

Reintroducing communication as a strategy in printed evidence-based
medical materials. Model to assess effectiveness.

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ABSTRACT

Hypotheses on the efficiency of evidence-based printed materials can be directed by health communication concepts. These concepts can provide a general framework that goes beyond the traditional vulgarization point of view: instead, it points towards a strategy to obtain health outcomes and provoke behavior change, from a disease prevention, management and health promotion perspective.

The present study proposes a comprehensive framework based on concepts from health risk communication, Tarde's theory of social values, usability, readability and plain language. Using the mapping approach, an evaluation grid was applied to printed evidence-based materials with proven effectiveness, in order to reveal the underlying strategy and isolate the characteristics of effective materials.

The results allowed us to define two types of printed evidence-based materials, according to the robustness of the evidence they contain and the target audience. It was also possible to identify indicators of notions that are translated into operationalized items, frequent in those materials that might be responsible for their efficiency: clear purpose of the documents, limited scope, learning motivation and correspondence to the logic, experience and language of readers. Effectiveness of printed evidence-based materials could also be correlated to numeracy, objectiveness, standard definitions, constant timeframes and denominators, risks enumerated in order of importance, effective response, and high degree of threat, urgency, novelty and visibility of the disease.

It was also possible to identify some missing communication concepts: cultural diversity, narrative, increased easiness of procedures and aesthetic advantage for the patient.

In the process of work, the theory of social values emerged as a dynamic component that can bring together and explain many concepts, as well as physician's acceptance of the guidelines. Value in terms of usefulness and truth plays a major role in cognitive appreciation of the documents. This concept gives a strategic meaning to the whole work and allows us to better understand attitude and behavior change.

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1. Introduction

Evidence-based medical practice is an interdisciplinary (Rosswurm & Larrabee, 1999) approach which objective is to inform and guide clinical decisions and help decision-makers and patients understand the benefits, risks and financial consequences of treatments. A panel of independent researchers and medical experts following strict research and ethical protocols (Aro, 2005; Dearing, 2009) evaluates the best available evidence-based data, using methods from engineering, statistics, library and information sciences. After collecting and reviewing this data, they synthesize the results and contextualize them in order to implement the research findings within the larger body of knowledge.

The findings of evidence-based practice, systematically developed for specific clinical circumstances (Eccles et al., 1999; Virgilio, 2007), are usually communicated to health-care professionals through printed education materials: scientific journals, guidelines, etc. and distributed by mail, personal interventions and reminders (Farmer & al., 2009; Gill, 2011).

This process is not straightforward - a large and well-documented gap exists between research and practice in many areas of public health and health care (Glasgow et al., 2007; Green et al., 2009; Lowe et al., 2011). Even when information, ideas and policies reach the intended users, the effective application tends to wane, deviate from the intended use, or take on new forms (Green et al., 2009, Hardeman et al., 2000; Grimshaw et al., 2006; Mosca & al, 2011). Multiple reasons can be given for the general failure to translate evidence-based medical recommendations into practice (Greenlagh et al., 2004), including social, economic, scientific, cultural and organizational factors. In order to fill this gap, a variety of theories and models of knowledge transfer were proposed, with no success, except revealing

even more the stumbling in the matter (de Leeuw, 2011; Grimshaw et al., 2004, 2006; Rycroft-Malone, 2006). Basically, evidence implementation research was focusing on the two endpoints of the evidence data creation: at the beginning, after the data collection and analysis, researchers established narrower and stricter criteria, streamlining and customizing the research (Cohen et al., 2008; Grimshaw et al., 2006). On the user's end of diffusion and distribution of evidence, they were trying to understand and predict user's behavior from a psychological view – intentions, perceptions, knowledge and decisive factors of behavior change (Michie et al., 2010; Ajzen, 2002; 2011).

As a result, behavior-change was always assessed through from the point of view of research and psychological theories, but never from the perspective of health communication. Still, evidence-based materials remain communication tools and only related theories can determine the form, content and underlying concepts of the message they contain. Health communication is a necessary auxiliary to all other disciplines, because it can give an answer to many questions, such as why some messages reach their audience and some don't, what are the reproducible elements of a good message and what structure can be recommended.

The present study aims to examine the components of the message from the point of view of communication theories. These theories include health risk communication (Fischhoff, 2011; Fagerlin, 2011), theory of social values according to Tarde (1902) and concepts for usability (Newhauser, 2011), plain language (Doak, 1995, 2008), learning motivation (Doak, 2008), narrative (Salmon et al., 2005) and cultural diversity (Geist-Martin et al., 2003). The study proposes an evaluation grid based on those operationalized concepts, taking into consideration appearance, content and their underlying elements,

which contribute to more efficiency and impact. Evidence-based medicine is a cognitive assessment of risks and benefits of health technologies. It can be understood through the view of the sensation-seeking theory (Witte, 2000; Patty, 2008; Ruder & al., 2010; Normal & Boer, 2005), health risk communication (Fischhoff, 2011) and the concepts of value as presented by Gabriel Tarde (1902). The theory of social values is especially pertinent with the concepts of value-beauty, value-usefulness and value-truth, which can be all viewed as credibility (Latour & Lépinay, 2009) or “valeur-crédit”.

The Evaluation grid will help analyze medical printed education materials defined as effective by the Cochrane Collaboration¹ (Légaré et al., 2008). The presence or absence of some elements will give a more complete picture of the variety of materials distributed to physicians and we will be able to establish a clear distinction between materials. The results will lead to a discussion on the common and missing communication concepts in those materials and how they can be correlated to their efficiency. This Evaluation grid can be a foundation for standardized descriptions regarding the relevance, in terms of efficiency, and reproducibility of some elements, whether they are concepts or indicators.

¹ Cochrane Collaboration is an international network to help healthcare providers, policy-makers and patients and their advocates, make well-informed decisions about health care, by preparing, updating, and promoting the accessibility of Cochrane, published online in the Cochrane Database of Systematic Reviews, part of The Cochrane Library. The organizations prepares also the largest collection of records of randomized controlled trials in the world, called CENTRAL, published as part of The Cochrane Library.

2. Theoretical Framework

As mentioned before, the proposed evaluation framework takes into account various theories used in health communication. One of the most important theories in the field is risk communication – after all, health messages contain information about risks and benefits, and they are inherent part of health campaigns. Recent research in health communication also pointed to the importance of readability, usability, plain language, as factors contributing to the straightforward transmission of a message. But, once understood, those messages have to be accepted by physicians as valuable information. And this cognitive assessment of the message is best explained by Tarde’s theory of social values and its concepts of value as truth, as usefulness and as beauty. In the process of work, we did a preliminary analysis of the evidence-based printed materials, in order to assess the relevance of health communication theories and the presence of absence of various theoretical concepts², a process that resulted in the adoption or rejection of some theories. The final version of the proposed Evaluation grid lists only the relevant concepts that can be found in effective evidence-based printed education materials (EBPEM). In a way, we were guided by the health communication concepts that were present in those effective EBPEM. In communication, sometimes it is not enough to provide comprehensible information about the risks and advantages. More ambitious is to share this information and to change what people think or how they behave. Aiming to change beliefs or behavior provides specific outcomes for evaluating whether the communication worked. The present study evaluates printed evidence-based materials that impacted medicine and changed beliefs and behaviors. If those evidence-based materials succeeded in replacing

²There are some theories that were excluded from the beginning. We did not want to venture into behavior-change theories or psychological theories, because we have no mean to evaluate the reception of evidence-based materials among the different categories of practitioners or among patients. Besides, a great deal of work is done already in the area and it is all heavily based on psychological theoretical approaches (Michie et al, 2005, 2008, 2011; Gardner, 2010; Grimshaw et al., 2006, 2011, Légaré et al., 2010). Today, there is even a project to apply the suggested psychological constructs to evidence-based materials. For that reason, we eliminated all social theories and theories dealing with the reception of the message, the interpersonal or the organizational environment and the community. We retained only the concepts of theories that could possibly find place in the message alone.

well-established practices, it is possible that they contain communication concepts that enable them to share information about risks in a comprehensible way and contain values that are intellectually measurable by physicians and decision-makers.

In summary, risk communication, theory of social values of Tarde's, plain language, readability, learning motivation, narrative, cultural diversity and usability concepts are the most appropriate to understand printed evidence, because they inform the whole process of creating the content, the visuals and the message, as well as the process of understanding, accepting and adhering to the recommendations of the message. The concepts used in this work could help to uncover the strategy behind the printed education materials and therefore to better understand their impact in changing attitudes and behaviors. Besides, the lack of strategy in printed materials could explain the limited impact of evidence-based materials on changing health care professionals' behaviors.

2.1. Risk Communication

The World Health Organization defines “Risk communication is an interactive process of exchange of information and opinion on risk among risk assessors, risk managers, and other interested parties.” (World Health Organization, 2012). This statement is very similar to definitions of evidence-based medicine as a process of information exchange on risks and benefits of health technologies, among health-care professionals, patients and decision-makers.

Evidence-based medicine is particularly interested in balancing the risks and advantages of health care interventions. Quite often printed evidence is distributed and diffused as stand-alone intervention to promote medical practices or behaviors or as inherent part of health campaigns. The printed evidence and health campaigns objectives and means are the same: it is logical that they adopt the same methods of communication to inform the decision-making process and change therapeutic practices.

Risk communication is based on several theories, such as fear arousal theory, sensation-seeking theory and protection motivation theory. Those theories highlight the psychological factors in the mechanisms of reaction to danger and the individual's perceived efficacy, which depends on a cognitive process of evaluation of the threat. Throughout the years, there have been several theories on the subject; they were summed up by Witte (2000) in a meta-analysis of fear-appeal theories. Witte identified three key independent concepts: fear, perceived threat and perceived efficacy. According to her, fear is a negative valenced emotion, accompanied by a high level of arousal. Perceived threat has two dimensions: susceptibility to the threat (i.e., the degree to which one feels at risk for experiencing the threat) and perceived severity of the threat (i.e., the magnitude of harm expected from the threat). The concept of perceived efficacy has also two dimensions: perceived self-efficacy (beliefs about ability to perform the recommended response) and perceived response efficacy (beliefs on how the recommended response works in averting the threat) (Witte, 2000).

Witte (2000) elaborated the Extended Process Model based on the sum of all fear appraisal theories, and suggested that threat perception generated danger control processes that are cognitive by nature: people evaluate the effectiveness and feasibility of the recommended action before they act. Ruiter & Kok

(2011) developed further those concepts and concluded that perceived response efficacy to the threat depends on the outcome of the coping appraisal. If the recommended action is thought to be effective and feasible, then people formulate intentions to perform it. If the action is thought to be ineffective or impossible, the threat perception will continue and will result in emotional fear arousal. To reduce this unpleasant feeling of fear, people might experience denial or avoidance of the threat.

Fear, according to Rutter (2011), as emotion, should be distinguished from the perception of threat, which appeals to the cognitive processes. Still, the relation between fear and threat is linear: the bigger the threat, the bigger the fear.

In risk communication, fear arousal, or showing the negative consequences of procedures or therapies, was often suggested as a method to raise awareness among patients and health-care professionals, and to change the risk behavior into a health promoting one. Most theories and empirical data suggested that fear is the result of a subjective appraisal of the danger and therefore can motivate an individual to act. Still, fear does not impact all individuals the same way and the recommended action depends on the subjective perceptions of self-efficacy, response efficacy, threat severity and social influence (Rogers & Mewborn, 1976).

Risk communication has three goals: share the information about risks, change the attitude and change the behavior (Fischhoff, 2011). In printed education materials on risks and benefits, those goals coexist. As we will see in the Analysis section, some of the indicators of the concept of risk aim to share the information - numeracy, good presentation of risks and benefits, etc.; some indicators, more subjective,

are related to the inclusion of narrative and cultural dimensions; and some indicators are related to cognition, such as learning motivation and modeling behavior³.

2.2. Value

The theory of social value, according to Gabriel Tarde (1902) was a source of inspiration for Roger's theory of diffusion and adoption of innovations (Roger, 1976), and Katz's theory of the importance of personal networks in the adoption of pharmaceutical innovation (Katz et al., 1957). The three theories appear to complement each other and explain the diffusion of printed evidence materials and the adoption of the recommended behavior.

Tarde introduced several universally applicable concepts, the most important of which were value, innovation and imitation. Tarde sees imitation as a dynamic and selective process during which the imitator modifies the imitated object according to his beliefs, choosing the features to adopt, which leads to innovation. Imitation and innovation are in fact two intertwined processes, essential for disseminating and interpreting information. As Tarde (1902) mentioned, value emerges as a result of the interaction between imitation and innovation. The imitator imitates the action of the person that represents some value for him, which will in turn give him additional value in the eyes of the rest of the people. If we transpose this in the printed evidence, it is clear that printed education materials for health care professionals represent innovation, which therefore has the potential to be imitated and be a source for innovations.

³ There seems to be a moment of fine-tuning during which the change of attitude can trigger a new behavior. This work will not try to evaluate or discuss this moment – it is assessed by numerous psychological theories, models and studies of the physical and social environment.

For Tarde, the implicit “value” of an object that can be imitated is in fact a social construct, reflecting the attention, the beliefs and the desires of people towards an idea, an object or a person. It is the result of a particular process of judgment and collective agreement on what is “valuable” as knowledge, usefulness or beauty (Tarde, 1902). Of course, this implicit value creation involves social turbulence, differences, resistances and confrontations. All of those forces of opposition will in turn modify the underlying value of an object or phenomenon, or create another new value (Tarde, 1902).

Value is a highly psychological dimension and depends on belief and desire. It is quantifiable because it possesses certain intensity. “It (value) is a quality, such as color, that we attribute to things, but that, like color, exists only within us by way of a perfectly subjective truth. It consists in the harmonization of the collective judgments we make concerning the aptitude of objects to be more or less – and by a greater or lesser number or people – believed, desired or enjoyed” (Latour & Lépinay, 2009, p. 9).

This understanding brings into sight the practical means through which the “contagion” from one point to another which Tarde called “rayonnements imitatifs” (imitative rays) in his famous *Les Lois de l'imitation* (Tarde, 1895, p.31). The notion of value extends to all assessments of belief and desire. Economy do not sufficiently quantify all of the valuations, the explanation is in the complex interplay between trust and mistrust, truth and not-truth.

Tarde distinguished two types of measurements: one that captures the real state, and one that forms the social world. The first one is measured by wealth; the second is a social quantity: “Now, a man's glory, no less than his credit, no less than his lineage, is to increase or decrease without changing its nature”

(Latour & Lépinay, 2009, p. 9). This allowed Tarde to introduce the term “valuemeter” to describe all the devices that make visible and readable the social judgments. Rankings, communication, polls, etc., are all means of rendering the social status increasingly subject to the opinion and measures of the members of society. Everything is potentially a number for Tarde, because his “valuemeters” capture, gather, concentrate, extract and simplify weightings that occur in people when they are in contact with the other people that they are attached to or depend upon. The comparison between judgments is important, and so is the system of “valuemeters” which allows us to generalize, rapidly and reflexively. Credit and credibility require methodology, made of connected “valuemeters” into methodological chains that allow us to make more precise the comparison of subjective notions. “How is a man's credit, his fame and his glory, born and how does it grow in all its forms? Why would there not be one that would regulate the appearance, growth, increase or decrease of the popular enthusiasm for this or that man of the royalist loyalty of a people, of its religious faith, of its trust in this or that institution?” (Latour & Lépinay 2009, p. 11). The quantification of glory is as good a measure of wealth as wealth is a measure of faith etc. Tarde shifted the attention towards value as the true measure of things. He considers money as expression of values, no more than a combination of entirely subjective things, beliefs, desires and ideas.

The notion of credit and credibility allowed him to formulate his three broad categories of value: value-truth, value-usefulness and value-beauty. We value ideas, information, scientific knowledge and it's material signs – books and journal articles – as truth and they gave a value-truth; we value goods, power, rights, wealth as useful and they have a value-usefulness, and for us all forms of arts and nature, all things considered socially voluptuous thanks to social education, are beautiful, and have value-beauty.

Those values are engrained in all individuals.

The first thing that physicians and health care professionals will most likely investigate in evidence is its value as truth. The printed education materials aim to change their beliefs and practices, and also their first reaction of disbelief (Fischhoff, 2011). Katz's theory (1957) of the importance of personal networks among physicians highlights the strong relation characterizing the ties that a physician has with his local colleagues. In his trial on the diffusion of innovations among physicians (the introduction of a drug), he showed that physicians who are mentioned by many as knowledgeable on the drug were more consulted. Also, the degree of physician's integration among his local colleagues was strongly and positively related to the date of his first use of the drug. There seems to be a “snowball” process – the more doctors uses the drug, the better the chances are of many people picking up the same practice. Mascia et al. (2011) come up to the same conclusion regarding the diffusion of evidence among physicians. The process of adopting innovations starts with physicians who have the same attitude towards the innovation and who are either in collaborative relationships, or within the same field of specialization and hospital sites, or within similar organizational clinical directorates. Katz (1957) showed that the first network to be operative in the chain of influence is the professional relationship or the friendship network. He pointed that it is precisely in situations, which are subjectively unclear that the social validation of judgment becomes important.

Auvray et al. (2003) completed and developed Katz's theory. She distinguished several categories of doctors, according to their delay to adopt a new technology: pioneers, innovators, precocious majority, late majority and followers. The essential factors for adoption were the identity of the doctor and his

way of practicing, his integration in social networks, the characteristics of the drug and the sources of information. Auvray (2003) suggested that the curb of innovation, or the number of persons adopting the innovation at a given date, could be expressed as an S chart. Her conclusion on the process of adoption is quite similar to the diffusion of innovation according to Tarde (1903) who saw innovation as a progress, slow at the beginning, but which gained speed and consistent acceleration at the middle phase, before going into accelerated decrease and stop.

Auvray (2003), along with Steffensen et al. (1999), found that doctors exercising in groups adopt rapidly the innovation because of the communication in the group, and so do doctors who are well integrated in the medical community and who know the new developments from their colleagues.

The theories of Katz (1957) and Auvray (2003) confirmed and illustrated Tarde's vision on the adoption of imitation through imitation. They show how the printed evidence-based materials could be accepted by physicians and other health care professionals once their value as truth, usefulness or beauty is being ascertained by renowned professional peers. The reputation of those professionals gives an additional value-credit to the printed evidence material that is an innovation of some sort. Through the imitative rays (Tarde, 1895), this innovation is diffused among professionals.

2.3. Plain Language, Usability and Readability

A legitimate question could arise as to the relevance of the plain language criteria. The answer is suggested by a posting on the Cochrane Collaboration site from a researcher, Napoll (2011), in which

she states clearly that most clinicians, policymakers and medical reporters, who read Cochrane collaboration reviews, do not read beyond the plain language summary and the abstract. The fact is worth mentioning, because at the same time we can witness an obvious effort, from the Cochrane Collaboration, to present its findings in a way that is more attractive to users. A proof of that: the plain language summaries are mandatory for all studies presented by the Cochrane Collaboration, and its site has been recently rewarded the first place for plain language. If we add this to the recent research of the US Department of Health and Human Services, Office of Disease Prevention and Health Promotion and of the Centers for Medicare & Medicaid Services to fulfill the requirements of the Plain Language Writing Act of 2010, we can see a clear tendency to align health communication with people's needs.

Medical communication exceeds the comprehension of the average North American. For example, it is estimated that more than 90 million Americans have trouble understanding printed information about how to take medication correctly (Kutner, 2005). In such a context, can we say that evidence-based materials are understood and accepted as well by post-graduate researchers, general practitioners and patients? Or should we regard this communication as reserved to the elite researchers?

Health literacy can be defined as “The ability to access, understand, evaluate and communicate information as a way to promote, maintain and improve health in a variety of settings across the life-course” (Rootman et al. 2008). Low health literacy is associated with treatment misunderstanding, including medication names, indications and instructions. Cultural beliefs, new immigration, level of basic literacy are all factors that have to be taken into consideration while designing health

communication tools, especially in multicultural North-America. In its semiannual 2004 health literacy report, *A Prescription to End Confusion*, the Institute of Medicine of the National Academies recognized that health related knowledge, skills and behavior are primarily shaped by (1) cultural background (2) health system demands, and (3) prior learning opportunities (Nielsen-Bohlman et al., 2004).

Number of studies (Wolf, in Fischhoff et al. 2011) documented that most health information exceeds the comprehension of the average North-American adult. Even in country with such a high rate of absolute access to the Internet, such as Canada, over 40% of adults have basic literacy levels below those needed to optimally participate in civil society (Normal et al., 2006). This results in the problem documented in the past twenty years: most medical and pharmaceutical communication is written and presented in ways that exceed people's comprehension (Rudd et al. 2007; Wolf et al. 2006). The International Adult Literacy and Skills Survey of Statistics Canada (IALSS, 2007) considers Level 3 as the minimum level of proficiency required to meet the demands of modern life, independently and reliably in an industrialized nation. The IALSS estimates that among Canadians aged 16 years and more, 48% (about 12 million) score below Level 3 on the prose and document scales and 55% score below Level 3 on the numeracy scale (Statistics Canada, 2007). It means that people below the intermediate level are unable to answer questions on hypothetical scenarios of taking medications at certain times of day or have trouble correctly reading a health appointment slip. Even people at the intermediate level have trouble understanding health information graphs and calculating health insurance costs (IALSS, 2007).

On another level, in such a context, it is also difficult to evaluate precisely the comprehension that the general practitioner has of evidence based information. In practice, is he reading *New England Journal of Medicine*, *Cochrane Collaboration* reviews or *JAMA*? Or does he prefer to scroll through the

guidelines of Health Canada? We should not forget that evidence-based medicine is a medical branch, using the methods of statistics, engineering and sciences, which makes it very complex for people with only a medical degree. In general, physicians are not trained to do research and filter the most pertinent information (Glassner-Edwards & Rawson, 2010; Rohrbach & al., 2006), nor do they have the desire (Genius et al., 2005) or the time to do so (McKenna et al., 2004; Genius et al., 2005). For that reason, researchers suggested to develop an agreed-on terminology (Borsika & al., 2010) or to give better access to training and resources to physicians (Glassner-Edwards & Rawson, 2010).

Do we have to adopt the view that most medical communication materials can be written well at 6th grade level without scarifying content or style (Newhauser, in Fischhoff et al. 2011). The reading level of scientists is between 14 and 16 grade (postgraduate), based on the SMOG, Flesch Reading Ease, and FRY validated reading tests (Newhauser, 2011). The average American reading level is between 7 and 9 grade. Thus, all readers will be able to appreciate getting information that is written in plain language, in a document well organized and easy to skim, to pick up the main points. Material that is well written and designed is not condescending or oversimplified (Toolkit for Making Written Material Clear and Effective, 2010).

For all those reasons, the concepts of readability, usability (including those of learning motivation as defined by Doak, 1995, in the Suitability Assessment of Materials (SAM), and plain language should be taken into consideration. An evaluation of medical printed evidence materials cannot be complete without those notions, essential for the clear transmission and comprehension of evidence.

3. Literature Review

For the purposes of the analysis, we will establish a clear distinction between concepts and indicators. According to Blais' definition (1993), a concept is an abstract global dimension of reality, encompassing variables as concepts (according to Blais, authors disagree as to the notion of variable and its relation to concept). Concepts are divided into indicators which function as empirical denominators to measure just one dimension of the concept. In the present study, we defined concepts from various theories and subdivided them into dichotomous indicators – presence or absence of the indicator in the studied EBPEM.

The analysis is based on the Evaluation grid, which incorporates several theories and concepts. The first theory is the theory of social values (Tarde, 1902). Here, we retained the concept of value-beauty, with one indicator – esthetic advantage for the patient; the concept of value-usefulness for the physician and the health-care system, defined by the indicators messages saving time, messages saving money, messages promoting health, price or satisfaction promised, does not threat self-image, contributes towards self-efficacy, better organization of the environment and increased easiness of procedures. The concept of value-truth has three indicators: endorsement through use of names of renowned people or organizations, background or experience of the source and endorsement through disclaimer of interests.

