more visibility. Readers, however, are not addressed directly (as the work by Askehave & Kastberg 2001, shows), a fact that could be explained by the rhetorical purpose: SPs are meant to be descriptive and informative rather than instructive (as patient package inserts or patient information leaflets would be). Another element that is also simplified is the main title, which is made shorter, less dense in content, and easier to understand. Its characteristics, however, do not coincide with those stated by the authors reviewed, since SP titles are not attractive and revealing. This aspect could be justified by the medium in which SPs are published. They are not published in the mass media but are made available on a highly specialized medical journal's website. Hence their titles conserve the more formal and objective quality of the journal.

The handling of terminology favours the use of a large number of determinologization procedures: explanation and definition of technical terms, specification of abstract concepts, comparison of complex notions to aspects of daily life, paraphrasing of specialized concepts, and addition of lay synonyms, among others. Metaphors, however, are not used to explain specialized concepts, despite being widely referred to in the contributions reviewed. All these procedures increase the use of punctuation marks with a metalinguistic function. On the other hand, the preference to conserve specialized terms (they are rarely eliminated from the text) supports the didactic, albeit secondary, role of the SP genre.

Finally, regarding typography and layout, there is no addition of visual elements, despite being a procedure mentioned in the literature. This could also be considered a characteristic feature of the SP. Furthermore, key concepts are not visually highlighted with the intention of aiding readability. This could be explained by the fact that the didactic function in this genre is secondary. If the genre were primarily didactic, stressing the key concepts would be more justified. However, other kinds of procedure, such as elimination of hyphenation and of text justification, are used to enhance readability.

As we can see, although the SP shares traits in common with other popularizing genres, it has characteristics and requires procedures that could be considered prototypical of the genre, such as: adding a large amount of contextual information that does not appear in the original; reorganizing the information following a question-and-answer structure that answers the questions posed in a research study; keeping and explaining technical terms rather than eliminating them or replacing them with pseudo-equivalents or paraphrases; rewording titles to make them shorter and simpler yet not very attractive, or avoiding visual elements. The results help to define the SP from a text genre perspective, and show the relevance of taking into account genre characteristics when carrying out a genre shift, since these determine the selection of the reformulation procedures to be used. Furthermore, these findings provide keys to writing and reformulating for medical translators, who need to be increasingly more versatile, and for experts in the field, who are often called upon to carry out these intralingual translations.

Regardless of the limitations of the study (the size of the corpus and the fact that the SPs were taken from only one source), this work shows the importance of describing the reformulation procedures needed to popularize the results of medical studies within an “authentic healthcare culture” (Salvador, 2011, pp. 96-97, my translation) such as the one we currently find ourselves in, which is increasingly more interested in patient education. We should take into account the fact that the procedures described in this paper are those used in this specific context. This does not imply, however, that they are the only ones or even the most suitable. Further research should be carried out with patients and the general public in order to evaluate the readability of the SPs. Such studies would shed light on the effectiveness of the procedures used.

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<sup>2</sup> Similar initiatives to publish summaries for patients from other genres such as guidelines ([http://www.eastonad.ucla.edu/guidelines/AAN\\_Guideline.pdf](http://www.eastonad.ucla.edu/guidelines/AAN_Guideline.pdf)) or conferences/symposiums (<http://www.aamds.org/sites/default/files/SymposiumPatientSummary.pdf>) have also been undertaken.

<sup>3</sup> Such as Annals of Internal Medicine (<http://www.annals.org/>).

<sup>4</sup> Such as the European Association for the Study of Diabetes (<http://www.easd.org/>).

<sup>5</sup> Such as the Pediatric Brain Tumor Consortium from the National Cancer Institute ([http://www.pbtc.org/public/protocol\\_summaries.htm](http://www.pbtc.org/public/protocol_summaries.htm)).

<sup>6</sup> The corpus is available at: <http://www.tradmed.uji.es/documents/Corpus.zip>.

<sup>7</sup> <http://www.annals.org/site/patientinformation/patientinformation.xhtml>.

<sup>8</sup> <http://annals.org/SS/PatientInformation.aspx>.

<sup>9</sup> Italics in the examples indicate my emphasis.