The concept of risk, related to the elaboration likelihood model (Patty, 2008; Ruiter & Kok 2010) has several indicators : evocation of urgency, intensity of the subject, clear perception for the risk, rhythm of the intervention; effectiveness of the required response; probability of the depicted event; degree of

threat; visibility; degree of novelty of the EBPEM, robustness of the evidence data, highlighted danger, risks enumerated in order of importance, risks and responses described objectively, standard definitions for the various outcomes, risks and benefits, relative risk reduction, use of constant denominators and timeframes, clear difference between baseline and treatment risks, use of positive and negative frames, Interpretation and symbols to convey the meaning and no less than three messages.

We also selected several concepts from Suitability Assessment of Materials - SAM (Doak et al., 1996), related to readability, usability and suitability. The concepts we defined are: appearance in format and length, with two indicators: use of pictures, special fonts and colors, and up to three pages; graphics, with five indicators: graphic on the cover consistent with the purpose, type of graphics facilitating the understanding, relevance of the graphics, explanations for the lists and charts and captions. The other concepts we selected are layout and typography, with the following indicators : clear layout, short and up to the point paragraphs, sentences and words; clear layout, subtitles, fonts easy to read, text in chunks, use of italics and capitals; plain language, with the following indicators – reading level according to the literacy of the audience, active voice, limited use of medical jargon, content given first and learning aids via road « signs »; and the concept of content, subdivided in clear purpose, limited scope, summary or review included and information limited to key ideas indicators.

The last concept from SAM is learning stimulation and motivation. The indicators for the concepts are: behaviors explained or modeled, parallel between experience, logic and language of readers, cultural diversity taken into account and narrative.

3.1. Risk Communication

In the following section, we will operationalize the concept of risk into several indicators, as detailed below.

3.1.1. Indicators to Share the Information in an Objective Way

How can printed evidence share best the information with users and what are the most important factors to be taken into account? In order to answer that question, we should consider human factors. Quite often, people assume that the other knows. As a result, they fail to say important things, expecting others to know them already. The easiest example to show that is hand washing. For years, health workers presumed that people was washing their hands and knew how to do it – it is so simple. But apparently, this assumption was reevaluated and there are now hand washing instructions in all the public restrooms, with pictures and in colors. Similarly, a surgeon might assume that patients know that he is tired after a long surgery, but this is the last thing that comes to mind to the operated patient.

Huntley-Fenner (2011) noted that researchers sometimes fall prey to this bias when they accuse people of attitude-behavior inconsistency, when people's attitudes (e.g., healthy living is important) do not predict their behavior (e.g., diet, exercise) or when they do not understand content: animal content, for instance, might or might not include fish, cheese, or honey. So, however risk is defined, its expected size must be expressed in some statistical terms and risks should be described objectively - some perspectives are valued over others. For example, McNeil et al. (1978) observed that lung cancer patients who had surgery rather than radiation had a better survival rate five years after the operation than two years after the operation – the procedure was difficult and risky, extending the dangerous post-

operative period to two years. But cancer removal was more effective after operation and survivors had a better chance to live longer. In reality, reporting survival statistics for just one period: middle term survival (after the operation) and the long term (five years after the diagnosis of cancer, and three years after the operation) present an incomplete picture to the patient.

As we see, it is important to provide objective and standard definitions for risks and benefits. As Salmon (2005) mentioned, in conveying an incentive appeal, it is often necessary to provide evidence supporting the claim made in the message. Sophisticated and highly involved individuals are more influenced by messages with evidence in form of statistics, documentation and expert analysis. Less involved audience is more influenced by evidence with narratives or dramatized case examples and testimonials (Salmon et al., 2005). As for researcher, they should pay attention and not make extreme claims or present highly biased information, because this may strain credulity and be challenged by critics. That's why it is essential to provide all the evidence, the risks and the advantages, but to do it in a way that will trigger a cognitive evaluation of the data towards the desired change.

Fear appraisal and behavioral compliance can be impeded by a variety of disadvantages perceived by the audience, such as obstacles, drawbacks and forsaken alternatives. Salmon (2005) distinguished two types of messages that can find place in a printed document: one-sided message – presenting only the desired behavior and ignoring the opposite one, and two-sided message – the elements of the opposing case are strategically raised and discounted in order to counteract future challenges. Salmon (2005) considered also that the public has to have a predisposition against the position being advanced as opposing case, they have to be wary of a manipulative intent and aware of the arguments they are to

hear. Patients have to know the risks and the benefits of a treatment in order to make an informed decision. Let us take for instance, the consent for carotid endarterectomy (Fischhoff, 2011), which reduces stroke in some cases. The risks of the surgery are death, stroke, facial paralysis, broken teeth, lung damage and myocardial infraction. Knowing these risks would dissuade at least 20% of the patients.

We should not forget that when affected by emotions or stress, people have difficulty understanding correctly the message. Warnings are often ignored, and they backfire, with the audience doing exactly the opposite of the behavior change (Argo, 2004). Promotional materials increase sales by conveying positive affect; they show happy, successful patients, not those who are suffering. As a result, they likely increase perceptions of those benefits and decrease perceptions of risks. So the first step in a written evidence-based material is to give a clear perception of the risks, the costs and the benefits in a way that people can construct stable and informed preferences and decisions.

Objectivity goes hand in hand with standard definitions. The first step in that aspect is to define risks, costs, and benefits in ways that allow people to construct stable, informed preferences (Fischhoff, 2011). They are essential for risks with multiple outcomes, for risks with multiple features and for outcomes that occur over time. At times, people know so little that they must rely on experts to identify the outcomes that might matter to them, so it is up to the experts to identify and quantify the risks and benefits that matter to users. Fischhoff (2011) advised to go further and to use complete perspectives with standard definitions. For instance, a food box will be comprehensible for most readers if the percentages and the weight of every ingredient are indicated the same way. When cancer patient have to

take important decisions on the treatment course, the doctor should describe the risks and advantages of all options, for the same time period, with the same measures for quality of life, impairment, stay in hospital, gravity of treatment etc. This is the only way that to present options in an objective way so that the person can make a reasonable choice. The perspectives presented should be complete in order not to bias choices (Andrews, 2011; Kees et al, 2010; Hammond, 2009).

Keeping constant denominators for comparisons makes it easier for people to understand. A good practice is to choose a single denominator (e.g., 1 in 10,000, 337 in 10,000), especially whole numbers (e.g., 1 in 10,000) rather than fractions or decimals (.01 in 100) (Sheridan, 1993; Peters, 2009). This applies to timeframes too: when presenting risks and benefits, they should be expressed with the same timeframes to really show the results during certain duration. A very visual aid is to use pictographs and graphs to make numeric information easier to understand (Fagerlin, 2011; vonWinterfeldt, 1986).

All of this makes clear the differences between baseline and treatment risks and benefits (Fischhoff, 2011). In order to do that, it is important to provide arguments and explain all the aspects of the situation, and do it according to the audience.

Also, less is more, in terms of medical information (Peters, 2011). In three studies, Peters tested whether providing less information rather than more, could result in the best outcomes. These studies showed that less cognitive effort in hospital quality reports resulted in better decision quality choices. The same effect was demonstrated with an online tool designed to help oncologists communicate patient benefits from receiving hormonal therapy and chemotherapy. Zikmund-Fisher (2007) found that when fewer

options are presented, knowledge and speed of processing increased significantly. So to make people understand better, it is good to reduce the amount of information shown as much as possible – health educators and physicians often provide patient with too much information, and patients do not always know where to focus their attention and what information should be most important in their decisions. Thus, it is critical that providers of medical information think carefully about which information is crucial and exclude non-critical information.

Speaking about numbers, we should mention that there is a difference between absolute and relative risk reduction approach. For example, when explaining the benefits of chemoprevention to prevent breast cancer, 50% risk reduction could be described as relative; while for instance a reduction in breast risk cancer from a 6% risk of breast cancer to 3%. Many researchers advice against the use of absolute risk reduction, because once this format is used, the percentage of risk reduction seems larger and treatments are viewed more favorably than when the same information is presented in relative risk format.

(Malenka et al., 1993; Baron, 1997).

Fagerlin (2011) went further in defining the importance of numeracy to make information usable and comprehensible. She suggested using numeric likelihoods for risks and benefits, especially when patients are in distress that decreases their ability to process information. Objective measures of numeracy provide the best estimations. A weakness of such measures requires extra time and not only it reduces the usefulness of estimates, but it also frustrates people. This finding corresponds to that of Salmon et al., (2005) who suggested that individuals with better numeracy skills comprehend better health information and tend to remember and use quantitative information more in their judgments and

decisions. Less numerate individuals, on the other hand, appear more likely to weigh and use non-quantitative information, such as narratives, and their own mood states, to inform their decision-making. As printed education materials, in the most cases, targets physicians who are high numeracy individuals, paying attention to numeracy is essential.

3.1.2. Indicators to Change the Attitude

The present subsection explains several factors that should be considered in printed evidence in order to change people's attitude. Those factors will add the necessary personal or emotional touch to convince people or at least, incline the balance in the direction of recommended behavior.

The degree of novelty is the first important factor that may increase the perception of risk according to Bandura (2001). Murphy et al. (1998) also assessed the impact of information on panelists and speakers and found a correlation between the reported novelty of the information and the extent of opinion change. The same factor was evaluated by Ajzen (1972) but more in terms of innovation that brings new perspective, and that may represent an innovation in terms of usefulness, as defined by Tarde (1902). Ajzen (1972) saw novelty as important aspect of argument's effectiveness. Novel arguments are more persuasive and new threats are more impressive. Murphy (1998) also noted correlation between novelty of the threat and degree of opinion change. Novelty is also a form of usefulness, because it brings a new perspective and represents innovation of a sort. Evidence that can be imitated and then shown, as innovation in health-care practice will add an aura of additional prestige to the physician and to the organization. A hospital with a new MRI scanner will attract more referrals and patients, which will generate money and prestige. A new form of treatment, such as laser surgery for the sight, will boost the

health organization's prestige. Imitation of a treatment can be considered a premiere in a particular region, and it will generate followers at its turn.

Risk messages evoke urgency in order to provoke a reaction. Research suggests a positive linear relationship between stronger fear-arousing conditions and greater message acceptance (Berkowitz, 1962; Sutton, 1980). In a meta-analysis of over hundred fear appeal articles, Witte and Allen (2002) conclude "the stronger the fear aroused by a fear appeal, the more persuasive it is" (p. 601).

Visibility of the threat is also important. We are all witnessing campaigns for massive vaccinations against the H1N1, even though in percentages the risk of catching up this type of flu is not great. We all see how some "celebrity" diseases always take the first page of medias – AIDS, cancer, and cardiovascular diseases. When the subject of the evidence is a life-saving issue, or a widely discussed topic, it will attract more attention. Celebrity diseases are one of those examples: Ronald Reagan's Alzheimer and Michael J. Fox's Parkinson were all over the medias and they raised awareness and funds across all North America.

From a reader's perspective, people who are confident in their ability to perform a recommended action (high self-efficacy) and who believe that a recommended action will be effective are more likely to respond to messages about health threats. It is a matter of perceived response efficacy (i.e., the belief that the recommended response works in reducing the perceived threat) (Witte, 2000). High response efficacy is heightened by the probability of happening of the event and by its gravity. If the doctor is aware that he will, in 60% of the cases, diminish the damages of cardiac infarction by giving 1000 mg of

Aspirin on the spot, he will do it without a second thought. The decision will be quick, sure and efficient, without a second of hesitation.

Positive and negative frames are important (Ruiter, 2011, Salmon et al., 2005). People, particularly those who are less numerate, are unduly influenced by treatment described in positive instead of negative terms (e.g., survival rates versus mortality rates). For instance, “60% of men who have surgery to treat their prostate cancer will be impotent. This means that 40% of men will not experience impotence.” (Fagerlin, 2011, p. 186). Gain frames emphasize the positive effects of the behavior or the treatment, whereas a loss frame highlights the disadvantages of performing the behavior. An example: if we say that missing a Pap test can cost you your life (negative frame), we may also say that getting a Pap test will allow you to see your grandchildren grow (positive frame). Ruiter (2011) recommended using a gain frame because meta-analyses have revealed that gain-framed messages are more likely to prevent potential maladaptive responses and are more readily accepted by receivers. Fagerlin (2011) extended the understanding and demonstrates that negative frames are more effective when dealing with uncertainty and risk (for instance, waiting the results of a mammogram), while positive frames are more effective in situations where the outcomes are certain (using car seats decreases injuries in children). Rather than exhorting people to act in a certain way, it is preferable to present the message content that links the desired behavior to valued attributes (Tarde, 1902) and consequences that serve as positive incentives.

To be effective, risk messages should also have some affective meaning, such as connotation of certainty, making the evidence intervention tone vibrant, commanding or intense. In other words, if the

writer is convinced of the usefulness of the evidence, it will show in his writing tone – it will be more passionate, which will translate in the choice of words, adjectives, and arguments. Research suggests that, when provided information that does not convey affective meaning, consumers are unable to use it (Peters, 2011). The use of evaluative labels (excellent, fair) or symbols can help consumers to access the meaning of important information and thereby use it in place of less relevant sources of information (Peters et al., 2009). When the author is himself convinced of the appropriateness of the evidence, when he knows each step of the procedure to follow, the reader feels it.

3.2. Narrative

In order to increase affective meaning, narrative and cultural characteristics elements are often embedded and linked together in the printed evidence, aiming the same thing – change the attitude.

Every written material has some “color” that reflects to some extent the beliefs of the social group of the authors or their background. The color and power of the narrative content varies, resulting from the ongoing negotiations within societal groups and representing the ideological concerns and conflicts of a culture (Harter, Japp & Beck, 2005). For instance, printed evidence, even though it integrates the best data, clinical expertise and patient values, may be viewed with suspicion by patients for whom the term “evidence-based” is already the expression of a dominant mode of scientific thinking, a master narrative, as points out Meyer (2011). She calls it “rationing,” or “socialized medicine.” To consider all the possible points of view that a narrative can take, Meyer takes the example of breast cancer patients who were given doses of chemotherapy high enough to kill them (and hopefully eradicate the cancer), before being rescued by their own previously donated bone marrow or stem cells. This toxic treatment,

unproven by randomized studies, was highly acclaimed by the medical circles. A part of the explanation lies in the warlike metaphors in the media: cancer, the devious invader, is fought with the strongest weapon. Often described as “brave warriors,” those with the disease either “emerge victorious,” or they die, having “lost their battles”. Myths and metaphors surround certain diseases, especially cancer and AIDS. This adds greatly to the suffering of patients, prevents them to seek adequate and timely treatment and prevents them to see the disease as what it is, just a disease, and not a curse, a punishment or an embarrassment (Sontag, 2001).

People make sense of their environment through narratives, to the point that they identify with them, as suggests the construct of Morris (2001), “Thinking with stories”. In making decisions about treatment, patients are encumbered by their own history and memories. If patient witnesses a relative suffer from chemotherapy as a child, he will be traumatized by the memory. Only after seeing and communicating with other patients who tolerated chemotherapy well, he will be able to see the benefits of it. In fact, people understand the words through their experience and their live stories.

3.3. Cultural Diversity

Giving color to a printed material can take also a literal sense, if we think of race and cultural diversity. Different cultures have different values and understanding of health, sickness and treatment. Geist-Martin et al. (2003) discussed the case study of AIDS, disease with five layers of cultural meaning according to them. The first ideological layer of meaning will be a societal one: AIDS is a stigma because it is a bearer's responsibility, it is associated with degenerative condition is contagious and

perceived as ugly, repelling. The sociopolitical layer of meaning explores the politics surrounding AIDS – how the disease is discussed, how are resources allocated and who are the risk groups. And this factor without doubt influences the institutional and professional layer which focuses on the meanings about AIDS that are held and communicated by health care organizations, governments and individuals in professions such as medicine, nursing and social services. Here AIDS is viewed solely as a biomedical phenomenon and patients are seen as victims. The fourth layer is the ethno cultural and familiar layer of meaning of AIDS as it derives from cultural traditions, customs, rituals and social interactions inculcated through the family that influences the perception of AIDS. The interpersonal layer of meaning focuses on the dynamics of style, intimacy, emotion and roles played in human interactions surrounding AIDS.

Witte et al. (1995) pointed to another aspect of cultural communication that writers have to be aware of. The cultural distance between practitioners and patients increases and communication becomes more difficult due to different definitions for verbal and non- verbal messages. The outcomes are misunderstanding, misconception and poorer healthcare. Besides, remarked Witte, great healers know how to motivate patients, they frame messages in a way that achieves acceptance and adherence, and quite often they do that in light of the cultural meaning.

3.4. Concepts Operationalized According to Tarde's Theory of Social Value

Every printed evidence material has an intrinsic value resulting from the importance of its scientific content, and a subjective value, given by the particular practitioner. The scientific value of the knowledge content, in terms of robustness of evidence data, can be measured by normalized standards,

such as those of the GRADE taxonomy⁴ or the CONSORT 2010 checklist of information to include when reporting a randomized trial (Moher et al., 2010). It requires that the clinical based trials have an abstract or a structured summary of trial design, methods, results and conclusions, along with an introduction that gives some scientific rationale for the study. The Methods section should describe the trial design and establish clear eligibility criteria for the participants, the settings and the location of the data. The outcomes should be defined, specified and give the results for each primary and secondary outcome and for each group.

“Valeur-crédit”, as seen by Tarde (1890), is the concept underlying value-truth. It is connected to the expertise, knowledge and renown of the source of the evidence. It refers to the social credit of a person or an object. Glory for Tarde (1890) is a good for the person who possesses it, in military, intellectual or nobility sense, and it is enlightenment for society. This notion is very similar to credibility, and credibility is the factor that affects most audience (Brown, 2011; Gass, 2010). A similar concept was described by Atkin (2004). For him, the messenger who delivers information, demonstrates behavior or gives a testimony should be credible. Atkin provided an elaborate description of the key dimensions of this type of messenger: expertise and trustworthiness are essential; likeability and similarity to the target audience contribute to the attractiveness. The messenger has also a power dimension – he has some form of control over rewards and punishments – and this dimension is important to persuade the others. Salmon (2005), distinguished eight types of messengers: celebrities, public officials, expert specialists,

⁴ GRADE (<http://www.gradeworkinggroup.org/>) stands for Grading of Recommendations Assessment, Development and Evaluation. To achieve transparency and simplicity, the GRADE system classifies the quality of evidence in one of four levels—high, moderate, low, and very low. Evidence based on randomized controlled trials begins as high quality evidence, but the confidence in the evidence may be decreased for several reasons, including: study limitations; inconsistency of results; indirectness of evidence; imprecision or reporting bias. Although observational studies (for example, cohort and case-control studies) start with a “low quality” rating, grading upwards may be warranted if the magnitude of the treatment effect is very large (such as severe hip osteoarthritis and hip replacement), if there is evidence of a dose-response relation or if all plausible biases would decrease the magnitude of an apparent treatment effect.

organization leaders, performers, specially experienced persons, unique characters and real persons (blue-collar man or middle-class woman). This further confirms Tarde's theory (1890) and allows us to suggest that, in the case of printed materials, value-credit can be represented in form of endorsement through use of famous experts or public figures, whose background; experience will add a value to the document (Trade, 1902). As we can see in evidence materials issued by medical authorities, the expertise dimension has an added value through endorsement of a recommended behavior, whether it is endorsement through disclaimer of interests, or through endorsement by important official institutions. The expertise dimension will enhance response efficacy. One example is the warnings for tobacco endorsed by the government. They are official proof that tobacco is bad. A disclaimer of interests will add an extra-value to the document, because it will prove the objectivity of the source. Tarde (1902) mentioned another important value: value-usefulness. A person or an object is useful if they can be viewed as advantageous in terms of goods, power, rights or wealth. The value of a useful object is directly proportional to the number of people who desire it, in a given society and at a given time. It depends also on the power of those people and of the intensity of their desire to acquire the object. If we transpose this to the printed evidence, we will see that the value-utility of the evidence can be expressed as money, time or empowerment. In our modern world, this means time. So the printed evidence will have more value-usefulness if it allows saving time. In medicine, every second can be crucial for saving a life in emergency situations. On the other side, quite often doctors are pushed to the limits by administrative rules to do more in less time.

Health is the most important indicators of usefulness for the physician; a printed evidence material that promotes health will increase the professional utility of the doctor, and give him the satisfaction to see his mission accomplished.

Cost-effectiveness is an important component of evidence-based practice (Brownson et al. 2009). It can provide information to help assess the relative value of alternative expenditures in public health programs. Often, the economic investment of an intervention is compared to the health impacts, such as lives saved or diseases prevented. Quick-references often cite comparative costs of drugs in order to influence physicians. The reason is that money becomes essential for obvious reasons: modern medicine can do more, but its costs are escalating; which is straining the health-care systems especially in the context of a global financial crisis. And, in poor countries, money is scarce even for the most essential procedures or vaccination, while in developed countries; the healthcare needs of an aging population demand more and more resources. So, evidence will have much more value if it simplifies a procedure, or allows the physician to choose cheaper drugs.

According to Tarde (1902) the usefulness of evidence can be measured also in more self-efficacy or right and power. When a young general practitioner receives a short guideline about the different ways to treat and control asthma, which is a complicated disease, it will save him or her much hesitation in dealing with patients with complex conditions. It will give him, or her, a sort of empowerment, because he will be able to point to the right medicine, the right dosage in a second, without hesitation. He will feel this self-efficacy and it will encourage him to do more complex procedures. As Grol (2004) and Michie et al. (2005) pointed out, lack of self-efficacy is one of the barriers to adopt the recommended behavior.

Michie defines self-efficacy as control of behavior, material and social environment, perceived competence, perceived behavioral control, self-esteem, self-confidence or professional confidence. As a result, if the printed evidence contributes to the self-efficacy of the physician, it will have more impact and be useful.

The opposite is also true, if the evidence threatens the self-image of a physician, it will be damaging for his self-esteem and therefore for his self-efficacy. Let us take for instance, guidelines to manage depression in primary care. The document will point to the dangers of not recognizing acute depression leading to suicide, and it might highlight the lack of psychological education of doctors and therefore their incapacity to take charge of the patients. This document will result in physicians distancing themselves from depression diagnostic and treatment – they will of course prescribe the medication, and kindly send the patient to a psychologist. But they will not take charge of the case.

We should also consider is the organization and health of the environment as they relate to the patient. Let us take for instance the case of depression treatment – it is known that the treatment of mild or severe depression depends on the emotional, social and economic context of the patient (Effective Health Care, 1993). The importance of structured social framework for depressed people is enormous in terms of stability and consistency in work, at home etc. This is an example of better organization of the environment, better structure and human quality side of life.

Another concept of Tarde (1902) deserves attention: the concept of value-beauty. The beauty that something acquires is directly proportional of the number of people who like it, of their social taste,

culture, and of the intensity of the pleasure they take in that beauty. Value-beauty can be understood as health, preservation of natural human physical and psychological features as a whole. Health is beauty, and it is visual. Healthy skin has a special glow, the eyes of a healthy person sparkle... this is all beauty. So it can be deduced that value-beauty is not only procedure enhancing the esthetical appearance, such as cosmetic procedure or bionic members, but also a therapy that avoids unnecessary surgical interventions and undesirable side effects of treatments such as baldness from chemotherapy, or swollenness from corticoid use.

As we see in the previous examples, the concept of value is very pertinent to health communication. It has never been examined before in this light, but it has a lot to add to our understanding of all the mental processes leading to a decision.

3.5. Plain Language, Usability and Readability Operationalized Concepts

Federal Plain Language Guidelines (2011) and Toolkit for Making Written Material Clear and Effective (2010) offered several recommendations related to the plain language. One of the first requirements to mention is the active voice, as direct and logical progression from subject performing the action, to verb, to object. Sentences with this direct flow are easy to read, and they encourage people to keep reading.

Another indicator of the plain language requirements is the limited use of medical jargon. Quite often, due to the complex norms of academic research, evidence-based materials use too much medical jargon and technical details, making the readers rapidly bored or confused (Fagerlin, 2011; Fischhoff, 2011). In a lot of cases, practitioners have to rely on their intuition, unproven accounts of best practices, or

popular psychological research (Newhauser et al., in Fischhoff et al., 2011). Newhauser, along with Doak (1995, 2008) recommended limited use of medical jargon, and replacing complex terms with simpler equivalents. Terms should be easy to understand, and simple, so that the reading is easy and fast.

All the above-mentioned documents stressed the importance of using short sentences and short words. The explanation is that for less-skilled readers, a range of about eight to fifteen words per sentence typically works well. Short sentences can convey better complex information, because they break up the information into smaller, easier-to-process and easier to manage units. Every idea can be the subject of a sentence. The easier it is for the audience to get through the recommendation of the evidence-based data, the more likely it is they will comply with its requirements (US Federal Plain Language Guidelines, 2011; Newhauser et al. 2011). Key messages are important to lead the reader, whatever his level of education. Individuals are not likely to sort through long complicated messages to find the key health messages.

Special attention in all communication policies is given to the graphics and the layout. Illustrations, photographs and clip art say more than tables or charts, which target a more educated audience (Newhauser et al., 2011). Graphics consistent with the purpose should “show only the behaviors you want to encourage.” (US Department of Health and Human Services, Centers for Medicare & Medicaid Services, 2010). For example, if the text is explaining health care beneficiary rights and responsibilities, a picture of an older person reading a flyer is better than a picture of an older couple walking hand in hand on the beach. Also, images should be culturally appropriate and show people, activities, and settings that reflect lives of readers. As Doak et al. (1996) pointed out, visuals with captions reinforce

the message – the brevity and position of the caption right near an image highlight the meaning of the image. The recommendations of the Communication Policy of the Government of Canada (2004) and the US Federal Plain Language Guidelines (2011) were similar. The layout should be easy to follow, with uncluttered text. Clean, crisp layout encourages readers by making the material look as if it's going to be easy to read. The paragraphs should express one idea; they should be short and up to the point.

The Toolkit for Making Written Material Clear and Effective (2010), and Newhauser (2011) insist on the importance to create learning aids that act like road signs for the reader. The design should fit the reader's natural and deeply ingrained way of progressing through a printed page, so that headings, text, and images guide him smoothly through the material without diverting or distracting him.

Those documents pay special attention to the font size itself, recommending at least 12 points serif for the printed materials. When a font is highly readable, it doesn't attract attention to itself, it is almost as if it is invisible. This lets the reader focus entirely on the meaning of what he is reading. Opinion shared by Wheildon (2005), who recommended using font size between 12 and 14 points, so that older people and people who have trouble seeing read with ease. He does not recommend using script or fancy lettering.

Newhauser (2011) evaluated the readability of a text also in terms of formal content, which is consistent the requirements of the Toolkit for Making Written Material Clear and Effective (2010). She highlighted the importance of giving the context first, at the beginning of the text and, throughout, if possible. This could help readers understand the new information and remember its meaning – many readers of health information don't use a glossary, especially those with poor literacy skills.

Also, the scope of the document should be limited to the relevant information and directly related to the stated purpose. It also means that title should correspond to the content, and the content to the issues raised and discussed. Doak (1995, 2008), in his Suitability Assessment Materials – SAM) and in his guidelines for writing materials for Pfizer, suggested also including a summary of a review to highlight up and explain the most essential points, as well as content about the precise behavior to adopt, modeling good practices and suggesting appropriate approaches for the cases.

As of course, access to message content requires effective document design, which involves addressing the technical issues, readability, graphics and layout, we incorporated some elements from the SAM test (Suitability Assessment of Materials), a tool created by Cecilia and Leonard Doak, to assess readability, usability and suitability elements (Newhauser, 2011). And also some indicators related to the concepts of plain language as described by the US Department of Health and Human Services, Centers for Medicare & Medicaid Services (2010) and the US Department of Health and Human Services, Centers for Disease Control and Prevention (2006). In our view, those are just the first steps in normalizing the difficult language of medical literature in general.

3.6. Mapping Approach Literature

The literature presented in the previous section will be useful in establishing a grid to evaluate printed evidence. This evaluation grid, through “mapping” approach will be applied to printed materials to map the concepts and indicators, which might contribute to the effectiveness of a printed intervention in evidence-based medicine. The “mapping” approach is a relatively new method to apply various theoretical concepts to interventions in order to categorize those interventions.

In an attempt to understand the reasons for the gap between implementation and research, several researchers (Glasgow et al., 2007, Green et al., 2009) proposed a theoretical framework to be applied to printed evidence-based materials. They were classifying the documents from the point of view of behavior-change, which is insufficient to prove their effectiveness without large-scale surveys among physicians. Besides, this approach was suggested only in meta-analytical studies, and it was not applied on “real” printed evidence that was distributed to physicians. It remains valid as an attempt to theorize and categorize evidence-based materials.

Another important paper in the field was making psychological theory useful for implementing evidence-based practice: a consensus approach (Michie et al., 2005). The researchers came to the conclusion that evidence-based guidelines are not implemented effectively, due to a lack of theoretical understanding of the processes involved in changing the behavior of healthcare professionals. After a consensus on the elaboration of a theoretical framework on psychological theories, they agreed on set of key theoretical constructs (defined as component part of theories), to study the effective implementation of evidence-based practice. The most important achievement of this study was that it stated the need for theoretical basis in understanding the failure of evidence implementation. This research did not limit itself to one theory and was based on different concepts from different theories. Unfortunately, until now, this framework has not been tested on evidence-based interventions.

Another taxonomy, established by Lowe (2011), is based on evidence material targeting consumers. It aimed to provide for the lack of standardized language and overarching framework in interventions and

to identify, describe and organize interventions. A similar work by Walter et al. (2003) categorized a variety of initiatives and practices to enhance the impact of research on public sector policy and practice. The particular strength of his categorization lied in its conceptual and theoretical value to plan and select appropriate strategies for encouraging evidence-informed policy or practice. Another study entitled An Intervention Mapping Approach (Bartholomew et al., 2011) recognized that there are necessary steps for intervention mapping using behavior-oriented theories in health promotion.

In the same vein, Michie et al. (2011), working with different frameworks of behavior change interventions, developed a wheel of frameworks. The study had the benefits of having been derived from classifications already available and therefore covering concepts that have previously been considered as important. The wheel of framework was using an overarching model of behavior to link interventions to potential behavioral targets.

Gardner et al. (2010) outlined a method for applying theory to evidence syntheses of behavior change interventions. He selected and applied theory to evidence synthesis around interventions draws on recent developments in behavior change techniques (Abraham & Michie, 2008) and statistical methodology. His method consisted of establishing an approach to deconstruct interventions into component techniques, selecting a theory which offers predictions, coding intervention for constructs central to these predictions, and investigating the contribution of these constructs to observed changes in behavior.

All of those approaches proved that classification and analysis of interventions could be directed by theoretical predictions. They also revealed the presence or absence of theoretical coherence of interventions and provided useful information regarding the applicability of the theory across different contexts and populations.

Of course, this method has some limitations. The first one is that the theoretical approach cannot explain the differences in the effectiveness, differences that may come from variations of the intervention delivery, compliance to protocol or various responses among intervention recipients. Another limitation, as pointed out by Gardner (2010) is that using only one theory as a basis for understanding behavior-change interventions can limit the understanding of interventions. Alternative theories might be useful and enhance evidence synthesis, especially constructing integrative frameworks, which combine multiple theoretical perspectives (see Rotheram-Borus, Ingram, Swendeman, & Flannery, 2009).

As mentioned before, those methodological researches were based on theoretical constructs but they were never applied to first level real evidence, as it is distributed to physicians. It is necessary to do that to prove their validity.

4. Methodology

The present chapter will describe the study population and the sampling criteria for choosing the EBPEM. Effectiveness is assessed for each EBPEM in terms of real-life behavior change provoked among physicians. The changes are described and assessed by printed meta-analyses, which are in turn validated by the Cochrane Collaboration.

In the following section, we will also introduce the Evaluation grid, based on the operationalized concepts from the previous section, and the method for testing it independently by two researchers. We will then describe the approach taken to develop an evaluation grid of the communication elements in EBPEMs based on the operationalized concepts from the previous section. Finally, we will present the method for validating and testing the evaluation grid.

4.1. Research Questions

As seen in the previous chapter, the “mapping” approach to evaluate the effectiveness of printed materials was based on psychological and behavioral taxonomies and classifications, which were never applied to the “real-life”, printed evidences distributed to physicians. This was of course, a great contribution to the understanding of evidence-based uptake and knowledge transfer. Still, in our view, three elements were a bit neglected in the process.

First, what is the part of communication in those theoretical approaches? There is no communication systematic evaluation of printed evidence, taking into account all the concepts that are relevant to health

communication and that can be applied to the evidence.

Second, in the process of creating evidence, there are three stages. The first is the collection of data, the research following specific ethical, methodological and deontological guidelines, the choice of disease-specific elements and the elaboration of the message from a scientific point of view. The message, the printed evidence material itself, is then diffused among physicians with the certainty that they will be able to grasp in a glance all the subtleties and details. We should not forget that those messages contain medical data, and also elements from engineering, logistics, and statistics etc. - all subjects that are not included in medical information. The doctors will probably be unable to assimilate, classify and use the totality of that mathematical data.

At the other end of the spectrum, researchers (Gagnon, 2005; Farmer, 2008; Michie, 2005, 2008, 2011) focused on the reception of the message, the psychological factors to change the intention (Ajzen, 2010; Bandura, 1997) or the behavior, the planned action, the physical and societal environment.

The message containing the evidence is an entity by itself. It has its own structure, appearance and personality in terms of style, choice of arguments and hierarchy of risks and benefits, context effects, etc. But these aspects of the message are only partially touched from the different points of view of research. At the other end of the spectrum, researchers (Gagnon, 2005; Farmer, 2008; Michie, 2005, 2008, 2011) focused on the reception of the message, the psychological factors to change the intention (Ajzen, 2010; Bandura, 1997) or the behavior, the planned action, the physical and societal environment.

As a result, there are three unknowns in the uptake of printed material evidence that deserve research: the place of communication concepts in all the research done until now on evidence uptake, the message itself as an independent vehicle of evidence that is communicated, and the real documents of printed evidence that were not really looked upon.

The sampling in the present work will be based on printed evidences that had proven their efficiency, as defined by Farmer et al. (Cochrane review). It consists of printed materials, informed by scientific evidence and distributed to health care professionals. They represent a field that can be rich with communication elements. Those elements have certainly contributed to the efficiency. This will be the reality of printed evidence material that will help us answer the following questions:

RQ1. What are the indicators characterizing both the content and the format of PEM?

RQ2. What are the most frequent communication concepts and indicators showing strategic intent that could contribute to higher impact or relevance of printed evidence materials?

RQ3. What are the communication concepts or indicators missing in printed evidence materials that eventually could be included to improve their overall impact?

4.2. Sampling Criteria

This section explains the selection criteria for the material being analyzed. In our view, successful printed evidence is the richest source of successful communication techniques, because its success might not only be based on scientific merit, but also on some other advantages inherent to their presentation, content, form or communication elements.

According to medical evidence researchers (Farmer et al., 2008; Michie et al., 2005, 2008, and 2011), the gold standard and the best source for effective printed evidence is, the Cochrane Collaboration. In 2008, Farmer et al. (2008) published a systematic review on printed evidence effectiveness, in which they analyzed several studies and investigated the effectiveness of printed educational materials to change professionals' behavior.

An update of Farmer et al. review is ongoing (Giguere et al., forthcoming). We have approached the review team and asked their collaboration to use the EBPEM studies that were included in their updated review. The members of the team communicated with the authors of the highlighted EBPEM and asked them to send in their original studies. Thus, they established a database of 45 EBPEMs, with different format, appearance, distribution and type: randomized controlled trials, controlled clinical trials, controlled before and after studies or interrupted time series analyses. The EBPEMs also pertain to different aspects of the health-care continuum, whether it is the patient's compliance to a drug therapy, the selections and dosing of antibiotics in primary care, the necessity to perform a surgery or new findings that corroborate or refute some practices.

All of the EBPEM defined through those studies have one thing in common: they shaped the world of modern medicine, as we know it. And they are effective evidence, whose effectiveness is evaluated by and based on proven studies and trials.

4.3. Sampling

The following section presents the EBPEM that are defined in the Cochrane Collaboration review

(Légaré et al., 2008) and the forthcoming update, and the EBPEM with proven effectiveness.

The total number of evidence-based materials is 45. We decided to consider all available printed evidence-based education materials, thus providing a sample. There are 23 quick-references and 22 peer-reviewed evidence-based publications, an almost equal distribution of each type of materials, allowing easier comparison between peer-reviewed articles and quick-references.

The effective quick references are those covered in the studies of Weiss (2011), Dormuth (2004) and Zwarenstein (2007). Dormuth mentions 11 printed quick-references, all published in *Therapeutics Letter*. They are concise and colorful 2- to 4-page bulletins with an easy-to-read question-and-answer format that was sent to over 6000 physicians in British Columbia.

Zwarenstein (2007), elaborated a quick reference during his trial described in the Ontario printed educational message (OPEM) trial to narrow the evidence-practice gap with respect to prescribing practices of general and family physicians. His study is a cluster randomized controlled trial, targeting the care of individuals with diabetes and hypertension in Ontario, Canada. The results of the trials are published in *Implementation Science* 2: 37. The quick-reference for physicians is inserted in the paper.

The quick-references mentioned by Weiss (2011) are 11 two-page highly graphic materials providing clinical information (diagnosis, investigation) and antibiotic recommendations. They were published and sent to all Ontario physicians (including medical residents), and pharmacists in January 2005 (<http://www.cdm.gouv.qc.ca/site/aid5166.phtml>). The topics included upper (pharyngitis, otitis media,

sinusitis) and lower (bronchitis, community-acquired pneumonia) respiratory tract infections, urinary tract infections and *C. difficile* infections in adults and children.

In the EBPEM sampled, there were also 6 guidelines presented in the studies by Black (2002); Roberts (2007); Fonarow (2009); (Watson, 2001) and Mason (1998). These studies target respectively cardiac infraction, depression, glue ear, hip prostheses and use of non-steroidal anti-inflammatory drugs (NSAIDs) in the management of musculoskeletal disorders.

The evidence-based peer-reviewed publications are those defined by Austin (2005), Austin (2003) – the famous WHI trial, Bjornson (1990), Hersh (2004) – the HERS and HERS 2 trials; Kabir (2007) - VALUE; Austin (PROVE IT TIMI trial), Jackevicius (2001); Majumbar (2003); LAM (2009); Wang (2005); Fonarow (2009); Shah (2008); Mason (2001); Majumbar (2004); Juurlink (2004) and Haas (2004).

One of the most important trials is the WHI trial (Writing Group for the Women's Health Initiative Investigators, 2002) on the risks and benefits of hormone therapy (HT) in postmenopausal women. Several authors discuss it.

Austin (2004) established a direct link between the increased prescription of clonidine (drug relieving hot flashes) among elderly women in Ontario, Canada and the publication of the WHI trial. Barbaglia et al. (2009) noticed also the influence of this trial on the progressive decrease of hormone therapy in Spain, where hormone prescription decreased by 89.1% in 50- to 54-year-olds. Guay et al. (2005)

confirms the data, stating that the numbers of hormone therapy users declined respectively by 28% and 50% after the publication of WHI. In another publication, Majumdar et al. (2004) notes also that within 9 months of the report's publication (quarter 1 of 2003), there was a 32% decrease in hormone therapy prescriptions.

Along with the WHI trials, two more trials, HERS (Hulley et al., 2004) and HERS II (Grady et al.) deserve evaluation. Haas et al. (2004) compares the huge influence of the WHI trial on the decline of hormone therapy with the modest influence of the HERS, explaining the difference with the publicity surrounding the WHI. Hersh et al. (2004) highlight the hormone therapy prescription's decline after the publication of the WHI, HERS and HERS II trials, decline which was up to amounting 66% in the case of the drug Prempro.

Juurink (2004) study demonstrates that the publication of Randomized Aldactone Evaluation Study (RALES) was associated with an abrupt increase in spironolactone prescriptions, up to 149 per 1000 new prescriptions, from 1999 till late 2001.

The effectiveness of PROVE IT-TIMI 22 (Cannon et al., 2005) and REVERSAL (Nissen et al., 2004) trials are highlighted by Austin (2005) who describes the impact of the publication on the trial prescribing in the case of patients with acute coronary syndromes. The conclusions of these trials changed national and international guidelines.

Another effective EBPEM is the Veterans Administration cooperative trial (Cohn et al., 1986) on

prescribing practices in case of congestive heart failure. Bjornson (1990) interviewed 288 physicians and two-thirds of them were aware of the trial and intended to adopt the recommendations. Mason (2001) notes that the same trial changed surgery trends and avoided 89 800 procedures nationally, a decrease of 30 % of the number of surgeries, for a theoretical saving of £27 milliands in 1992.

Black (2002) highlights the impact of one national guideline on persistent glue ear surgery (Effective Health Care, 1992). It resulted in a 7.9% decrease of the rate of surgery for children less than 10 years of age (Black, 2002).

In his review, Dormuth (2004) highlights the importance of the recommendations in the Therapeutics Letter (1995-1997) which produced prescribing changes by at least 30% in the 3 months after the mailing of the letter.

Fonarow (2009) shows the relationship between the increased utilization of lipid-lowering medications and certain randomized clinical trial evidence (Smith et al., 2006; Braunwald et al., 2002; Schwartz et al., 2001; Cannon et al., 2004) demonstrating improved outcomes in cardiac patients.

Three of the published clinical trials evaluated in the present study - ALLHAT (ALLHAT, 2002), VALUE (Julius et al., 2004) and LIFE (Dahlof, 2002) – changed the way physicians prescribe new AHT. Those trials are mentioned in the study of Kabir (2007) who evaluates their effect and concludes on the little effect of new prescribing patterns in Irish general practice. On the opposite, Stafford (2004) examines the prescribing practices after the April 2000 publication of the ALLHAT trial (ALLHAT,

2000) and notices a steady decrease in beta-blockers prescriptions. Between 1999 and 2002, new annual prescription orders declined by 26% (from 5.15 million to 3.79 million), dispensed prescriptions by 22% (from 17.2 million to 13.4 million), and physicians reported that drug use was reduced by 54% (from 2.26 million to 1.03 million).

The 4D trial (Wanner et al., 2005) is selected by Lam et al. (2009), as one of the largest published randomized controlled trials on the effect of statins in hemodialysis patients, showing the little effect of atorvastatin in preventing cardiovascular events.

The RALES study (Pitt et al. 1999) is mentioned by Majumdar et al. (2003). The study on the effect of spironolactone in heart failure patients was stopped early because a 30% reduction in mortality was observed. But, because of the little promotion of the study, the use of spironolactone increased with only 2% in US and Canada. Majumbar et al. (2003) presents the HOPE study (The Heart Outcomes Prevention Evaluation Study Investigators, 2000), which publication was associated with a substantial increase in prescriptions for ramipril in Canada and the US - it accounted for 30% of all ACE inhibitors prescribed in Canada and for 6% in the United States.

According to Mason (1998), the bulletin on the treatment of depression in primary care (Effective Health Care Bulletin, 5) can be very effective. This EBPEM halted the constant increase in prescribing of SSRI antidepressants, in 1993, and led to an 8.2% fall in prescribing, avoiding 138,000 years in treatment and saving 40 million lyres sterling.

Among the defined EBPEMs is also a highly publicized meta-analysis (Nissen et al., 2007) on the risk of a therapy with rosiglitazone, judged as effective by Shah (2008), who determined that following the release of the meta-analysis, there was a sudden decline in new users of rosiglitazone (mirrored by a nearly identical increase in new users of pioglitazone).

We included also the guidelines highlighted by Wang (2005). He notes that despite the publication of new guidelines in 1998 and 2001 (Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults, 2001), there were just modest improvements in cholesterol management in practice.

In the study by Jackevicius et al. (2001), it was noted that the Scandinavian Simvastatin Survival Study (4S) (Pedersen et al., 1994), lead to 3.6 fold significant increase in the monthly rate of statin use after the publication of this study.

Weiss (2011) highlights the effectiveness of the guidelines that the Quebec Medication Council issued in the fall of 2004, at the request of the Quebec Minister of Health as a first series targeting the most common infectious conditions in the outpatient setting. The highly graphic two paged guidelines were highly publicized and distributed. Their implementation significantly reduced antibiotic prescriptions in Quebec compared with the rest of Canada, and there was a strong trend toward significant cost reduction. We included these guidelines in our evaluation.

The last of the defined material was the OPEM material developed during Zwarenstein et al. (2007) trial.

The researchers tried to evaluate the effectiveness of distributed evidence-based material. To do that, they developed one message with standard methods, whereas a team of psychologists with experience in knowledge implementation developed a second message. The objective of the trial was to determine whether a message based on the psychological theory of planned behavior (Ajzen, 1991) is more effective in changing clinical behavior than a standard message, uninformed by an explicit theoretical basis. We included the two messages in our set of effective EBPEM.

Table 1. Effective EBPEM analyzed in the study.

Category	Study reference	Name of the trial	Topic
Quick-references	Dormuth (2004)	Twelve issues of Therapeutics Initiative	Hyperplasia, anxiety, asthma, post-menopause, sleep, ulcer, dyspepsia, hypertension
	Weiss (2011)	Eleven clinical guides	Asthma, bronchitis, antibiotics, urinary infection, pneumonia, sinusite, tonsilite, otite, colite, bronchite.
	Zwarenstein (2007)	OPEM	Diabetes management
Guidelines	Fonarow (2009)	ACC/AHA 2002 guideline update for the management of patients with unstable angina and non-ST-segment elevation myocardial infarction	Management of angina and non STEMI
	Fonarow (2009)	ACC/AHA Guidelines for the Management of Patients With ST-Elevation Myocardial Infarction - 2004	Management of STEMI
	Mason (1998)	Treatment of depression in primary care	Treatment of depression
	Mason (2001) Black (2002)	Treatment of persistent glue ear in children	Surgical treatment for persistent glue ear
	Roberts (2007)	Selection of Prostheses for Primary Total Hip Replacement	Selection of Prostheses
	Watson (2001)	Development, implementation and evaluation of Prescribing Guidelines In General Practice	
Peer-reviewed publications, trials, articles, newsletters	Austin (2003) Majumdar (2004) Barbaglia (2009)	WHI	Risks and benefits of HT
	Austin (2004) Stafford (2004) Kabir (2007)	ALLHAT	Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial
	Bjornson (1990) Kohn (1988)	Veterans Administration cooperative trial	Vasodilator therapy in congestive heart failure
	Fonarow (2009)	Prove it-Timi 22	Intensive versus Moderate Lipid Lowering with Statins after Acute Coronary Syndromes
	Haas (2004)	Randomized Trial of Estrogen Plus Progestin for Secondary Prevention of Coronary Heart Disease in Postmenopausal Women	

Haas (2004) Hersh (2004)	HERS I	HT for prevention of cardiac infarction
Hersh (2004)	Randomized Trial of Estrogen Plus Progestin for Secondary Prevention of Coronary Heart Disease in Postmenopausal Women	
Hersh (2004)	HERS II	Follow-up on HERS I
Jackevicius (2001)	Scandinavian Simvastatin Survival Study	Cholesterol lowering in coronary patients
Juurink (2004)	RALES	Effect of Spironolactone on patients with heart failure
Kabir (2007)	LIFE	Cardiovascular morbidity and mortality in the Losartan Intervention For Endpoint reduction in hypertension study (LIFE): a randomized trial against atenolol
Kabir (2007)	VALUE	Outcomes in hypertensive patients at high cardiovascular risk treated with regimens based on valsartan or amlodipine: the VALUE randomized trial
Lam (2009)	Atorvastatin in Patients with Type 2 Diabetes Mellitus Undergoing Hemodialysis	Atorvastatin in Patients with Diabetes Mellitus
Majumdar (2003)	Effects of an angiotensin-converting enzyme inhibitor, ramipril, on cardiovascular events in high-risk patients	Effects of ramipril
Shah (2008)	Effect of Rosiglitazone on the Risk of Myocardial Infarction and Death from Cardiovascular Causes	Effect of Rosiglitazone in cardiac diseases
Wang (2005)	ATP III	Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults

4.4. Analytical Approach

Considering the gap between research and practice, only evidence-based materials with proven effectiveness might contain some communication elements that could ensure their success.

Outcomes can take many forms and the most decisive one is behavior-change. Outcome evaluation is the most reliable proof of the success of a printed intervention and it allows a formal evaluation of the factors of success of this intervention (Downs, 2011). In other words, a good formal evaluation of the factors that led to the success of given evidence on the basis of its outcome - its' efficiency in changing behavior. Having in hand material with proven effectiveness, a detailed analytical grid can “map”, or evaluate, the presence or absence of some communication elements in this material. This will allow us to see which communication elements are frequently repeated – this will eventually explain the success of this printed evidence in changing behaviors; which elements, recommended as efficient, are not present

or are randomly present, and which are missing.

In practice, a two-step approach is presented. The first step is the elaboration of an evaluation grid categorizing the relevant communication concepts and indicators. It will be applied to our sample of printed evidence with proven effectiveness. We estimated that the results would be more conclusive if we start with the best samples in the field of evidence, because we will be able to isolate features or concepts that are recurrent and that might have been decisive for the uptake of the data.

The second step is to apply the grid to the defined EBPEM, in order to evaluate the message itself, the active “communication” ingredients of the printed evidence. The objective is to establish a common way to define and describe content components of printed evidence. It will develop and extend existing content components into a set of theory-linked definitions; a comprehensive set that could be applied to every intervention being developed. This grid could also be used to identify specific techniques, differences and similarities in printed evidence. It will also point to elements that could be effective for targeting similar behaviors in similar settings. In addition, such a grid can be the basis for standardized descriptions of content in published evidence and it will enhance replication fidelity.

Two researchers tested independently the presence or absence of the concepts and indicators in the published interventions. They evaluated also the reliability of the identification of the 62 proposed indicators. Disagreements occurred when one coder identified a technique in an intervention description and the other coder judged the technique to be absent. Agreements arose when both coders identified the same technique or judged it to be absent. Cohen’s (1960) kappa statistic was used to assess

interreliability for each of the 62 indicators for one third of the printed evidence materials.

The inter-annotator agreement was judged good to very good (Cohen's kappa coefficient: good agreement = 0.60 to 0.80 and very good agreement = 0.80 to 1.00). The final results were then summed up in a spreadsheet showing the frequency and distribution of each concept. We can therefore conclude that our agreement rate was substantial to outstanding. It was possible to draw some graphs.

4.5. Evaluation Grid

The purpose of the Evaluation grid is to assess the presence or absence of 62 elements, and based on that, assess qualitatively the EBPEM and uncover the strategy behind these materials. The elements included in the grid will be presented with the corresponding numbering, as they appear in the grid.

At the beginning, there is a preliminary distinction (Intended audience of the EBPEM) to be made between evidences as to whether they are peer-reviewed evidence-based publication, full guideline for treatment, procedure or health technology, newsletter or journal or a quick-reference for practitioners. Those elements are not evaluated; they are just here for information.

The following seven elements, related to the appearance of the evidence (1. Appearance): use of pictures, special fonts and colors, as well as length of the evidence – whether it is less than three pages – allow to classify the document at first sight. The next five elements pertain to the use of graphics and captions (2. Graphics): graphic on the cover consistent with the purpose, type of graphics facilitating the understanding (the graphic is self-explanatory and facilitates the understanding of text), relevance of the

graphic as complement to the text, captions and explanations for the lists, the tables etc.).

The layout and typography concept (3. Layout and typography) is evaluated with the presence or absence of the following indicators: clear layout (as visual arrangement of content and graphics on a printed publication (a good layout should organize the information and graphics in order to create a visual path for the reader and attract their attention); short and up to the point paragraphs, short sentences and words (paragraphs of no more than 10 sentences, sentences of up to 12 words, and use of simpler and shorter words); subtitles; font size easy to read (at least 12 points); text in chunks, delimited with clear white space (well divided and allows a clear read); use of italics and capitals (appropriate use of italics and capitals for references, subtitles etc.)

The content concept (4. Content) contains the following indicators: clear purpose (whether the information corresponds to the objectives); limited scope; summary or review and information limited to the key ideas conveyed.

In the section related to the plain language (5. Plain Language), we evaluate the reading level of the document, the use of active voice, medical jargon, and the presence of context and learning aids via road signs (The learning is enhanced by advance organizer, headers or topic captions tell the reader very briefly what is coming next.)

According to Doak et al. (1995) the suitability of materials should represent a motivation for readers and learning stimulation. In the section 6 (Learning stimulation and motivation for readers) are: parallel

between experience, logic and language of readers (they should correspond to the reader's level of education, language and background); behaviors explained and modeled (the document talks about good practices or gives precise indications); cultural diversity and narrative.

The section 7 (Risk: related to the sensation-seeking theory; the elaboration likelihood model) is based on criteria proposed by Patty, 2008; Ruiters & al. 2010; Normal & Boer, 2005. It includes the following elements: evocation of urgency (as medical concerns to be answered immediately); intensity of the topic as life-saving or “hot” topic; clear perception of the risk without ambiguity; vibrant, intense or commanding rhythm of the intervention; effectiveness of the required response from the physician; probability of the depicted event, degree of threat, visibility of the subject, degree of novelty, robustness of the evidence data, highlighted danger; risk enumerated in order of importance; risks described objectively; standard definitions for the various outcomes, risks and benefits, use of constant timeframes, denominators and whole numbers; use of positive frames and interpretation or symbols to convey the meaning.

The sections aiming to assess the presence or absence of value, based on Tarde (1902), are value-truth (8.1. Value-truth), value-usefulness (8.2. Value-usefulness) and value-beauty (8.3. Value-beauty). Value-usefulness for the physician would represent messages saving time, money or promoting health; also messages that promise some kind of price or satisfaction and those that don't threaten self-image and contribute towards self-efficacy.

Value-truth section assesses whether there is endorsement through use of names of renowned

organizations and people or through disclaimer of interest and also if the background or experience of the authors contributes to the notion of value-credit of Tarde (1902). As for the concept of value-beauty, it will be present if the medical technology described enhances the esthetical appearance of the patient or prevents some damage to his integrity.

Table 2. Evaluation Grid

Evaluation Grid Information		
Concepts	Indicators	Comments
Intended audience of the EBPEM	Quick reference for practitioners	
	Newsletter or journal	
	Peer-reviewed evidence-based publication	
	Full guideline for treatment, procedure or health technology	
1. Appearance inl. Use of pictures, special fonts and colors format and length 2. Up to 3 pages		
2. Graphics	3. Graphic on the cover consistent with the purpose	Consistent and self-explanatory.
	4. Type of graphics facilitating the understanding	The graphic (not the table or the list) is self-explanatory and makes it easier to understand the text
	5. Relevance of the graphics	The graphic enhances the understanding of the text.
	6. Explanations for the lists, the tables etc.	
	7. Captions	Use of captions
3. Layout and typography	8. Clear layout	A layout is the visual arrangement or content and graphics on a printed publication. A good layout should organize the information and graphics in order to create a visual path for readers to follow, and attract their attention.
	9. Short and up-to-the point paragraphs. Short sentences and short words	Paragraphs of no more than 10 sentences, sentences of up to 12 words, and use of simpler and shorter synonyms of the normal words.
	10. Subtitles	There are subtitles.
	11. Font size easy to read	It is not excessively small or too big, at least 12 points, serif.

	12. Text in chunks, delimited with clear white space	The text is well divided and allows a clear read.
	13. Use of italics and capitals	Appropriate use of italics and capitals for references, subtitles and also to make the layout more clear.
4. Content	14. Clear purpose	The purpose is clearly stated in the title. The essential information revolves around the key messages, and contains the information relevant to the objectives of the documents.
	15. Limited scope	The scope of the document is limited to the stated purpose. It defines the problem, the rationale and points to a solution.
	16. Summary or review included	There is a summary or a review which sums up and explains the most essential information.
	17. Information limited to key ideas	The document discusses the relevant aspects of the key messages – ideally, the three or four ideas conveyed.
5. Plain language	18. *Reading level according to literacy of the audience	The reading level of scientists is between 14 and 16 grade (post-graduate), based on the SMOG, Flesch Reading Ease, and FRY validated reading tests. The average American reading level is between 7 and 9 grade. Note: For the purpose of this work, we will give a point if, after comparison with other evidence, the material shows an obvious effort to simplify the language.
	19. *Active voice	Sentences are mostly in active voice. Note: For the purpose of this work, we will give a point if, after comparison with other evidence, the material shows an obvious effort to use active voice.
	20. *Limited use of medical jargon	The document is written for the level of the general public and does not use unnecessary medical terminology Note: For the purpose of this work, we will give a point if, after comparison with other evidence, the material shows an obvious effort to limit the use of medical jargon.
	21. Context given first	Context here has two meanings: place the reader in the right circumstances or give a brief abstract in the beginning of the study.
	22. Learning aids via “road signs” in the text	The learning is enhanced by advance organizer, headers or topic captions tell the reader very briefly what is coming next.
	6. Learning stimulation and motivation for readers	23. Behaviors explained or modeled
24. Parallel between experience, logic and language of readers		The EBPEM language, format and logic correspond to the reader’s level of education, language or professional background. Still, we should always assume that it is better to go one level below, in order to include the maximum of readers. PEM

	25. Cultural diversity taken into account	The document is adapted to the cultural needs of users and takes into account their customs, beliefs or mentalities.
	26. Narrative included	The document takes into account the personal perspective of the patient and gives some form of personal testimony.
7. Risk (related to the sensation-seeking theory; the elaboration likelihood model (Patty, 2008; Ruiter & al. 2010; Normal & Boer, 2005)	27. Evocation of urgency	The document raises concerns that have to be answered immediately in order to improve morbidity or mortality of the patients.
	28. Intensity of the subject	The document discusses an important, life-saving topic, or a topic that, for some reason, is on the first page of the news.
	29. Clear perceptions for the risk	The risk is clearly stated and delimited. There are no vague zones and ambiguity (which will lead to distrust pessimism and decision avoidance).
	30. Rhythm of the intervention * Vibrant, intense, commanding	The document is obviously written by a person who is emotionally involved in the subject, or he is driven by the urgency to say something. It's tone is vibrant, intense or commanding.
	31. Effectiveness of the required response	In order to respond to the document, the practitioner has to take clear position or decisive action, which will give concrete and precise results.
	32. Probability of the depicted event	The event described in the intervention has more than 51% chances to happen
	33. Degree of threat of the event	The threat depicted is serious, and cannot be ignored.
	34. Visibility of the subject	The subject of the document is a subject of public debate or scientific controversy
	35. Degree of novelty of the EBPEM	The document brings a new perspective or represents an innovation of some sort.
	36. Robustness of the evidence data	The quality of the evidence is reliable and the date is in sufficient amount. It is convincing for professionals. *Refer to the Cochrane Collaboration risk of bias
	37 Highlighted danger	The document highlights the threat or the danger, insisting on it.
	38. Risks enumerated in order of importance	The risks are in clear order, starting from the most important. This gives a clear picture of all the issues at stake, and their priority.
	39. Risks and responses described objectively	The author does not highlight perspectives and keeps objectivity in presenting the risks and the responses. For example, reporting survival rates for 1 year is incomplete compared to 5 year.
	40. Standard definitions for the various outcomes, risks and benefits	The outcomes, the risks or the benefits are defined the same way and use the same variables as risks and benefits.
	41. Relative risk reduction used	Using absolute risk reduction is more informative and less subjective. Using relative risk reduction is less objective, but more convincing for the reader (Fagerlin et al. 2011)

	42. Use of constant denominators and whole numbers	While comparing results, benefits or risks, the authors uses the same denominators for consistency and prefers to use whole numbers, which are easier to understand than fractions or decimals
	43. Constant timeframes for risks and benefits	Risks and benefits are expressed in the same temporal patterns
	44. Clear difference between baseline and treatment risks	Baseline and treatment risks are clearly established, so that the reader can understand the difference.
	45. Use of positive and negative frames	The author highlights not only the dangers, but also the benefits of the recommended action. Using positive encouragement is more productive than negative (e.g. survival versus mortality)
	46. Interpretation or symbols to convey the meaning	The author uses symbols or some form of interpretation to make the meaning clear
	47. No more than 3 messages	If the messages are no more than three, the practitioner will understand and retain them better, so the impact of the 'truth' will be bigger.
8. 1. Value-truth (Tarde)	48. Endorsement through use of names of renowned people or organizations	The document is “validated” by renowned scientists, organizations or government.
	49. Background or experience of the source, according to the notion of “valeur-crédit” of Tarde.	Sometimes, the document clearly states that the author of the document has some very relevant experience.
	50. Endorsement through disclaimer of interests	There is an official statement about the absence of conflicts of interests.
8.2. Value-usefulness for the physician (Tarde)	51. Message saving time	The documents contains a message that saves time for the practitioner or the patient
	52. Message saving money	The message allows making economies, to choose cheaper drugs or not to perform useless procedure.
	53. Message promoting health	If the practitioner adopts the practice, he will be satisfied or there is some price involved.
	54. Price or satisfaction promised	If the practitioner adopts the practice, he will be satisfied or there is some price involved.
	55. Does not threat self-image	The document does not highlight some deficiency or lack of training in the medical staff or the system.
	56. Contributes towards self-efficacy	The document describes a technology or innovation that will give more self-confidence to the practitioner, allows him to take an informed decision or trusts his judgment.
	57. Increased easiness of procedures	The document shows an easier and better way to do things.
	58. Better organization of the environment	The health-care process will be smoother; the environment will be more organized.
Value-usefulness for the health care system (hospital or government)	59. Messages saving time	
	60 Messages saving money	
	61. Messages promoting health	

8.3. Value-beauty *Value-beauty refers to the human quality side of life; it might be related to the visual aspect of the procedure or its use, such as avoiding handicap in patients, etc.)	62. Esthetic advantage for the patient	The technology described will enhance the aesthetic appearance of the patient or at least will prevent some damage (e.g. avoid amputation)
	Score of the EBPEM	
	Score compared to the maximum	

This Evaluation grid was applied to all 45 EBPEM defined in the previous chapter. For each material, we noted the presence or absence of indicators as 1 or 0: present or absent. In order to ensure reproducibility of the grid, two independent researcher evaluated 35% of the materials and compared their inter-annotator agreement with Cohen's kappa coefficient. The agreement was judged to be very good (0.80 to 1.00). The final results were then summed up in a spreadsheet showing the frequency and distribution of each concept. It was also possible to draw some graphs.

The following section of Analysis presents our findings on the concepts and indicators as they appear on the spreadsheet.

5. Analysis

The printed evidence materials (EBPEMs)⁵ analyzed in our study were published in different countries, at different times and they vary a lot in size, format, appearance and content. Still, the main and most obvious distinction seems to be their target audience and the specific format, appearance, style and its content. The printed documents with proven effectiveness in this study are quick references, peer-reviewed evidence-based publications, newsletters and guidelines.

The first category, quick references, are shorter, with colored graphics and tables, usually distributed to general practitioners and health-care professionals in order to help them summarize the information on a certain health technology or treatment. We have 23 quick references included in our sample.

The second category, full guidelines, consists of longer documents in black and white, sometimes with tables and graphics. They target more specific areas in the treatment of a disease, contain the latest data, and aim to inform the decision process in hospitals and administrations. Usually elaborated by experts in the field with the help of multidisciplinary teams and researchers, they are distributed to medical organizations and specialists by provincial or federal health departments in order to update the health information on a certain subject. We have 6 full guidelines.

Peer-reviewed evidence-based publications, the third category, describe the results of some trials or scientific breakthrough. They contain new developments in medical areas, discuss details in a therapy

⁵ To facilitate the distinction between the analyzed EBPEM, we will often refer to them with the name of the author who mentioned them. For instance, when we speak of the ALLHAT trial, or of Kabir 2007_ALLHAT, we will have in mind the trial of ALLHAT Officers and Coordinators for the ALLHAT Collaborative Research Group (2002). Major outcomes in high-risk hypertensive patients randomized to angiotensin-converting enzyme inhibitor or calcium channel blocker vs. diuretic: The Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT). *JAMA*, 288: 2981–97.

and are more precise on the conduct of the trial than the guidelines in order to invite discussion, offer suggestion for research or attract attention on a subject. The information they contain is not specifically designed to be implemented as clinical practice or diagnostic procedure; their first target audience is scientists, researchers or specialists.

The newsletters and medical articles defined don't have to be necessarily peer-reviewed or to contain the most reliable evidence. They can express personal views or provide additional information on given subjects. In the case of the articles defined in the present study, they are all peer-reviewed, contain robust evidence and are published in reviews such as New England Journal of Medicine, JAMA or BMJ, which allows us to add them to the peer-reviewed evidence.

The peer-reviewed evidence-based materials, guidelines and articles, are 22.

5.1. Appearance in Format and Length

As mentioned before, the most obvious difference between the evidence-based materials is their appearance and length. The quick references are shorter than three pages, they have graphics on the cover, and they are in color and have special formatting. The defined sets are those of Dormuth (2004), Weiss (2011) and the document of Zwarenstein (2007). The Weiss (2011) set comprises 11 evidence-based materials in total that are translated from the quick references distributed by Conseil du Médicament du Québec. They have a distinct logo for adult and children materials. The Dormuth (2004) set consists of 12 documents, with brightly colored graphics, published with the help of the health department of British Columbia. The document defined by Zwarenstein (2007) was elaborated by a team

of designers.

We should mention one peer-reviewed evidence-based material - Effect of Vasodilator Therapy on Mortality in Chronic Congestive Heart Failure (Cohn et al., 1986), defined by Bjornson (1990) – that is shorter than a page, and is black and white. As we will see later, this document somehow does not seem to fall in the pattern of quick references or peer-reviewed publications.

5.2. Graphics

5.2.1. Graphic on the Cover Consistent with the Purpose, Types of Graphics

Facilitating the Understanding, Relevance of Graphics

One of the first things that catch readers' attention is the graphic or the illustration on the cover. In the quick references defined in this study (the only ones with images on the cover), the illustrations are consistent with the purpose, relevant and they facilitate the understanding. The Weiss (2011) materials have a well-designed graphical logo: a human figure similar to Da Vinci drawing on a virus background for the adults, and a cartoon character with pills in his hand, winning over an ugly virus like creature, for the children material. The document described by Zwarenstein (2007) defined document has a photo of a blood pressure check and a cartoon on the cover, representing four physicians' playing cards, all with the same aces in hand (Illustration 1).



Illustration 1. Picture on the cover of the OPEM trial. (Zwarenstein, 2007)

This is clearly associated to the text, explaining the multi-faceted therapy control for diabetes. The evidence-based materials defined by Dormuth (2004) also have cover images related to their content.

There is one observation to be made though: the quality of the content is by far superior to the quality and attention of detail presiding over the choice of graphics. The caricature of four gamblers (Illustration 1) does not seem reassuring and does not depict the wisdom expected from the doctor's informed knowledge. As mentioned in many documents (Doak et al., 1996; US Federal Plain Language Guidelines, March 2011), humor does not translate well across cultures - readers take it literally and often completely misinterpret the meaning or find it culturally offensive. The same point can be made for the issues of Therapeutics Letter, mentioned by Dormuth (2007): the illustrations are a bit distorted, with strange camera angles, and exaggerated color and composition elements. For instance, Medical Management of Benign Prostatic Hyperplasia (Therapeutics Initiative, May 1997, p. 1) has a picture of a two elderly men in front of a medical office, asking each other: "What's your score?" The doctor behind them is checking his watch (Illustration 2).



Illustration 2. Example from Medical Management of Benign Prostatic Hyperplasia

The graphic, brightly colored, brings painful memories of long waiting lists, as depicted in different medias.

The cover of Therapeutics Letter from October 1994, Treatment of Non-Ulcer Dyspepsia in Adults: Common Questions about H₂ – blockers, represents four cartoons like characters will pill heads, named Cim, Ram, Fam, Niz, on a background entitled Histamine.

The picture seems at first sight irrelevant to the content – the document concludes that the only difference between the H₂-blockers is the cost (Illustration 3). Somehow, the quality of the graphic on the cover does not correspond to the quality of the evidence-based material, and the effort put into its creation cannot be compared to a pharmaceutical advertisement.

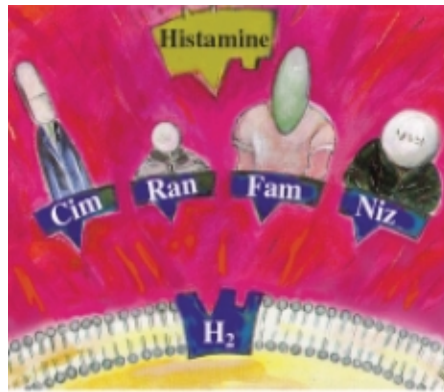


Illustration 3. Example from Treatment of Non-Ulcer Dyspepsia in Adults: Common Questions about H₂ – blockers

Many authors mention the importance of graphics as an aid to presenting information (Doak et al, 1996; Newhauser, 2011). People judge a document by its cover and the image often is a deciding factor in reader's attitude and interest in the recommended evidence-based material. The graphic on the cover has to attract attention, be relevant and consistent with the content, clearly portray the purpose of the writing and promote realism. Wright (2011) and Doak (1996) note that images shouldn't include distracting details or bright colors or background. They are better accepted and remembered when they portray familiar and easily recognizable people, attitudes and behaviors. Nonessential details such as elaborate borders, busy images, etc., distract the viewer.

5.2.2. Captions and Explanations for the Lists and Tables

The evidence-based material examined here present well-presented tables and lists with detailed explanations. The same attention to detail is given to the captions, which acquire a lot of importance for the reader, because they represent a learning opportunity (Doak et al., 1996). In all the documents, the captions are used for tables, lists and charts, but never for graphics.

5.3. Layout and Typography

5.3.1. Clear Layout and Font

As suggested by Doak (1996) and Newhauser (2011), layout and font are important visual paths for the reader. All of the printed evidence-based materials have clean layout and easy to predict sequence of information. The visual cuing indicators such as shading, boxes or subtitles direct attention to specific points of the content. The white space around the text is sufficient to reduce the appearance of clutter; the line length is from 50 to 60 characters, with good contrast between font color and paper. All of this provides a clear visual path for the user.

As for the fonts, all the documents use them appropriately. Mostly, the peer-reviewed evidence based publications and the guidelines are using serif font, Times New Roman 12, which appropriate for longer documents, meant to be consulted on paper – serif font is easier to read on hard copy (US Department of Health and Human Services, Centers for Medicare & Medicaid Services, 2010). The quick references defined by Weiss (2011) and Dormuth (2004) use Arial sans serif, which, along with the shortness of the documents, suggests a possible online use. The pages of those documents are shorter and allow a comfortable view on screen. Below are two examples of format and fonts in printed evidence-based materials. The first is a sample of a page of printed evidence-based material peer-reviewed article: The Effect of Spironolactone on Morbidity and Mortality in Patients with severe heart failure (Bertram et al., 1999). This page is representative of all the peer-reviewed printed evidence-based material evaluated: it is published in renowned journal, the layout is well spaced, uncluttered, the title of the article and of the journal is highlighted, the font is Times New Roman, without extra bolding or italicizing, the margins

are well-defined. The abstract is on the left side, quite visible, so that it is the first thing readers can consult. The text starts with a capital letter, like in many books. The paragraphs are long, but they are well divided. All those elements convey an idea of order, structure and organization; attention to detail that goes beyond the layout and speaks volumes about the content. Readers will trust these documents at first sight; it has a classical and conservative look. We can easily imagine this article in a library, for future scientific consultation.

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THE EFFECT OF SPIRONOLACTONE ON MORBIDITY AND MORTALITY
IN PATIENTS WITH SEVERE HEART FAILURE

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ABSTRACT
Background and Methods: Aldosterone is important in the pathophysiology of heart failure. In a double-blind study, we enrolled 1663 patients who had severe heart failure and a left ventricular ejection fraction of no more than 35 percent and who were being treated with an angiotensin-converting-enzyme inhibitor, a loop diuretic, and in most cases digoxin. A total of 822 patients were randomly assigned to receive 25 mg of spironolactone daily, and 841 to receive placebo. The primary end point was death from all causes.
Results: The trial was discontinued early, after a mean follow-up period of 24 months, because an interim analysis determined that spironolactone was efficacious. There were 386 deaths in the placebo group (46 percent) and 284 in the spironolactone group (35 percent; relative risk of death, 0.70; 95 percent confidence interval, 0.60 to 0.82; $P < 0.001$). This 30 percent reduction in the risk of death among patients in the spironolactone group was attributed to a lower risk of both death from progressive heart failure and sudden death from cardiac causes. The frequency of hospitalization for worsening heart failure was 35 percent lower in the spironolactone group than in the placebo group (relative risk of hospitalization, 0.65; 95 percent confidence interval, 0.54 to 0.77; $P < 0.001$). In addition, patients who received spironolactone had a significant improvement in the symptoms of heart failure, as assessed on the basis of the New York Heart Association functional class ($P < 0.001$). Gynecomastia or breast pain was reported in 10 percent of men who were treated with spironolactone, as compared with 1 percent of men in the placebo group ($P < 0.001$). The incidence of serious hyperkalemia was minimal in both groups of patients.
Conclusions: Blockade of aldosterone receptors by spironolactone, in addition to standard therapy, substantially reduces the risk of both morbidity and death among patients with severe heart failure. (N Engl J Med 1999;341:709-17).
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ALDOSTERONE has an important role in the pathophysiology of heart failure.¹⁻⁴ Aldosterone promotes the retention of sodium, the loss of magnesium and potassium, sympathetic activation, parasympathetic inhibition, myocardial and vascular fibrosis, baroreceptor dysfunction, and vascular damage and impairs arterial compliance.⁵⁻⁷ Many physicians have assumed that inhibition of the renin-angiotensin-aldosterone system by an angiotensin-converting-enzyme (ACE) inhibitor will suppress the formation of aldosterone. In addition, treatment with an aldosterone-receptor blocker in conjunction with an ACE inhibitor has been considered relatively contraindicated because of the potential for serious hyperkalemia.^{8,9} Consequently, aldosterone-receptor blockers are used infrequently in patients with heart failure.^{10,12} There is increasing evidence to suggest, however, that ACE inhibitors only transiently suppress the production of aldosterone.^{7,13-16} Furthermore, treatment with the aldosterone-receptor blocker spironolactone at a daily dose of 12.5 to 25 mg in conjunction with standard doses of ACE inhibitor, a loop diuretic, and in most cases digoxin is pharmacologically effective and well tolerated, decreases atrial natriuretic peptide concentrations, and does not lead to serious hyperkalemia (defined as a serum potas-

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*Other investigators are listed in the Appendix.

Illustration 4. The Effect of Spironolactone on Morbidity and Mortality in Patients with severe heart failure (Bertram et al., 1999)

The second example (Illustration 5) is from the quick-reference Dosage Guidelines for Commonly Used Antibiotics in Children, Weiss (2011). As mentioned previously, all the quick-references have similar format. In the Weiss set, the illustration on the cover – a cartoon character with stethoscope and pills in his hand winning over an ugly virus – means that the documents refer to children diseases. It also reminds of the victory of medicine over ugly diseases.

The format of the page is much more complicated than the previous one. The layout is uncluttered, very visual, with different colors, separators, different fonts, various highlighting of the lines and columns of the table. The font is most sans serif, which suggests a possible online reading. The text is well organized in a table, there seems to be no extra-wording in the paragraphs, the information seems to be concise and up-to-the point.



Dosage Guidelines for Commonly Used Antibiotics in Children

Translated from the original French version published October 2009
This clinical guide is provided for information purposes and is not a substitute for the practitioner's judgment.

Antibiotic Generic name/ Brand name*	Daily oral dose [†]	Dosage interval	Dosage form	Approximate cost [‡] (10-day course)	
				10-kg child	20-kg child
Amoxicillin (Amoxil [®] generic)	50 mg/kg/day 90 mg/kg/day (high dose)	every 8 or 12 hours	125 and 250 mg/5 ml Susp. 250 and 500 mg Cap. 125 and 250 mg Chew. Tab.	\$5 (250 mg/5 ml) \$11 (high dose)	\$11 (250 mg/5 ml) \$22 (high dose)
Amoxicillin- clavulanic acid potassium (Clavulin [®] or others)	45-50 mg/kg/day (amoxicillin) 45-90 mg/kg/day (amoxicillin)	every 8 hours (4:1 formulation) every 12 hours (7:1 formulation) [§]	125 and 250 mg (amoxicillin)/5 ml Susp. 250 and 500 mg Tab. 200 and 400 mg (amoxicillin)/5 ml Susp. 875 mg Tab.	\$9 [¶] - \$19 [¶] (250 mg/5 ml) \$28 [¶] - \$36 [¶] (400 mg/5 ml)	\$17 [¶] - \$37 [¶] (250 mg/5 ml) \$41 [¶] - \$54 [¶] (400 mg/5 ml)
Azithromycin (Zithromax [®] or others)	10 mg/kg D1E, day 1 then 5 mg/kg/day x 4 days (otitis-pneumonia) [‡] 12 mg/kg/day x 5 days (pharyngitis)	every 24 hours	100 and 200 mg/5 ml Susp. 250 mg Tab.	\$8 [¶] - \$16 [¶] (100 mg/5 ml)	\$12 [¶] - \$24 [¶] (200 mg/5 ml)
Cefprozil (Ceftin [®] or others)	30 mg/kg/day (otitis-sinusitis) 15 mg/kg/day (pharyngitis)	every 12 hours	125 and 250 mg/5 ml Susp. 250 and 500 mg Tab.	\$12 [¶] - \$24 [¶] (250 mg/5 ml)	\$24 [¶] - \$48 [¶] (250 mg/5 ml)
Cefuroxime axetil (Ceftin [®])	30 mg/kg/day (otitis-sinusitis)	every 12 hours	125 mg/5 ml Susp. 250 and 500 mg Tab.	\$23 (Susp.)	\$40 (Susp.)
Cephalexin (Keflex [®] generic)	25-50 mg/kg/day (pharyngitis)	every 6, 8 or 12 hours	125 and 250 mg/5 ml Susp. 250 and 500 mg Tab. or Cap.	\$10 (250 mg/5 ml)	\$19 (250 mg/5 ml)
Clarithromycin (Biaxin [®])	15 mg/kg/day	every 12 hours	125 and 250 mg/5 ml Susp. 250 and 500 mg (Biaxin Big [®]) Tab.	\$29 (125 mg/5 ml)	\$41 (125 mg/5 ml)
Clindamycin (Dalacin [®])	20-30 mg/kg/day	every 8 hours	75 mg/5 ml Susp. 150 and 300 mg Cap.	\$23	\$34
Metronidazole (Flagyl [®] generic)	30 mg/kg/day	every 6 or 8 hours	250 mg Tab.	\$0.70	\$1.40
Nitrofurantoin (Macrobid [®] generic)	5-7 mg/kg/day	every 6 or 8 hours	50 and 100 mg Cap.	\$3	\$6
Penicillin V (Pen-Vec [®])	25-50 mg/kg/day	every 6 hours every 12 hours (pharyngitis)	125, 180, 250 and 300 mg/5 ml Susp. 300 mg Tab.	\$3 (300 mg/5 ml)	\$7 (300 mg/5 ml)
Trimethoprim- sulfamethoxazole (Septra [®] generic)	8-12 mg/kg/day (Trimethoprim)	every 12 hours	40 mg (TMP)/5 ml Susp. 20, 80 and 160 mg (TMP) Tab.	\$2 (Susp.)	\$4 (Susp.)
Vancomycin (Vanocin [®])	40 mg/kg/day	every 6 hours	125 and 250 mg Cap.	\$296 (125 mg)	\$592 (250 mg)

* Only one brand name product is listed although several manufacturers may market other brand names.
[†] Daily oral dose must be divided according to recommended interval. Maximum daily dose must not exceed adult dose.
[‡] Approximate cost based on prices listed in the *Guide de médicaments* published by the Régie de l'assurance maladie du Québec (RAMQ) (juin 2009), excluding pharmacist's service charge and wholesaler's markup. Certain conditions may require treatment courses that are longer or shorter than 10 days.
[§] The 7:1 (BID) formulation of amoxicillin-clavulanic acid potassium (Clavulin[®]) is preferred because of its better Q2 tolerance.
[¶] Price of generic drug.
[‡] Price of brand-name drug.


www.cdm.gouv.qc.ca 

Illustration 5. Dosage Guidelines for Commonly Used Antibiotics in Children

The document obviously seeks to attract reader's attention, and to point him quickly to the right direction – dosage guidelines for children. The fact that the text is in a table conveys the idea of having the most important information in a nutshell. All the data looks classified; the format is appropriate for quick consultations or reminders. We can easily imagine the doctor having this on his desk, and checking it for patients.

5.3.2. Short Paragraphs, Sentences and Words

Usability guidelines recommend keeping the sentences shorter - from eight to ten words; and to use one main idea per paragraph – no more than three to five sentences (US Department of Health and Human Services, Centers for Disease Control and Prevention, 2006; US Federal Plain Language Guidelines, 2011). In fact, if the readers are distracted, or less skilled, shorter sentences and paragraphs work well to convey complex information, because they break the information into smaller, easier-to-process and easier to manage units (Newhauser et al., 2011).

It is beyond the scope of this work to measure quantitatively all the sentences, words or paragraphs in the evidence-based materials. It was possible though to compare documents, and to establish which documents are relatively short and which are longer. Peer-reviewed evidence-based materials are longer, detailed, their paragraphs and sentences are very long, and contain many enumerations and details. Quick references and guidelines, 29 of the documents, on the contrary, have very short paragraphs and sentences.

Almost all the quick references considered in Weiss (2011) and Dormuth (2004) studies expose their

ideas in bullet-form list, or as Frequently asked questions (FAQ). The quick reference A-B-C in Diabetes, defined by Zwarenstein (2007), also uses bullets and text boxes to limit the length of paragraphs.

It is worth noting to see that the guidelines, some of which are longer than 100 pages, try to limit their paragraphs and the number of sentences they contain. They achieve this with very structured lists containing numbers and references. This is the case of the evidence-based material Effective Health Care defined by Black (2002) and Mason (1998) and of the AHA/ACC guidelines for secondary prevention for patients with coronary and other atherosclerotic vascular diseases, defined by Fonerow (2009). The AHA/ACC guidelines text is divided in 8 chapters, each with secondary and tertiary numbering, and it is all in 154 pages, evidence-based material, tables, and special cases included.

All the paragraphs in the guidelines are relatively short, mostly because of a strict subdivision of the material with letters and numbers. In general, the clear organization of content, the attention paid to formatting and graphics, the participation of multidisciplinary teams and the endorsement from government institutions suggest that guidelines and references target a larger audience.

5.3.3. Italics, Bold, Subtitles and Text Delimited by Clear White Space

The peer-reviewed publications: trials, guidelines and reviews, use appropriately italics for references, bold for the titles and subtitles, according to the rules of writing scientific documents. The subtitles are visually well placed. As expected, the quick references have more variety in fonts and subtitles: the subtitles of Therapeutics Letter for instance, are Frequently Asked Question discussing different aspects

of the topic, in various colors. Zwarenstein's evidence-based material, “A-B-C in Diabetes”, is organized around the three letters and the corresponding subtitles: A for Angiotension converting enzyme inhibitors (ACEI); B for Blood pressure reduction and C for Cholesterol lowering agents – the three main components in diabetes control. The Weiss (2011) documents have consistent subtitles: General, Diagnosis, Guidelines (Zwarenstein, 2007, p. 4).

5.4. Content

The content section aims to evaluate the presence of factors such as clear purpose, limited scope, summary or review, and information limited to key ideas that determine the inner structure of the information. The first four items are first suggested in the Suitability assessment of materials, SAM, (Doak, 1996) aiming to evaluate health-related information for adults. Since its publication, SAM is largely used to assess medical information.

5.4.1. Purpose and Scope

Suitability assessment of materials, SAM, (Doak, 1996) states that the purpose of a document should be explicitly stated in the title, on the cover illustration or in the introduction. As for the scope, it should be limited to essential information, directly related to the purpose (Doak, 1996; Newhauser, 2011). All the defined effective evidence-based material has clearly stated purpose and limited scope, the title reflects the main ideas of the content, and so do the introduction and the cover illustration. In general, it is clear that all the documents have good internal structure and consistency. For example, the title “Atorvastatin in Patients with Type 2 Diabetes Mellitus Undergoing Hemodialysis” (Wanner, et al., 2005) evaluates

clearly the effect of atorvastatin in diabetes patients. The trial entitled “The effect of spironolactone on morbidity and mortality in patients with severe heart failure” (Pitt, 1999) does a complete analysis of the effects of the drug and compares it with three other medications.

In general, the scope and purpose of quick references and peer-reviewed information are well defined and if there is a difference, it is only in the level of details examined. The quick references, usually on more general subjects, have a limited scope and clear purpose – there is nothing unnecessary, out of place or unrelated. Their purpose is to give all the important information on the subject in a nutshell.

Peer-reviewed evidence-based material has a narrow scope and focus on precise points and small details while describing the conditions and technicalities of the trial, its outcomes and variables. Their purpose is to trace the way for future research in a specific health question, the level of details provide necessary milestones for future researchers. Let us take for instance the trial defined by Majumdar (2003), “Effects of angiotensin-converting-enzyme inhibitor, ramipril, on cardiovascular events in high-risk patients”. The trial is focusing on the long-term effect of a hypo-tensor, ramipril, in heart failure. The conclusion of investigators is that:

“Our findings show that ramipril, an angiotensin- converting–enzyme inhibitor, is beneficial in a broad range of patients without evidence of left ventricular systolic dysfunction or heart failure who are at high risk for cardiovascular events. Treatment with ramipril reduced the rates of death, myocardial infarction, stroke, coronary revascularization, cardiac arrest, and heart failure.” (The Hear Outcomes Prevention Evaluation Study Investigators, 2000, p. 150).

But they go further in the discussion and continue with all the details of the finding; details that are related to the trial, but maybe not directly to the proof of the evidence. Such level of statistical details traces the road for future investigations and proves the pragmatic approach of evidence-based medicine.

“We believe that the extent to which our results may have been affected by the inclusion of patients with undiagnosed low ejection fractions is very small, because a large sub study of 496 consecutive patients at three centers indicated that only 2.6 percent had an ejection fraction of less than 0.40, an extensive review of charts identified only 8.1 percent of patients with a low ejection fraction before randomization, and treatment was clearly beneficial in the subgroup of 4772 patients who were documented to have preserved ventricular function (relative risk, 0.73; 95 per- cent confidence interval, 0.63 to 0.84; $P < 0.001$) and in those with no history of myocardial infarction (relative risk, 0.77; 95 percent confidence interval, 0.65 to 0.91; $P = 0.002$).” (The Hear Outcomes Prevention Evaluation Study Investigators, 2000, p. 151).

The level of technical precision in the results is authenticated and amplified if we take into consideration the large scale of the research that most documents display. The ACC/AHA practice guidelines, just as far as the literature search is concerned, confirm that:

“Literature searching was limited to publications on humans and in English from 1990 to 2004. In addition to broad-based searching on MI, specific targeted searches were performed on MI and the following subtopics: 9-1-1, patient delays, emergency medical services (EMS), pre hospital fibrinolysis, pre hospital ECG, ED, supplemental oxygen, nitroglycerin, ASA, clodhopper, arrhythmia, re perfusion, fibrinolysis/fibrinolytic therapy, angioplasty, stent, coronary artery bypass graft surgery (CABG), glycoprotein (GP) IIb/IIIa, pericarditis, beta-blockers, scheming,

intra- arterial pressure monitoring, ACE inhibitors, amiodarone, procainamide, lidocaine, electrical cardio version, atropine, temporary pacing, transvenous pacing, permanent pacing, cardiac repair, heparin, low-molecular-weight heparin (LMWH), unfractionated heparin (UFH), ramipril, calcium channel blockers, verapamil, nifedipine, magnesium, stress ECG, invasive strategy, secondary prevention, statins, and cholesterol”. (American College of Cardiology Foundation and the American Heart Association, Inc., 2004, p. e8)

This adds to the credibility and the potential impact of the apparently limited on details scope of evidence-based publications, justifies the findings and the research.

5.4.2. Summary or Review

Another element of SAM is the presence of summary or review, which would highlight the important facts and allow readers to grasp the key points. In the examined evidence-based materials, 22 documents have summaries, all of them peer-reviewed evidence-based documents and guidelines. The only guideline without summary is the full guidelines of 2004 on cardiac infraction, mentioned by Fonarow (2009) – this might be due to the large scope of the document which covers all the aspect of the disease in primary, secondary and tertiary care. Another exception is the short intervention defined by Bjornson (1990), but the document is less than a page all together.

As a rule, quick references don't have an abstract, because they are extremely short and concise. All the documents defined by Weiss (2011) sum all the treatment of a disease in a bullet format, with different

colors. The documents defined by Dormuth (2007) focus on a larger topic, such as hormone therapy for instance, and they describe all the aspects of the subject: diagnosis, treatment, indications, risks and side effects, in two to three sentences. If itself this is a summary of the best evidence and the most important facts, it is useless to provide additional review.

As for the quality of summaries, or abstracts, they follow the guidelines of the CONSORT statement criteria (Moher et al., 2010) used by the Cochrane Collaboration. As Napoll (2011) mentions, it is known that clinicians, policymakers and medical reporters, who read Cochrane collaboration reviews, do not read beyond the plain language summary and the abstract. They expect to see a summary of all the relevant information, in a standardized form. Cochrane reviews set the golden standard for most of the evidence-based publications - all of the peer-reviewed evidence-based publications have clear, concise and well-organized summaries according to the CONSORT statement criteria (Moher et al., 2010). The fact that the summaries are organized in sections - Context, Objective, Design, Intervention, Outcomes and Conclusions – makes them a useful tool for researchers, who can easily browse through the methodologies, subjects and sections and choose the most pertinent for their research.

Quality summaries and reviews seem mandatory for efficient peer-reviewed evidence based documents, but this does not seem to be the norm for quick references. The explanation is clear; readers often miss the key points upon first exposure without a summary (Doak, 1996; Newhauser, 2011). The summary in the beginning of the documents is essential in order to explain the most essential points, resume the content about the precise behavior to adopt and suggest appropriate approaches. The first few sentences

or moments of communication might be the only chance to share key messages and to do the follow up with more details and information because some of readers might want to go further and get more information (Zwarenstein, 2011).

5.4.3. Information Limited to Key Ideas

It is important for authors to provide clear messages and to structure the information around it. All of the printed evidence-based materials defined contain well structure key messages and the content of the documents revolves around them. It is easier to identify the messages in quick references because the documents are shorter, but evidence-based publications do not deviate from the main ideas either. As an example of material organized around the key ideas, Zwarenstein's (2007) material is interesting. It is entitled “A-B-C in Diabetes”. The highlighted messages are three: use ACEIs to manage diabetes, control the Blood-pressure control and use Cholesterol-lowering agents. As simple as A-B-C. The message to remember, A-B-C, is reminded at the beginning and at the end. The quick references defined by Dormuth (2007) summarize things in a different way – the FAQ introduce important messages concerning the recommended treatment. For instance, in Therapeutic Letter, is the question:

“Are there differences in convenience or cost? The preferred regimen for chronic preventive therapy is once daily dosing. All thiazide and thiazide-like drugs should be prescribed only once daily in the morning. There are significant cost differences. Hydrochlorothiazide is the least expensive of all antihypertensive drugs available in B.C.” (Therapeutics Initiative, June 1995, p. 2)

The question introduces the information and the key message is given. The reader is then directed to the

table for additional information.

5.5. Plain Language

5.5.1. Active Voice, Reading Level and Limited Use of Medical Jargon

Many authors point to the importance of plain language for writing good communication materials (Doak, 1996; Newhauser, 2011; US Federal Plain Language Guidelines, 2011; US Department of Health and Human Services, Centers for Disease Control and Prevention, 2006 and 2010; US Department of Health and Human Services, Office of Disease Prevention and Health Promotion, 2010). In the Evaluation grid are included several elements: reading level, active voice, limited use of medical jargon, context given first and learning aids via “road signs”. In the course of our work, it became obvious that the first three categories need quantitative definitions beyond the scope of this project. For instance, the only way to measure the reading level is to use special software; the use of active voice or medical jargon has to be defined, quantified and measured in every sentence.

Still, it is possible to evaluate the EBPEMs based on a subjective comparison between documents, while also taking into consideration the fact that the audience for these materials is mostly physicians and scientists, whose reading level is between 14 and 19. Some documents show a clear effort for simplification of the style, even though, for the average reader, it is above grade 7. As Newhauser (2011) notes, most health materials can be written in level 7 language, which is also the opinion expressed in Federal Plain Language Guidelines (2011) and Toolkit for Making Written Material Clear and Effective (2010).

Our comparative evaluation shows that 23 materials, all of them quick references, such as Dormuth (2004) Weiss (2011) and Zwarenstein (2007) use simpler language than this used in the clinical trials, the guidelines and the peer-reviewed materials. For instance, in Therapeutics Letter from November 1995, “To sleep or not to sleep”, the sentences: “An improvement in sleep habits is the initial and continuing goal in all patients. This includes appropriate caffeine, alcohol and nicotine restriction, daily physical aerobic exercise, regular sleep and awakening times (including weekends), avoidance of large meals late in the evening, and maintaining a good sleep environment.” (Therapeutics Initiative, November, 1995) are quite different from the following:

“For all randomized patients, the Kaplan–Meier event rates of the primary end point at two years were 26.3 percent in the standard-dose pravastatin group and 22.4 percent in the high-dose atorvastatin group, representing a 16 percent reduction in the hazard ratio favoring atorvastatin (P=0.005; 95 percent confidence interval, 5 to 26 percent)”. (Cannon et al., 2005, p. 4).

The first example is understandable, it uses simple, everyday words, and the meaning is clear. The second example deals with difficult to grasp concepts, from the area of statistics, engineering etc. making it difficult to understand even by doctors.

With the same type of comparison for the medical jargon it can be deducted that 24 evidence-based publications use less medical jargon – mostly quick references. They target a public of general practitioners and even patients – the language is really simplified, as it can be seen in the previous example. In comparison, analytical reviews and trials are based on abstract and conceptual language, involving medical and highly technical terms. They also involve another level of detail in the

explanations, which makes the materials much more difficult to read from a terminological point of view.

Concerning the use of active voice, it is difficult to measure this element without quantitative analysis. Almost all the evidence-based materials use active voice, but quite often sentences are long, complex and contain embedded information. Here is an example: “Six-year rates of hospitalization for gastrointestinal bleeding, available only in Medicare and Department of Veterans Affairs participants, occurred in 8.8%, 8.0%, and 9.6% participants in the chlorthalidone, amlodipine, and lisinopril treatment groups, respectively, with no significant differences (Table 5).” (The Heart Outcomes Prevention Evaluation Study Investigators, 1999). Active voice makes material easier to understand because there is a direct and logical progression from subject performing the action to verb to object. Sentences with this direct flow are easy to read, and they encourage people to keep reading (US Department of Health and Human Services, Centers for Medicare & Medicaid Services. (2010).

5.5.2. Context

Placing the reader in the right context is important to present the environment of the problem to be solved, and to present the point of view of the researcher. The majority of the effective evidence-based publications evaluated (32) present a context. If there is no context, which is the case for 13 quick references, it seems to be because they start with a short reminder of the disease or contain no more than a table for dosage of drugs.

The context can consist of a short paragraph – general description of the disease, brief overview of the main treatment guidelines, or a problem that justifies the need for research. It gives a clear picture of the range of possible outcomes and justifies the authors' decisions. In all evidence-based materials, the context is always precise and objective, factual, relating an unresolved medical problem and explaining the purpose of the investigation and the why the evidence-based materials tries to elucidate it. Mostly, contexts are similar to this one:

“Treatment and complications among the 50 to 60 million people in the United States with hypertension are estimated to cost \$37 billion annually, with antihypertensive drug costs alone accounting for an estimated \$15.5 billion per year. Over the past decade, major placebo-controlled trials have documented that ACE inhibitors and CCBs reduce cardiovascular events in individuals with hypertension. However, their relative value compared with older, less expensive agents remains unclear. There has been considerable uncertainty regarding effects of some classes of antihypertensive drugs” (The ALLHAT Officers and Coordinators for the ALLHAT Collaborative Research Group, 2002, p. 1).

First, the importance and the cost of hypertension treatment are highlighted, the complications are explained, and the uncertainty of the treatment options justifies the trial.

In general, all the effective printed evidence-based materials are characterized by factual and objective data in the context, proved with statistical and scientific facts, which justifies the development of the arguments to change the practices in the field. In the evidence-based material we evaluated, there seems to be no subjectivity in the context, allowing people to construct their opinion in an apparently stable

way, immune to context effects. At the same time, this context is more convincing, especially for a public of scientists.

5.5.3. Learning Aids via “Road Signs”

Reader’s understanding is facilitated also by the use of learning aids via “road signs” (Doak et al., 1996), meaning that learning is enhanced by advance organizer, or headers or topic captions which tell the reader very briefly what is coming next. These “road signs” make the text look less intimidating and prepare the reader’s thought process to expect the announced topic. In the evaluated evidence-based materials, these elements were considered present, when advance organizers or logical paths preceded more than 50% of topics.

In the materials we evaluated, only 13 use “road signs”, mostly the sets of evidence-based material defined by Dormuth (2004) and Zwarenstein (2011). In Therapeutics Letter materials, this signage is very clear – after a short introduction and definition of the disease, the documents is presented with a FAQ. Here is one example in the issue of June 1996: 'What are the initial goals of care for the menopausal woman? What are the indications for hormone therapy? What are the important non-drug therapies? What are the side effects that limit the use of hormone therapy?' (Therapeutics Initiative, June, 1996, p.1). The questions punctuate the text, and allow the reader to focus on the most important aspects of the therapy. The FAQ are structured in a similar way, the word “What” is repeated at every sentence and the questions are in different color and font. The quick reference guides of Conseil du médicament du Québec (Weiss, 2011) also present some features that can serve as “road signs” - the different sections of the document are in different colors, with clear subtitles in all documents: General,

Diagnosis and Treatment guidelines. The communication document prepared for the OPEM trial described by Zwarenstein (2007) had also some features that guide the reader throughout and establish internal logic – the subtitles start with A, B and C and correspond to the ABC letters in the title. The whole theme is resumed once again in the conclusion, under the same title “A-B-C in diabetes” (Zwarenstein, 2007, p.4).

As for the rest of the evaluated EBPEM, we did not see anything similar to learning aids. Peer-reviewed evidence-based materials have similar subtitles, but they don't guide the reader or remind him where he is in the document or what the next section is going to be. It seems that they follow the established standards of CONSORT 2010 checklist of information to include (Moher et al., 2010).

5.6. Learning Stimulation and Motivation

This subcategory is inspired from the SAM material (Doak et al., 1996). We retained the importance of explaining and modeling behaviors - people learn more readily by observation and by doing it themselves rather than by reading about it (Doak et al. 1996; Newhauser, 2011). They also assimilate faster when the text uses specific examples familiar to the public, rather than abstract or general terms. In all the documents that we examined, there was some form of modeled behavior. Still, 38 materials seem to show concrete models of behavior, in one form or another.

5.6.1. Behaviors Explained and Modeled

This element is present, under one form or another, in 38 of all the documents and aims to assess whether the documents explain what to do or alert on what not to do and who is most likely to be impacted. It is interesting to see that all documents contain some information on appropriate behavior or alert on some negative changes (Doak et al., 1996, Newhauser, 2011).

This is particularly true for the guidelines and for the quick references. The quick references are quite explicit for the dosage and behavior. Guidelines go further and explain behavior, environment, follow-up etc. - the information they contain is relevant for doctors and all health-care professionals and decision-makers. For instance, the ACC/AHA Guidelines for the Management of Patients With ST-Elevation Myocardial Infarction (American College of Cardiology and American Heart Association Task Force on Practice Guidelines, 2002) are very extensive on the prescribed behavior – they provide guidance on the pathology of the disease, the recognition of symptoms and of patients at risk; the evidence-based materials give information on the evaluation and treatment before and after hospitalization, on optimal strategies, adverse events, electrocardiogram techniques, biomarkers, hypotension, pulmonary congestion etc. The guidelines cover not only what should be done on hospital grounds but also what public facilities should have medical equipment and trained people. Here is an example:

“All EMS first responders who respond to patients with chest pain and/or suspected cardiac arrest should be trained and equipped to provide early defibrillation.

All public safety first responders who respond to patients with chest pain and/or suspected cardiac arrest should be trained and equipped to provide early defibrillation with AEDs.

Dispatchers staffing 9-1-1 center emergency medical calls should have medical training, should use nation-ally developed and maintained protocols, and should have a quality-improvement system in place to ensure compliance with protocols. “(Braunwald et al., 2002, p.e16).”

Even in medical trials, when the document is starting with a hypothesis about a recommended behavior, the possible implications of the therapy are clearly indicated. Here is an example of a document named Atorvastatin in Patients with Type 2 Diabetes Mellitus Undergoing Hemodialysis:

“We conclude that in persons with type 2 diabetes mellitus who are receiving maintenance haemodialysis and have LDL cholesterol values between 80 and 190 mg per deciliter, routine treatment with a statin to reduce the primary composite end point of death from cardiac causes, myocardial infarction, and stroke is not warranted. The initiation of lipid- lowering therapy in patients with type 2 diabetes mellitus who already have end-stage renal disease may come too late to translate into consistent improvement of the cardiovascular outcome.” (Wanner et al., 2005, p. 18).

It should also be noted that evidence-based trials present a behavior in the study design. If the behavior is introduced in practice, the trial will present how it is possible to introduce a slight modification in the dosage, in order to improve the long-term outcome. This study design is very familiar to the readers and is very detailed, as we can read in Effects of angiotensin-converting-enzyme inhibitor, ramipril, on cardiovascular events in high-risk patients:

“Study Design The double-blind, two-by-two factorial, randomized Heart Outcomes Prevention Evaluation study evaluated ramipril and vitamin E in 9541 patients. A sub study compared a low dose of ramipril (2.5 mg per day) with a full dose (10 mg per day) or placebo; there were 244

patients in each group. The results of the placebo- controlled study of full-dose ramipril are given here. The effects of vitamin E are reported in a companion paper. The design of the study has been reported previously; a brief summary follows.” (The Heart Outcomes Prevention Evaluation Study Investigators, 2000, p. 196).

5.6.2. Parallel between Experience, Logic and Language of the Readers

It is important that means that the language, the format and the topic of the EBPEM correspond to the reader’s level of education, language or professional background. The majority of the evidence documents, 39 of the 45, match their audience. Of course, the documents that are to be used by general practitioners have less numbers, the language is slightly simpler and the instructions as to what therapy to use seem simpler and more straightforward. One example is the quick-reference Treatment of Clostridium Difficile-Associated Diarrhea or Colitis (Weiss, 2011) that explains what should be the pediatrician considerations for treatment:

“Diarrhea: common antibiotic-associated adverse effect in pediatrics.

No observed increase in frequency or severity of C. difficile-associated colitis in children as opposed to that reported adults.

Difficult to establish a causative role for C. difficile in mild GI infections.

C-difficile associated manifestation: profuse and bloody diarrhea.” (Clostridium Difficile-Associated Diarrhea or Colitis , p. 1)

The peer-reviewed evidence-based publications use a much more elaborated language and formulation as it addresses a public of medical specialists. The peer-reviewed materials use more complex notions, introduce statistical and engineering tools and calculations, and are often based on hypothesis as a starting point. Still, all of the reviewed documents aim to give some meaningful advice or recommendations. “Neither amlodipine (representing CCBs, particularly dihydropyridine [DHP] – CCBs) nor lisinopril (representing ACE inhibitors) was superior to chlorthalidone (representing thiazide-type diuretics) in preventing major coronary events or in increasing survival.” (The ALLHAT Officers and Coordinators for the ALLHAT Collaborative Research Group, 2002).

5.6.3. Cultural Diversity

The third element aiming to improve reader's motivation is the cultural diversity. A first meaning is given by Geist-Martin et al. (2003) discussing the case study of AIDS. The authors distinguish five layers of cultural meaning: ideological, sociopolitical, institutional and professional layer; ethno-cultural and familiar layer and interpersonal layer of meaning. None of the studies attempt to examine the problem and to have a look at it.

The second meaning of cultural diversity is as a concept used to differentiate the different cultures. Once again, this dimension was not addressed in the evidence-based materials analyzed. At the most, the reader can find statistical data for myocardial infarction, mentioning that among the variety of the studied patient population, there are so much African-Americans, Caucasians and Asians. In the ATP III trial there is a similar mention:

“African Americans have the highest overall CHD mortality rate and the highest out- of-hospital

coronary death rates of any ethnic group in the United States, particularly at younger ages. Although the reasons for the excess CHD mortality among African Americans have not been fully elucidated, it can be accounted for, at least in part, by the high prevalence of coronary risk factors. Hypertension, left ventricular hypertrophy, diabetes mellitus, cigarette smoking, obesity, physical inactivity, and multiple CHD risk factors all occur more frequently in African Americans than in whites. Other ethnic groups and minority populations in the United States include Hispanics, Native Americans, Asian and Pacific Islanders, and South Asians.” (Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults, 2001, p. 2489).

But this statement does not qualify as understanding of cultural diversity, because it addresses the racial diversity in terms of medical statistics, it does not appeal to the different cultures in order to promote a recommended behavior. Empirical studies in medicine observe that different populations or races have different predispositions to certain diseases and this is taken into consideration in the text.

5.6.4. Narrative

When we evaluated the presence of absence of narrative, we were looking for a personal perspective somewhere in the text, or some form of personal testimony. People make sense of their environment through narratives, they think with stories (Morris, 2001). In making decisions about treatments, physicians are influenced by the stories, advices or experiences of their pairs. But we did not find any trace of personal information in the document, no advice, no opinion, not a personal experience. The style was very clean and politically correct in a way, there is not even a broader narrative related to the experience of patients or to the satisfaction of doctors.

5.7. Risk

5.7.1. Evocation of Urgency

Risk messages are characterized by urgency, and research suggests a direct link between fear-arousing conditions and message acceptance (Berkowitz, 1962; Sutton, 1980). According to Witte and Allen (2002): “the stronger the fear aroused by a fear appeal, the more persuasive it is” (Witte, 2002, p. 601). For the purpose of this study, evocation of urgency means concerns raised by the documents that have to be answered immediately in order to improve morbidity or mortality of the patients.

In the documents we defined, only 27 evoke urgency. Those are mainly the quick-references and the guidelines. This is understandable because the quick references are fast-paced; they often adopt a vibrant, commanding tone urging the physicians to act in a certain way. Similarly, guidelines are dealing with vital issues and they aim to change radically the adopted behaviors on all levels – hospital, administrative and individual. In the guidelines defined by Mason (1998) the risk is clearly stated:

“Depression affects a majority of people at some time in their lives and it is strongly associated with social and economic circumstances. The classification of major depression episode is important in treatment. Half the cases of major depression are unrecognized in primary care, especially where the patient presents with physical symptoms.” (Effective Health Care, March 1993, p.3).

Among the peer-reviewed evidence-based publications that evoke urgency are the famous HERS and HERS II, ALLHAT and WHI trials: all evidence-based material with conclusive and important results. For a lot of cases, delay in the therapeutic response could result in poor health outcome or medical mistakes. An example from the WHI trial: “This article reports principal results for the trial of combined

estrogen and progestin in women with a uterus. The trial was stopped early based on health risks that exceeded health benefits over an average follow-up of 5.2 years.” (WHI, 2002, p. 323).

The results for urgency are somehow less strong than expected. It might be that a lot of evidence-based materials are bound by political correctness and they tend to avoid expression of emotion. Medical objectivity and need for empirical data might be another explanation – why evoke urgency, if the results are half-proven by experience, and still need to be validated by all the medical authorities. And then, this low display of urgency might come from some form of self-restraint – given the fact that all documents deal with intense subjects, such as coronary heart diseases, hormone therapy or high risk situations – they will be highly visible in the medias before they are ready to handle that visibility.

5.7.2. Highlighted Danger

In the printed evidence-based materials we evaluated, 24 publications highlight danger - 13 of the 25 quick references and 11 of the 20 full guidelines and peer-reviewed publications. An example from The Treatment of Depression in Primary Care – illustrates this:

“Around 60-70% of adults will at some time experience depression or worry of sufficient severity to influence their daily activities. For the majority of people episodes of depression are short lived, but a minority of people experiences a range of severe psychological and physical symptoms which may persist.” (Effective Health Care, November 1993, p.3).

And another example from the ACC/AHA 2002 Guideline Update for the Management of Patients With Unstable Angina:

“These guidelines address the diagnosis and management of patients with UA and the closely related condition NSTEMI. These life-threatening disorders are a major cause of emergency medical care and are responsible for more than 1.4 million hospitalizations annually in the United States (40).” (Braunwald et al., 2002, e16). It is clear that the authors clearly show the danger inherent, without exaggeration, and let it speak for itself.

It is clear that the printed evidence-based materials do not exaggerate or color danger; it does not distort the facts to prove its advantage. In fact, just as in the context, effective evidence-based material just exposes the facts in a quite unobtrusive way, in all objectivity. But this is enough for the majority of physicians, just the brief reminder of the real facts speak volumes.

5.7.3. Clear Perception of Risks

In health communication, it is important to evaluate the risks, clearly stated, without ambiguity. It happens that, affected by emotions or stress, people have difficulty understanding correctly the message (Argo, 2004). It is therefore essential to give a clear perception of the risks, of the costs and the benefits, to allow people to construct stable and informed preferences and decisions.

In the 45 defined EBPEM, 37 give a clear perception of the risk, especially guidelines and quick references. Here is an example from one of Dormuth (2004) defined quick references:

“The Framingham Study showed an increased risk with estrogen use which was predominantly seen in women over 60.6. Coronary heart disease and stroke are prevalent in postmenopausal women (lifetime probability 46% and 20%, respectively) and are common causes of death (31% and 8%, at a median age of 74 and 83, respectively) “(Therapeutics Letter, May 1996. p.2).

And another example from ACC/AHA guideline:

“These guidelines address the diagnosis and management of patients with UA and the closely related condition NSTEMI. These life-threatening disorders are a major cause of emergency medical care and are responsible for more than 1.4 million hospitalizations annually in the United States (40). Nearly 60% of these admissions are among persons greater than 65 years old, and almost half occur in women. In 1997, there were 5,315,000 visits to US emergency departments for the evaluation of chest pain and related symptoms (41).” (Braunwald et al., 2002, e18).

Those two examples show that effective evidence-based material shows clearly the risk and proves it with numbers.

5.7.4. Commanding or Vibrant Tone

As seems important to communicate some affective meaning to people (Peter, 2011), and to adopt a commanding or vibrant tone while recommending something. The majority (31) of EBPEM, display a commanding tone or intense rhythm. Among them, the quick reference “Changing concepts in the management of asthma” clearly dictate what the physician should think in terms of objectives:

“What are the goals of therapy?

- To control and prevent symptoms (cough, wheezing, dyspnea).
- To maintain normal activity levels and lung function. (spirometry).
- To prevent exacerbations.” (Therapeutic Letter, January 1996, p. 1)

The tone is intense, commanding and the recommendations are clear, the authors have no doubt about the efficiency of what they are recommending.

In the guidelines, we can find another, more toned-down style. The National Institute for Clinical Excellence recommends that the best prostheses (using long term viability as the determinant) are those whose revision rate is less than 10% in 10 years. They state clearly that this revision rate “should” be regarded as the current “benchmark” in the selection of prostheses for primary Total Hip Replacement.” (National Institute for Clinical Excellence, 2000, p.3). "Should" in the document is repeated several times, it translates the command. Our findings about the frequency of affect in the tone prove the importance of the display of affect. Even though the medical literature has a pragmatic dimension, the readers can read some emotion or certainty in the arguments advanced and this is expressed in their choice of words, adjectives, and arguments, all of which make the document more convincing. The reader feels that the certainty of the author, the appropriateness of the recommended behavior, and this affective meaning that is important. This finding proves that information should convey affective meaning, to be better used by readers (Peters, 2011). Probably, this contributes to the effectiveness of the documents.

5.7.5. Effectiveness of the Required Response

Reiter & Kok (2011) show that people are more likely to respond with the recommended behavior if their response will be highly effective. The majority of EBPEM analyzed 40 materials out of 45, appeal for decisive actions of some sort. In order to respond, the practitioner has to take clear position or decisive action, which will give concrete and precise results. Of course, if he is confident in his ability to perform a recommended action, has high self-efficacy and believes that a recommended action will be

effective; he is more likely to do what is recommended. Perceived response efficacy (i.e., the belief that the recommended response works in reducing the perceived threat) (Witte, 2000) in face of threat, will lead to a quick, sure and efficient decision. As an example to illustrate this let us take one of the quick-references of Dormuth (2004) on H. Pylori:

“Most patients with recurrent peptic ulcer disease will be "cured" once the parasite is eliminated - they will no longer need any maintenance therapy for suppression of ulcer symptoms. The evidence-based material states clearly that “In a recent study of 35 patients in whom H. pylori was effectively eradicated, 32 (92%) remained H. pylori and ulcer negative after an average follow- up period of 7 years.” (Therapeutics Initiative, November 1992, p.1).

5.7.6. Visibility of the Event

It should be mentioned that visibility of the disease is important factor increasing the impact of the health threat. We all know by experience how some diseases suddenly become prominent in the media – H1N1, AIDS, cancer, cardiovascular diseases etc. Most EBPEM are on highly visible topics. A total of 30 materials, including ALLHAT, WHI, MIRACL trials etc. - are on topics discussed by the media: hormone therapy, depression, heart disease, persistent glue ear, etc. One example is the national guideline Treatment of Persistent Glue Ear in Children (University of Leeds, 1992), defined by Black (2002), who highlighted the impact of one national guideline: the increase in unnecessary surgeries for a condition that can resolve by itself was not only curbed, it resulted in a 7.9% annual decrease of the rate of surgery for children less than 10 years of age.

It seems though that visibility and success of the trial are intertwined – given the impact of certain trials, it is also probable that they provoked discussions and questioning in the medical community.

5.7.7. Degree of Novelty of the Threat

This evaluated element is closely related to the previous. In fact, it is clear that the evidence-based materials that are effective have also a characteristic that we can call degree of novelty of the EBPEM, according to a concept of Ajzen (1972). Novelty is also a form of usefulness, because it brings a new perspective and represents innovation of a sort (Dearing, 2009).

In all the defined evidence-based material, 24 EBPEMs, mostly the peer-reviewed trials and publications, are considered as innovations of some sort. The findings of those evidence-based materials contradict some common trend in therapy. One of those articles is the WHI trial mentioned earlier, contradicting the existing belief that hormone therapy can be a panacea for women; another is the ALLHAT trial that proves that thiazide type diuretics are superior in preventing cardiovascular diseases and are less-expensive than the conventional hypo-tensors. The guidelines defined by Black (2002) stop the common trend of operating persistent glue ear in children, while the Roberts (2007) guidelines recommend the use of the older type of cemented prostheses for hip replacement. The 20 remaining EBPEM, which are not novelty, are quick references and they function more like reminder for the physician.

5.7.8. Probability of the Depicted Event

Effectiveness of warnings about perceived threat is enhanced when the probability of the threat is increased, and when it is dramatized (Reyna et al. 2009; Craig, 2011). It is interesting to find that the majority of the evidence-based material, 38 documents, is on highly probable events. Quite often, the probability of the threat is highlighted in the context that triggers interest. Thus the reader can read that menopause and depression can affect the majority of people at some point in their lives or that cardiac diseases are extremely common. Pain-killer prescriptions are even more common, and they are not always without adverse effects, as the study *The Development, Implementation And Evaluation Of Prescribing Guidelines In General Practice*, Watson, 1998) suggests. In order to highlight the importance of her recommendations, the author starts the background of her study with the following: “There are 18 non-aspirin non-steroidal anti-inflammatory drugs (NSAIDs) (Appendix 2) available for use in general practice in the UK. These drugs account for a large proportion of the 20 million prescriptions for anti-rheumatic drugs dispensed in the UK each year.” (Watson, 1998).

5.7.9. Gravity of the Threat of the Event

As a factor positively influencing the cognitive processing of warnings and disclosures, the gravity of the threat (Witte, 2000; Andrews, 2011) is present in 30 of the 45 defined evidence-based materials. But the documents are somehow discreet on the gravity of the threat, even though all of the printed materials are on serious conditions, such as cardiac diseases, major depression, and surgical operations. The only expressions used to signal threat – death – are “primary outcomes” as a substitute for fatal myocardial

infraction, and “secondary outcome” as combined cardiac disease, stroke, angina, heart failure etc. Only the quick references of Dormuth (2004) and Weiss (2011) use more clear words to describe danger. In general, the threat is present, but not really highlighted.

5.7.10. Robustness of the Evidence Data

According to the criteria of bias defined by the Cochrane Collaboration, 23 of the 45 EBPEM, present robust evidence data. Those are all the peer-reviewed evidence-based materials, which we will call “the hard-evidence”, as compared to the quick references of Dormuth (2004), Weiss (2011) and Zwarenstein (2009), which we will call “soft-evidence” (the distinction in evidence robustness seems important as we will see later and leads to more unique characteristics of the two groups of evidence). The “hard-evidence” based materials shows extensive research, thorough methodology and analysis, coherent trial procedure and scientific value. It meets the criteria established by the CONSORT 2010 checklist of information to include when reporting a randomized trial (Moher et al., 2010). The quick references do not seem to follow CONSORT standards.

The CONSORT checklist states that all the evidence-based material should have an abstract or a structured summary of trial design, methods, results and conclusions, along with an introduction that gives scientific rationale for the study. The Methods section should describe the trial design and establish clear eligibility criteria for the participants, the settings and the location of the data. The outcomes should specify how they are defined, specified (primary and secondary outcomes) and assessed); what are the statistical methods to compare groups, etc. The results have to present

participants, show recruitment and baseline data, and the numbers should be analyzed. The Discussion section should state the trial limitations and the potential bias.

All of the “hard-evidence” publications have those sections corresponding to the previous criteria.

Below is an example of a result that summarizes all the conclusions, in numbers, and comparisons, as shown it in an abstract:

“Results: Mean follow-up was 4.9 years. The primary outcome occurred in 2956 participants, with no difference between treatments. Compared with chlorthalidone (6- year rate, 11.5%), the relative risks (RRs) were 0.98 (95% CI, 0.90-1.07) for amlodipine (6-year rate, 11.3%) and 0.99 (95% CI, 0.91-1.08) for lisinopril (6-year rate, 11.4%). Five-year systolic blood pressures were significantly higher in the amlodipine (0.8 mm Hg, P=.03) and lisinopril (2 mm Hg, P 0.001) groups compared with chlorthalidone, and 5-year diastolic blood pressure was significantly lower with amlodipine (0.8 mm Hg, P 0.001). For amlodipine vs chlorthalidone, secondary outcomes were similar except for a higher 6-year rate of HF with amlodipine (10.2% vs. 7.7%; RR, 1.38; 95% CI, 1.25-1.52). For lisinopril vs. chlorthalidone, lisinopril had higher 6-year rates of combined CVD (33.3% vs. 30.9%; RR, 1.10; 95% CI, 1.05-1.16); stroke (6.3% vs. 5.6%; RR, 1.15; 95% CI, 1.02-1.30); and HF (8.7% vs. 7.7%; RR, 1.19; 95% CI, 1.07-1.31).” (The ALLHAT Officers and Coordinators for the ALLHAT Collaborative Research Group, 2002)

5.7.11. Risks and Advantages Enumerated in Order of Importance

In 35 evidence-based materials, risks and advantages are enumerated in order of importance. They are in clear order, starting from the most important, which gives a clear picture of all the issues at stake, and their priority. This objectivity informs physicians' choice and helps them construct stable preferences, and alternative preferences in a scientific context. As Fischhoff (2011) notes, not showing the full context of a decision can lead to biased choices – even when no bias is intended.

The WHI trial “Risks and Benefits of Estrogen plus Progestin in Healthy Postmenopausal Women”, lists the health threats by priority, starting with the most important and deadly risk of cardiovascular diseases: “a sufficient number of CHD events had occurred by 5.2 years of average follow-up to suggest that continuation to the planned end would have been unlikely to yield a favorable result for the primary outcome of CHD”. The second risk “... of breast cancer emerged several years after randomization” and the third risk by importance: “The reductions in clinical vertebral fractures, other osteoporotic fractures, and combined fractures supported the benefit for hip fractures found in this trial.” (Writing Group for the Women's Health Initiative Investigators, 2002, p. 323).

Quick references also prioritize the risks, as it can be seen from the Dormuth (2004) evidence-based material, Medical Management of Benign Prostatic Hyperplasia, which lists the benefits of medications in descending order:

“Alpha-1-antagonists reduce symptoms in some patients. Their effect is detectable within 2 weeks. The evidence of a significant benefit to risk ratio for finasteride is less clear. Saw palmetto extracts cannot be recommended because effective doses of available preparations have

not been established and evidence of safety and long term efficacy are insufficient.” (Therapeutic Letter, May, 1997, p.2).

5.7.12. Risks and Responses Defined in Objective Way

In defined evidence-based material, 38 publications provide objective information about the risks and benefits, with an equal distribution among the quick references and the peer-reviewed publications. The ALLHAT trial provides a good example: “The reduction in colorectal cancer in the hormone group is consistent with observational studies, which have suggested fairly consistently that users of postmenopausal hormones may be at lower risk of colorectal cancer.” (The ALLHAT Officers and Coordinators for the ALLHAT Collaborative Research Group, 2002, p. 2981). Another example from the same trial:

“During the 5.2 years of this trial, the number of women experiencing a global index event was about 100 more per 10 000 women taking estrogen plus progestin than taking placebo. If the current findings can be extrapolated to even longer treatment duration, the absolute risks and benefits associated with estrogen plus progestin for each of these conditions could be substantial and on a population basis could account for tens of thousands of conditions caused, or prevented, by hormone use.” (p. 2982)

Keeping objectivity is especially important while describing results; because it will help the audiences decide what matters to them. Besides, the outcomes will have different properties at different times (Fischhoff, 2011). Putting the right priorities first cannot be done without objective definition of risks. Highlighting perspectives can, consciously or not, manipulate choices. Technical experts often

distinguish between "objective" risk, as a product of scientific research, experimental studies etc. and "subjective" risk which refers to non-expert perceptions of that research (Fischhoff, 1984) such as definitions of risks and responses in a non-objective way.

In the case of the ALLHAT trial (The ALLHAT officers and coordinators for the ALLHAT Collaborative Research Group, 2002), the risks are objective, which denotes a scientific approach. And the relationship between objective definition of risks and efficiency seems to be directly proportional, because almost all of the defined evidence-based materials are considered effective and all define objectively risks and responses.

5.7.13. Standard Definitions

Fischhoff (2011) and Fragerlin (2011) stress the importance to express risks in statistical or numerical terms, for instance in years of survival after operation, life-years etc. Standard definitions for the various outcomes, risks and benefits are especially important when it comes to scientific documents or documents intended to allow an objective decision-making. It is interesting to state that 38 of the evidence-based material we have offer precise definitions of outcomes identifies, including quantitative estimates of risks, costs and benefits, as well as sometimes indicating the quality of the evidence-based material. For instance, Wang (2005) defined as efficient the Executive Summary of the Third Report of the National Cholesterol Education Program (NCEP) on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. The researchers who prepared the report elaborated a method for standardizing risk assessment and based on it, they were able to give a precise picture of long and short-term risks and cholesterol level.

“Method of Risk Assessment: Counting Major Risk Factors and Estimating 10-Year CHD Risk. Risk status in persons without clinically manifest CHD or other clinical forms of atherosclerotic disease is determined by a 2-step procedure. First, the number of risk factors is counted. Second, for persons with multiple (2+) risk factors, 10-year risk assessment is carried out with Framingham scoring (see Appendix) to identify individuals whose short-term risk warrants consideration of intensive treatment.” (Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III, 2486).

From a communicational perspective, using standard definitions for risks and benefits increases risk perception (Fagerlin, 2011; Fischhoff, 2011), it has a positive impact on people with low numeracy skills, increases the understanding of those with higher numeracy skills and allows simplifying the information for people under stress, and gives “respectability” to evidence-based materials.

5.7.13. Difference between baseline and treatment risks and benefits

Most treatments have side effects, and it is important to make clear the differences between the baseline risk (i.e., risk that is present without treatment) and the additional/ incremental risk experienced due to the treatment.

In the defined evidence-based material, 33 materials show clearly the side effects of the treatment, equally distributed among quick references and peer-reviewed publications. In most cases, peer-reviewed publications focus essentially of one aspect of the side effects, such as blood pressure, haemodynamic effect etc. Here is an example:

“Results: Likewise, all-cause mortality did not differ between groups. Five-year systolic blood pressures were significantly higher in the amlodipine (0.8 mm Hg, P=.03) and lisinopril (2 mm Hg, P0.001) groups compared with chlorthalidone, and 5-year diastolic blood pressure was significantly lower with amlodipine (0.8 mm Hg, P.001).” (The ALLHAT Officers and Coordinators for the ALLHAT Collaborative Research Group, 2002, p. 2982).

On the other side, treatment risks are better defined in the quick references and they give a more global picture of all the factors included.

“What are the consequences of thiazide therapy? Using recommended low-dose regimens (table) the incidence of hypokalemia is small (1% of patients in the SHEP study had K⁺ below 3.2 meq/L). Do not prescribe K⁺ supplements; they are inconvenient and expensive. The small increase in total cholesterol (2.5%) and triglycerides seen in some studies was not seen in the TOMHS study and has not been proven to have any adverse consequences. The hyperglycemic effect is also small and did not have any consequences in the SHEP study in which at least 10% of patients had NIDDM on entry.” (Therapeutics Letter, June 1995, p. 2).

5.7.15. Relative Risk Reduction

Three approaches can describe risk change: relative risk reduction (a 50% risk reduction), absolute risk reduction (a reduction from a 6% risk of breast cancer to 3%) or the number of people needed to do the treatment. Using absolute risk reduction is more informative, while relative risk reduction is more convincing for the reader (Brown et al., 2011). It is interesting to note that relative risk reduction is used mostly in peer-reviewed evidence-based publications: in 14 of the 20 materials, or in 70% of them. Only

9 of the 25 quick references, or 36%, use this type of reduction. For instance, the ALLHAT trial states that:

“The primary outcome occurred in 2956 participants, with no difference between treatments. Compared with chlorthalidone (6- year rate, 11.5%), the relative risks (RRs) were 0.98 (95% CI, 0.90-1.07) for amlodipine (6-year rate, 11.3%) and 0.99 (95% CI, 0.91-1.08) for lisinopril (6-year rate, 11.4%)”. (The ALLHAT Officers and Coordinators for the ALLHAT Collaborative Research Group, 2002, p. 2981).

As for a quick references, here is an example of absolute risk reduction as in Management of Anxiety Disorders in Primary Care: “A meta-analysis of 47 studies with 2111 patients showed that in order of effectiveness: clomipramine > fluvoxamine = fluoxetine = sertraline > imipramine = nortriptyline” (Therapeutic Initiative, February, 1997, p.1).

The results mean that materials, considered the gold standard in terms of scientific objectiveness, present more often relative risks, which influence readers perception, and they use this in graphs, charts etc. This way to present results, based on extremely small numbers, in more impressive terms, knowingly or unknowingly, maximizes the impact of the study. The use of numbers contributes to legitimate knowledge in the eyes of the reader and they contribute to build-up the “truth-value”.

5.7.16. Constant Denominators and Whole Numbers

Constant denominators and whole numbers are important to communicate objectively the risks and benefits (Fagerlin, 2011; Fischhoff, 2011). Almost 70 % of the studies, or 35 of the 45, use constant denominators for risks and advantages. The peer-reviewed, evidence-based publications are 19 out of 20, and the number of quick references is 17 in 23. Concerning the use of whole numbers, quick references and peer-reviewed studies have a different approach. Peer-reviewed publications tend to use very small percentages and they illustrate this with tables, charts and graphs.

The quick references use less constant denominators, and more often whole numbers. There seems to be a conscious effort to facilitate the reading and understanding as we can see for this example for antibiotic in Weiss (2011): “Trimethoprim (Generic) - Dosage interval: every 8 hours - Dosage form: 250 mg Tab. - Approximate cost† (10-day course unless otherwise mentioned) \$9 (7 days)” (Therapeutic Initiative, March, 1993, p.2).

5.7.17. Constant Timeframes

Fagerlin (2011) and Fischhoff (2011) highlight the importance of time frames, in order to define better risks and facilitate comparisons. The evidence-based material we evaluated uses well temporal patterns – 33 materials present consistent timeframes for risks and benefits, and almost all the rest do not need to use the variable time. Here is a standard example from the REVERSAL trial in which the timeframes for the comparison groups are two years:

“Between June 1999 and September 2001, 654 patients were randomized and received study drug; 502 had evaluable intravascular ultrasound examinations at baseline and after 18 months of treatment.” (Nissen et al., 2004).

Constant timeframes in evidence-based materials are frequent, proving once more time a desire for objective presentation of the facts.

5.7.18. Positive and Negative Frames

In order to convince people it is important to use positive and negative frames. Gain frames emphasize the positive effects of the behavior or the treatment, whereas a loss frame highlights the disadvantages of performing the behavior. Using positive encouragement is more productive than negative: e.g. survival versus mortality (Ruiter, 2011) because gain-framed messages are better accepted by the public and more likely to prevent potential maladaptive responses. Fagerlin (2011) demonstrates that negative frames are more effective when dealing with uncertainty and risk (for instance, waiting the results of a mammogram), while positive frames are more effective in situations where the outcomes are certain (using car seats decreases injuries in children).

In the EBPEM analyzed, only 20 studies use or try to use positive frames. It does not seem to come naturally: VALUE trial (Julius et al., 2004), has a short introduction that sounds like a gain-frame but the style becomes quickly negative after that:

“Substantial benefits in prevention of major cardiovascular morbidity and mortality in high-risk populations have been reported with calcium antagonists and angiotensin-converting enzyme (ACE) inhibitors... Subsequently, the second National Australian Blood Pressure study reported fewer cardiovascular events in patients treated with ACE inhibitor compared with diuretics. (Julius et al., 2004, 2024).

In a similar way, the Bjornson (1998) defined trial uses the word “survival” once, but “mortality” is much more frequent.

In the first extract, the authors seem to start with the desire to give positive news, but quickly they adopt the tone in the other evidence-based materials – based on mortality rates, death from all causes, primary and secondary outcomes. Clearly, the communication seems more focused on negative frames. Habit, desire to highlight the risks, or just results – it is difficult to decide.

5.7.19. Interpretations and Symbols to Convey the Meaning

Most of the evidence-based material, 39 documents, use tables, charts, lists and graphics to convey the meaning and express the results. And there are several graphics and figures in each material to express the findings. The REVERSAL Trial for instance, has several figures, tables and graphics, taking into account all the aspects of the trouble, and ultrasound Images at baseline and follow-up. (Nissen et al. For the REVERSAL Investigators, 2004).

The “hard-evidence” materials have much more graphics and figures than the “soft-evidence” ones. For instance, the quick reference Drugs of Choice in the Treatment of Hypertension, Part 1 (Therapeutics Initiative, June 1995, p.2) has just one table Dosing and Cost of Diuretics for the Treatment of Hypertension.

5.7.20. Limited Number of Messages

Fagerlin (2011) notes the importance of more laconic messages, which can be understood by high and low numeracy audiences. Less is more, according to Peters and colleagues (2007), who proved that decision-making process results in better outcomes with less information, because the process required less cognitive effort. Similar studies in hospital show better decision-making through improved comprehension and higher quality choices, particularly among participants with lower numeracy skills. Fagerlin (2011) tested the impact of providing only two choices to patients and found that knowledge and speed of processing increased significantly.

The evidence-based material we analyzed has mostly less than three messages: 38 evidence-based materials show limited number of messages, which gives more impact to the main recommendation. For instance, the HOPE trial entitled Effects of an Angiotensin-converting-enzyme Inhibitor, Ramipril, on Cardiovascular Events in High-risk Patients, evaluates all the factors of myocardial infarction and concludes with only one message: “Ramipril significantly reduces the rates of death, myocardial infarction, and stroke in a broad range of high-risk patients who are not known to have a low ejection fraction or heart failure.” (The Heart Outcomes Prevention Evaluation Study Investigators, 2000, p. 361). The publication of this study was associated with a substantial increase in prescriptions for ramipril in Canada and the US - it accounted for 30% of all ACE inhibitors prescribed in Canada and for 6% in the United States (Majumbar et al., 2003).

5.8. Value

Tarde (1902) distinguished between three forms of value: value-truth, value-utility, and value-beauty. Value-truth refers to knowledge for its own sake, the goal of all sciences, and of enlightenment. The value-utility value is determined by desire and belief and had to do with the intensity of these two forces. It is comprised of the value of goods, power, rights, merits, and wealth. Value-beauty has many different types depending on predilections and tastes.

5.8.1. Value-truth

5.8.1.1. Endorsement through Use of Names of Renowned People or Organizations

The first thing that physicians will most likely investigate in evidence-based material is its value as truth. And doctors exercising in groups or who are well integrated in the medical community seem to adopt rapidly the innovation (Steffensen et al., 1999; Auvray, 2003; Katz, 1957). The importance of social networks among doctors is important to diffuse and validate the innovation. So, one of the first concepts that doctors are searching for is the value-truth through the estimated professionals. In this aspect, endorsement of the value of the evidence-based material through use of names of renowned people or organizations is important. The document has to be “validated” by renowned scientists, organizations or government.

In the defined evidence-based materials, 38 were endorsed by prestigious organizations – government and professional associations in the case of guidelines, such as the American College of Cardiology/American Heart Association Task Force on Practice Guidelines in the case of the material of Fonerow (2009), National Institute for Clinical Excellence (NICE) is a part of the National Health Service (UK) in the case of Roberts (2002) etc. Quick references are endorsed by Department of

Pharmacology and Therapeutics to provide physicians and pharmacists and the province of British Columbia, in the case of Dormuth (2004) materials, or Québec associations of pharmacists and physicians in the case of Weiss (2011) evidence-based materials.

5.8.1.2. Background or Experience of the Source

The question is a little bit different for the background or experience of the source, according to the notion of “valeur-crédit” of Tarde. By that, we mean the relevant experience and credibility of the author which becomes important precisely in situations when the physician does not know what therapeutical course to take, he will have a tendency to trust a renowned author or specialist competent in resolving problematic situations. Physicians who report similar attitudes toward evidence are more likely to exchange information and advice first through collaborative relationships, then within a field of specialization or in affiliation with hospital sites, and organizational clinical directorates (Katz, 1957; Mascia et al., 2011).

Only 15 materials are backed up by an author with some very relevant experience and this is mostly what we called “hard-evidence”. The “soft-evidence” is mostly written by anonymous teams and endorsed by some eminent organization. For instance, Outcomes in hypertensive patients at high cardiovascular risk treated with regimens based on valsartan or amlodipine: the VALUE randomized trial, is signed by several researchers: Stevo et al. for the VALUE trial group. Quite often, peer-reviewed evidence-based publications cite all the author's contributions, their involvement in projects and their affiliations.

Quick-references on the other side, do mention any particular author. The Weiss (2011) set mentions 12 documents for physicians and pharmacists, translated from Conseil du médicament du Québec and that are (in fact were, the site is unavailable) on the following site: <http://www.cdm.gouv.qc.ca/site/aid5166.phtml>. There is no name of publisher, translator or author.

The set defined by Dormuth (2004) has 11 publications, which can be referred as: Therapeutics Initiative. (1994). Definitive treatment of peptic ulcer disease by eradication of H. pylori. Therapeutics Letter, 2 (20), without any name of author.

It is clear that any physician will view the hard-evidence materials more seriously and he will be impressed by the names and reputation of the authors.

5.8.1.4. Endorsement through Disclaimer of Interests

It is interesting that only 5 printed evidence-based materials explicitly state a disclaimer of interest. The “soft-evidence” materials simply does not have it, and the quite often, in the “hard-evidence” the list of authors is so long that there is always a statement, saying that at least one of the authors participated in a sponsored trial. As an example, we can cite the ACA/AHA guidelines:

“The ACC/AHA Task Force on Practice Guidelines makes every effort to avoid any actual or potential conflicts of interest that might arise as a result of an outside relationship or personal interest of a member of the writing panel. Specifically, all members of the writing panel are asked to provide disclosure statements of all such relationships that might be perceived as real or potential conflicts of interest. These statements are reviewed by the parent task force, reported orally to all members of the

writing panel at the first meeting, and updated and reviewed by the writing committee as changes occur.” (Braunwald, E. et al. 2002, p.e18).

But at the same time, the document lists, in Appendix 1 and 2, the relationship that some writing committee members have with the industry.

Obviously, in most cases, authors of trials and printed-evidence based materials are connected through consultancy or sponsorship with major pharmaceutical companies.

5.8.2. Value-usefulness

5.8.2.1.. Messages Saving Time

It is important that the printed evidence-based materials save time for the individual physician and for the organization – it can add usefulness to the value of the document.

The first important remark is to see that timesaving is rarely mentioned but the notion is directly implied in many procedures described. In our view, 12 evidence-based materials, mostly quick references, contain messages that save time for physicians and the health care in general.

One of the peer-reviewed evidence-based materials that save time are the guidelines for hip replacement defined by Majumbar (2007): “If you have already had a hip replacement, please do not worry. This guidance does not mean that your hip joint is not safe or should not have been used.” (Braunwald et al.,

2002, p. e16). This message avoids unnecessary worries, time-consuming procedures and waiting for patients and doctors.

The ACC/AHA Guidelines for the Management of Patients With ST-Elevation Myocardial Infarction defined by Fonarow (2009) clearly include a poster entitled T.I.M.E. Act in time to Heart-Attack Signs (e14) to show patients and physicians what are the first signs of heart-attack. Still this poster shows the importance to act quickly, but it does not save really time.

Quick-references, on the other side, save indirectly time by allowing the physician to check rapidly the available data on dosage, procedures, therapies etc. They clearly indicate when to stop hormone therapy for instance, what antibiotics to use, what are the goals of the therapy or when is it necessary to perform a test for H. Pylori in case of inflammatory gastritis etc.

5.8.2.2. Messages Promoting Health

If the evidence-based material promotes health, it will have an extra-value for the physician, the patient or the organization. All the messages promote health, in one form or another, and they are useful for the physicians. The quick references do that in a concise form, the peer-reviewed publications aim to study particular aspects of the treatment. They are all useful to physicians.

There is a difference though between “health-promotion” and healing. To promote health is a larger concept than goes beyond treating the disease or healing, and it is connected with the notion of prevention and well-being. Still, very little of the evidence-based materials defined touch this aspect of

health promotion. The only two materials that promote health in the environment for the patient, are those related to asthma and depression. Still, both of those diseases are in a way environment related. The quick-reference Changing concepts in the management of asthma, advises physicians to pay attention to the allergenic factors: “Education of the patient and family is an essential component of asthma management; in specific settings it has been associated with reduced morbidity.” (Therapeutics Initiative, January, 1996, p. 1). The guidelines The Treatment of Depression in Primary Care states:

“A range of non-cognitive drugs such as cognitive therapy, psychotherapy, social work support and counseling is used for the treatment of major depression. Cognitive therapy has been shown to be as effective as usual treatment in primary care. Counseling is increasingly available in primary care, but requires evaluation as an intervention for depression.” (University of Leeds, 1993, p. 1).

In general, it seems that evidence-based materials consider health promotion mostly as far as it is related to the treatment of patients.

5.8.2.3. Messages Allowing to Save Money

It is interesting to note that among the 18 evidence-based materials evaluated as containing a message on cost-efficiency, that might present some value-usefulness for the physician and the system, there are 15 quick references and 3 guidelines.

One of the guidelines is this defined by Mason (1998) on treatment of depression in primary care:

“The selective serotonin reuptake inhibitors (SSRIs) are of similar efficacy and have similar drop-out rates to other cheaper antidepressants, and their widespread use as the routine first-line treatment

in major depression could result in an increase in the NHS drug budget for antidepressants in England of over 100 m a year.” (University of Leeds, 1993, p. 6).

The guidelines of Roberts (2007) on the selection of prostheses evaluate the cost of operation, replacement, manufacturing of various kinds of prostheses, and finally suggest using the cheapest and the most solid ones (National Institute for Clinical Excellence, 2000).

The remaining 15 evidence-based materials that represent some value-usefulness in promoting a cost-effectiveness model are all quick references. For the most part, they clearly indicate the cost of medications per day, the generic drugs etc., as in the following example from Dormant (2004): “500 mg QID 2 weeks for each of the 3 ingredients⁵ Amoxil, ApoAmoxi, Axicillin, Novamoxin, Nu Amoxi, Pro Amix \$0.84”. (Therapeutics Initiative, 1994, p. 2).

5.8.2.4. Price or Satisfaction Promised

With the desire to evaluate all the possible outcomes, we evaluated another aspect of the possible value-usefulness of the printed evidence-based material – the price or satisfaction promised. With that we wanted to understand if the document promised some kind of moral or material satisfaction if the practitioner adopts the practice. In terms of moral satisfaction, we were interested even in some type of positive formulation of results such as “Your patient will see his grandchildren grow”, reassurance that cardiovascular disease or cancer will be avoided etc.

Material satisfaction was not mentioned anywhere, neither moral recognition. There was just one possible moral satisfaction. In a quick reference by Dormuth (2004), entitled Definitive Treatment of

Peptic Ulcer Disease by Eradication of Helicobacter Pylori (H.pylori), it is stated clearly that “Most patients with recurrent peptic ulcer disease will be "cured". This means they will no longer need any maintenance therapy for suppression of ulcer symptoms.” (Therapeutics Initiative, 1994, issue 4, p. 1) We defined this definitive treatment as a source of satisfaction for the physician, because it will be fast and secure and it will give spectacular results.

This is an interesting finding, suggesting that effective evidence-based material does not promise price or satisfaction.

5.8.2.5. Message that Does not Threat the Self-image of Physicians

One of the criteria in value-usefulness for the physician is that the message should not threaten the self-image of physicians. By that, we mean that it should not highlight some deficiency or lack of training in the medical staff or the system.

The majority of documents, 38, do not cast any doubt on the system or the competency of doctors. It is interesting to see that the guidelines are the only documents that suggest more education to physicians or a different allocation of resources in the health care system. This can be explained first with the large scope of those documents, with the volume of various data and findings and also with the big teams that are working to extract every possible meaning of the information.

The treatment of persistent glue ear in children (Effective Health Care, 1992, vol. 4) is an example of guideline with data from over 25 years, the objective of which is to show the uselessness of surgical interventions that cure glue ear in children. The document states clearly:

“The rate of surgery for glue ear has greatly increased over the last 25 years and has been described as "an epidemic". This increase does not appear to reflect significant changes in the underlying prevalence of the condition. Because of the large resources devoted to surgery for glue ear it is important to try to determine how much of this surgery is really necessary and to develop means by which unnecessary interventions can be minimized.” (University of Leeds, 1994, p. 1). The implied critic for surgeons who perform this unnecessary operation is clear.

Another guideline, “The Treatment of Depression in Primary Care”, states:

“Around half of patients with major depression are routinely recognized by GPs, although much higher rates of detection have been reported, indicating the potential for case finding in general practice. Training and the use of routine screening instruments can improve the ability of GPs to detect major depression amongst practice attendees, and there is evidence that early detection and treatment may reduce the likelihood that the condition will persist.” (University of Leeds, 1992, p. 4).

In the document it is clearly stated that GPs should have additional training in order to recognize major depression, which in the majority of cases finishes with suicide. Further it is suggested to give reliable tests in primary care and allocate resources for cognitive therapists who will work in close relation with the doctors, to better recognize depression.

Self-image is important part of self-efficacy, as defined by Grol (2004) and Michie et al. (2005). Michie defines self-efficacy as control of behavior, material and social environment, perceived competence, perceived behavioral control, self-esteem, self-confidence or professional confidence. As a result, if the printed evidence contributes to build the self-image of the physician, it will contribute to a better self-efficacy and eventually trigger a behavior-change.

5.8.2.6. Messages Increasing Self-efficacy

This indicator about not threatening physicians self-image is closely related to the one of messages describing a technology or innovation that will give more confidence to the practitioner, allow him to take an informed decision, to trust his judgment more and ultimately to increase his self-efficiency.

Twenty-nine documents promote self-efficiency and they are mostly quick references. Physicians are motivated to learn and adopt the recommended behavior when they believe the task or the behavior is doable. Often authors subdivide the complex topics in the documents in small parts so that the readers can experience small successes in understanding the behavior to adopt or the problem to solve. Thus, knowingly or not, they apply the recommendations for usability.

The quick references of Conseil du médicament du Québec, mentioned by Weiss (2011) promotes self-efficacy: they sum up all the important points and give practical instructions what to do, how much and what medicine to give. Organized by disease and by type of patient, they provide all the necessary information on the virus, the etiology, the diagnosis, the treatment guidelines etc. Even a recently graduated doctor will find it easy to respect these guidelines – they are written in a commanding tone, clearly, without unnecessary explanations, but with a good level of practical details.

There are some articles that do not promote self-efficacy. One of them is Guidance on the Selection of Prostheses for Primary Total Hip Replacement (National Institute for Clinical Excellence, 2000) which, as showed above, insists on the importance of training for surgical teams. Another guideline, The treatment of Depression in Primary Care, states explicitly that primary care physicians do not recognize the signs of depression and cannot treat it (University of Leeds, 1993).

5.8.2.7. Increased Easiness of Procedures

The presence of this element of value-usefulness evaluates if the documents show an easier and better way to do things. In the evaluated evidence-based material, there are only two quick references that seem to give advices facilitating the daily routines of physicians. The first one, Drugs of Choice in the Treatment of Hypertension Part 1, recommends to use thiazides in cases of hypertension. This facilitates and speeds up the choice of doctors dealing with the complicated regimen of hypo tensors:

“Based on the evidence available at this time and using criteria of effectiveness and cost, thiazides are clearly the drug of first choice. Based on the criteria of efficacy, tolerability and convenience, thiazides are equivalent to or better than all other drugs. Therefore, thiazides are the drug of first choice for most uncomplicated hypertensive patients.” (Therapeutic Initiative, June 1995, p. 3).

The other quick reference that may increase easiness of procedures is on hormone therapy. It is apparently published shortly after the results of the WHI trial advising against hormone therapy, and questioning doctor's prescription habits in the matter. The quick reference clearly indicates the approach

to follow, how to promote non-drug therapies and how to leave the final choice to women (Therapeutic Letter, May 1996, p. 3).

5.8.2.8. Better Organization of the Environment

This last element assessing value-usefulness aims to evaluate if the evidence-based material provide some advice on how to make the health-care process smoother and the environment more organized.

Only five evidence-based materials seem to promote better organization of the environment, three quick-references and two guidelines. The first trial, entitled The treatment of Depression in Primary Care clearly states that “given the multifactor causation of depression, FHSAs, purchasing authorities and local authorities should identify ways in which co-coordinated interventions in the health and social spheres can be developed to help depressed individuals” (Effective Health Care, March 1993, p. 3). Another quick references “ Changing concepts in the management of asthma”, suggests a healthier environment to avoid irritants, with “a clear role for physicians and patients to identify triggering allergens and irritants, and to institute a systematic program to eliminate, or substantially reduce such exposures” (Therapeutic Letter, January 1996, p. 2). The study states specifically that education of the patient and family is an essential component of asthma management to promote healthier environment.

These examples show that therapy is not enough and they promote a healthier, more organized environment to increase health outcomes.

5.8.3. Value-beauty

5.8.3.1. Esthetic Advantage for the Patient

The technology described will enhance the esthetic appearance of the patient or at least will prevent some damage to his integrity. In our estimations, two quick references and two peer-reviewed evidence-based publications are related to this aspect of esthetic advantage for the patient.

One of the quick-references that represent an esthetic advantage for the patient is that on definitive treatment of peptic ulcer disease by eradication of H. Pylori (Therapeutic Letter, November, 1994) which suggests eradicating the H. Pylori infestation and curing the patient, definitely. This would avoid maintenance therapy for suppression of ulcer symptoms and allow the patient to live a normal life.

One of the first “hard-evidence” materials, “The Treatment of Persistent Glue Ear in Children” (Effective Health Care, 1992, 4) suggests imposing a period of watchful waiting before operating, in order to avoid unnecessary interventions. This study also represents an esthetic advantage for the patient, because it does not entail his physical integrity and avoids unnecessary operations. The other hard evidence-based material is Guidance on the Selection of Prostheses for Primary Total Hip Replacement. It suggests using cemented prostheses because they have a lower rate of replacement and once again, will avoid unnecessary surgery for the patients. (National Institute for Clinical Excellence, 2000). In the sample evidence-based publications, there is not a single allusion of cosmetic change or advantages in terms of appearance.

In our view, any avoidance of intervention is a ‘beauty’ benefit for the patient, who proposes his natural appearance and functions. Health is beautiful.

6. Discussion

In the previous section, an Evaluation grid containing 62 theory-based communication indicators was applied to 45 EBPEM. The objective of the study was to assess whether those communication concepts were present in the evidence, how were they expressed in the document and what their effect was.

Ideally, it would have been very interesting to compare the results of this analysis to the efficiency of the printed material and to its success in changing behavior. This is impossible unfortunately, because the data on efficiency is not consistent – authors describe efficiency in different periods and countries, through various measures and statistics, and it is difficult to find common denominator.

The present study will therefore focus on the presence, absence and expression of some communication concepts and their indicators in the EBPEM. This will help us understand what are the strong points, the weaknesses and the difference between materials.

The previous Analysis section highlighted some interesting results and associations between concepts that might be worth discussing here. The results can be interpreted in the following three ways:

1. *What are the variables and indicators characterizing both the content and the format of PEM?*
2. *What are the most frequent communication concepts and indicators showing strategic intent that could contribute to higher impact or relevance of printed evidence materials?*

3. *What are the communication concepts or indicators missing in printed evidence materials that eventually could be included to improve their overall impact?*

6.1. Difference between EBPEM

While comparing the effective evidence defined in the second edition of the Cochrane Review (Farmer et al., 2008) and in the future third edition, the first thing that came to mind is the obvious difference in appearance between printed materials. Some documents are shorter than three pages, with colors, different fonts and pictures, while others are longer, without visual elements. This first distinction is more significant than it appears at first sight because it allows separating the printed evidence in two groups, very different in appearance and content.

6.1.1. Quick-references

The evidences defined by Dormuth (2004), Weiss (2011) and Zwarenstein (2007) are no longer than three pages; they have a cover illustration and much more variety in fonts, colors and layout. The illustrations are relevant and facilitate the understanding. Those materials are obviously quick-references for general practitioners or a larger public of health-care providers, and are issued by government or associated institutions. Their language is simpler, and the paragraphs, sentences and phrases are shorter, with less medical jargon. Usually, quick-references do not mention the names of the authors and their bibliographical list is short, up to 10 titles. Most important, the evidence they contain seems to be less robust, less detailed and older. For that reason, we called them “soft-evidence”.

Soft-evidence seems to possess more value in terms of usefulness. The notion of time is implicitly addressed in the laconic messages advising, in three sentences, what should be the goals of the therapy, and in the short tables with the most necessary information about medications. Soft-evidence seems to be more focused on cost-effectiveness – in almost all the quick-references there is a mention on the cost of drugs or procedures in order to avoid unnecessary spending. They use more learning aids via “road signs”, in form of FAQ, or explicit subtitles, to facilitate the reading and remind where the evidence is leading to.

Also, they are fast-paced and often adopt a commanding or vibrant tone which seems important to communicate some affective meaning to people (Peter, 2011). The recommendations are clear; the authors have no doubt about the efficiency of what they are recommending. The reader feels that the certainty of the author and the appropriateness of the recommended behavior.

6.1.2. Peer-reviewed Evidence-based Publications and Guidelines

All the clinical trials, guidelines, meta-analytical studies, etc. seem to be mostly longer, in black and white and much more conservative in style and appearance. Published by renowned scientific journals and independent research organizations, they target a highly educated public of researchers and specialists in the medical field.

The first and most important characteristic of those publications is that the evidence data they contain is robust - this is why we called them “hard-evidence”. It is the result of extensive research, thorough

methodology and analysis, coherent trial procedure and scientific value and meets the criteria established by the CONSORT 2010 checklist of information to include when reporting a randomized trial (Moher et al., 2010). All of the “hard-evidence” has those sections and corresponds to the previous criteria.

Another characteristic of the “hard-evidence” is the excellence of its summaries and reviews.

Quality abstracts and reviews are important for efficient peer-reviewed evidence based documents, because readers often miss the key points upon first exposure without a summary (Doak, 1996; Newhauser, 2011). The summary in the beginning is essential in order to explain the most important points, resume the content about the recommended behavior and suggest appropriate approaches. The first few sentences or moments of communication might be the only chance to share key messages and to do the follow up with more details and information because some of readers might want to go further and get more information (Zwanziger, 2011).

“Hard-evidence” is also often “validated” by the background of the source of the evidence: renowned scientists and specialists are important in order to introduce innovations in organizations or government. Physicians who report similar attitudes toward some new evidence are more likely to exchange information and advice first through collaborative relationships, within a field of specialization or in affiliation with hospital sites, and organizational clinical directorates (Katz, 1957; Mascia et al., 2011).

Another characteristic of the “hard-evidence” is the relative risk reduction, which is used in 70% of the evidence materials we assessed. Relative risk reduction is considered a subjective way to express numbers and relations, and its presence in documents that pretend to be the epitome of objectivity, is interesting. In any case, it certainly represents another way to express risk reduction graphics with apparently higher numbers.

Mostly, the topics of hard-evidence have a higher degree of threat than the topics of soft evidence. While this is good for behavior adoption because it seems to increase the cognitive processing of warnings (Witte, 2000; Andrews, 2011), the articles seem to downplay the danger, at least in appearance: the only expressions used were 'primary outcomes' as a substitute for fatal myocardial infraction, and secondary outcome as combined cardiac disease, stroke, angina, heart failure etc. Still, the seriousness of the tone and the implicit seriousness of danger are present.

Hard evidence has a high degree of novelty which according to Bandura (2001) increases the perception of risk as a factor promoting the recommended behavior. The correlation between the novelty and the extent of opinion change is also noted by Murphy et al. (1998) and Ajzen (1972). This increases, at least in theory, its adoption by people. If the first group to adopt is the innovators, for the sake of novelty, the next to adopt are the early adopters, a group including opinion leaders, who adopt because of appraisal of the innovation's attributes. The opinion leaders are those who will convince the large majority to adopt (an imitative effect). These motivations and time of adoption are related to and can be predicted by each adopter's structural position in the network of relations that tie the social system together

(Kerckhoff, Back, & Miller, 1965). In the medical network, this is very important, because the role and point of view of opinion-leaders is decisive in case of indecision or unclear situation on certain therapies. Katz (1957) study shows clearly the importance of those expert opinion-leaders - they possess what Tarde (1902) would call “value-credit”.

Other than having more value as novelty, hard-evidence also has longer lists of references and cites more renowned authors, which adds to its credibility. This will add to the acceptance of the novelty, because physicians with report similar attitudes toward evidence are more likely to exchange information and advice first through collaborative relationships, then within a field of specialization or in affiliation with hospital sites, and organizational clinical directorates (Katz, 1957; Mascia et al., 2011).

Another common feature of hard evidence is the visibility of the disease – it increases the impact of the intervention and heightens people's vulnerability to collective drama (Babrow, 2011; Toussignant 2005). The “hard-evidence” materials are all on topics, such as cardiovascular diseases, hormone therapy, depression etc. Also, some trials challenge the medical perception of some diseases – we have to mention the ALLHAT, WHI, MIRACL etc., trials. WHI for instance triggered a polemic on the use of HTR in a world where it was ‘the “standard-of-care” that every post- menopausal woman be given replacement hormones for the rest of her life unless there is a medical reason not to; to practice otherwise may be considered malpractice.’ (Genius et al., 2005).

Those trials changed prescription practices and probably refocused public attention on the topic they discuss. It is difficult to decide if hard-evidence was written around visible topics or whether it was the hard-evidence that became the center of attention with the questions it raised. One thing is certain: visibility, novelty and degree of threat seem to be intertwined concepts. It seems logical that health subjects that are highly visible because of their prevalence, such as cardiac diseases, cancer, diabetes or because they are “celebrity” diseases such as R. Reagan Alzheimer, become the focal point of attention of society. The more dangerous the disease and debilitating the condition, the more people it will scare. It is only natural that people, researchers included, get interested and write about this new danger, for all sorts of reasons. High visibility and high threat triggers a higher response.

On the other side, a new study, such as those recently published by the media, about the regeneration of the spinal cord (BBC), will raise all sorts of questions because of its novelty, and become highly visible. The innovation, just as Tarde (1902) predicts, raises all sorts of imitation, as “imitative rays” that will trigger new inventions and new imitations.

The Evaluation grid allows to establish a direct link between some of the above-mentioned indicators. Almost all (19 out of the 21) peer-reviewed evidence-based materials represent novelty of some sort (it is difficult to determine exactly if they triggered a renewal in interest, or if they were written on “hot topics”). On the opposite side, only three quick-references represent a novelty. As far as visibility is concerned, 20 “hard-evidence” materials are written on highly visible subjects, compared to less than half of the soft-evidence articles concern visible subjects. Concerning the Degree of the threat, there is a similar pattern – almost all, 19, peer-reviewed materials (compared to less than half of the quick-references) are on subjects with a high degree of threat, coronary disease, hip replacement, pediatric

surgery etc. All this suggests a link that deserves to be explored further. The data shows that the three indicators of the concept of risk seem directly related and, logically, it seems that the increase of one will trigger the increase of the other two.

6.2. Common Concepts and Indicators that Might Be Correlated to Efficiency

6.2.1. Form

All the documents are well formatted, the text is in chunks delimited with clear white space and organized with subtitles. The EBPEM have exhaustive, well detailed and elaborated captions and explanations for the lists, tables and charts. The fonts are contrasted, easy to read and they represent a visual path for the reader. All the documents use well italics and capitals, following the standards for references and titles. There is not excessive bolding, capitalizing or italicizing (Doak et al., 1996, 2002).

Mostly, the peer-reviewed evidence based publications and the guidelines are using serif font, Times New Roman 12, which is appropriate for longer documents, meant to be consulted on paper. The quick references use Arial sans serif, which, along with the shortness of the documents, suggests a possible online use. The pages of those documents are shorter and allow a comfortable view on screen. Also, all the evidences give detailed and pertinent explanations for the lists, the tables and the charts. Very often, successful evidence uses symbols and interpretations to convey the meaning.

Hard and soft evidences have explicit, well-formulated subtitles. The soft-evidence has of course more variety in the formulation, such as frequently asked questions for the evidence of Dormuth (2004) which

facilitates the understanding. The hard-evidence is more conventional with subtitles such as Analysis, Discussion, Results and Methods. As far as plain language is concerned, almost all the evidence use active voice, but quite often sentences are long, complex and contain embedded information.

6.2.2. Content

One of the characteristics of the effective EBPEM is their clear purpose, limited scope and information is limited to key ideas. All the documents have well defined key ideas that serve as foundation for the clear purpose and scope. The quick references have more general subjects, and give all the important information on the subject in a nutshell. Hard-evidence has a very narrow scope and focuses on precise details; it describes all the outcomes and variables in the technicalities of the trial, which is understandable – the purpose is to trace the way for future research in a specific health question, the level of details provide necessary milestones for future researchers.

6.2.3. Learning Motivation

All the effective evidence corresponds to the experience, logic and language of readers. Of course, the documents intended to be used by general practitioners have less numbers, the language is slightly simpler and the instructions are clearer, giving less choice to readers.

Effective evidence is also an excellent tool for modeling and explaining behaviors: 38 documents give information on appropriate behavior or alert on negative changes (Doak et al., 1996, Newhauser, 2011).

This is particularly true for the guidelines and for the quick references explains the disease, dosage and the behavior to adopt. Even in medical trials, when the document is starting with a hypothesis about a recommended behavior, the possible implications of the therapy are clearly indicated.

6.2.4. Risk

The analyzed material shows the importance of objectiveness while describing risks and responses. This helps the audience decide which of the reasons matter to them (Fischhoff, 2011). What is more important, effective evidence uses “objective risks” resulting from scientific research and experimental studies, in place of “subjective” risks, containing non-expert perceptions of the research. This denotes a highly scientific approach and seems to increase the value-truth (Tarde, 1902) of the evidence. The truth-value of risk is supported with objectiveness and a set of numbers that provide the necessary legitimacy.

The objectiveness is increased by the fact that all the evidence contains limited number of messages making the documents understandable by high and low numeracy audiences Fagerlin (2011) through a simplified decision-making process and less cognitive effort (Peters and colleagues, 2007), improving comprehension and quality choices.

Another element common in effective evidence seems to be the degree of the threat. In a meta-analysis of more than 100 fear appeal articles, Witte and Allen (2002) conclude that “the stronger the fear aroused by a fear appeal, the more persuasive it is” (p. 601). The degree of threat is often highlighted by the

notion of urgency evoked especially in quick-references and guidelines. The link between fear-arousing conditions and message acceptance is direct (Berkowitz, 1962; Sutton, 1980) and increases efficiency of the evidence.

To that, we should add the fact that effective EBPM insist on the danger is a very subtle and non-obtrusive way, in all objectivity. But this is like a tongue in cheek for the medical community to understand the gravity of the situation.

Objectiveness goes hand in hand with standard definitions for the various outcomes, risks and benefits, which is especially important for decision-making, while also increasing risk perception. Standard definitions better the understanding of people with higher numeracy skills and allow simplifying the information for people under stress (Fschhoff, 2011; Fagerlin, 2011), which is important in the case of physicians.

As mentioned before, constant denominators and timeframes (Fagerlin, 2011) are very important to convey objectiveness. Most of the effective evidence, over 70 %, use constant denominators for risks and advantages. Still, we noticed that “hard-evidence” don't use the same denominator for the same outcomes (e.g. one of the results will be expressed in percentage, while a similar result in the same trial will be expressed in 10 000). Another discrepancy in the objectiveness - quick references and peer-reviewed studies use whole numbers in a different way. If the soft-evidence tends to use whole and easier to remember numbers to facilitate the comprehension of readers, hard-evidence tends to illustrate

its tables, charts and graphs with percentages of small fractions (for instance, 0.6% in 100 000) and large denominators. This in a way obscures the fact that the denominator is very small and gives the impression that we are dealing with percentages.

Another positive point for the effective evidence, it enumerates risks in order of importance, in clear order, starting from the most important, giving a clear picture of the issues and priorities. This informs physicians' choice and helps them construct stable preferences, without biased choices. Most of the effective evidence shows clearly the differences between the baseline risk of a side effect (i.e., risk that is present without treatment) and the additional/ incremental risk experienced due to the treatment. Of course, hard-evidence tends to stress the outcomes in side-effects, such as blood pressure, hemodynamic effects etc., which is well aligned with the objectives of the study and is consistent with the attention to detail.

Another point, efficient evidences show the recommended response or behavior as highly effective: people are more likely to respond with a recommended behavior if the response is highly effective. Perceived response efficacy will lead to a quick, sure and efficient decision (Witte, 2002; Young et al., 2006, Ruiters & Kok (2011)). If the physician has also high self-efficacy, he will be more likely to respond with the recommended behavior.

6.2.5. Value of the Evidence

All the messages promote health that increases their value-usefulness. The hard-evidences had a higher level of detail and focuses on one particular aspect of the health condition, while the soft-evidences deal with more general subjects pertaining to the health conditions as a whole. Also, in terms of value-truth, all evidences are endorsed by renowned organizations: the quick-references are officially endorsed by health care departments, while the hard-evidence is endorsed by the background or experience of the source, according to the notion of “valeur-crédit” of Tarde.

Another very important characteristic of the effective evidence is that it does not threaten the self-image of physicians; it does not highlight some deficiency or lack of training in the medical staff or the system. The majority of documents, 38, do not cast any doubt on the system or the competency of doctors. The guidelines are the only documents suggest more education to physicians or a different allocation of resources in the health care system. This can be explained with the role of the guidelines, and also with the scale of their findings and arguments – they treat huge volume of data and findings, the teams working on them are large and they extract every possible meaning of the information, as shown earlier in the section on the scale of the research.

6.3. Missing Communication Indicators and Concepts

The absence of some concepts and indicators is as significant as the presence of others. One of the under-represented indicators in the category of value-truth is the endorsement through disclaimer of interests. Only three hard evidence materials and two soft-evidence material mention it. Quite often, hard-evidence mentions the list of authors and a statement, pointing which authors were sponsored by

pharmaceutical companies and if the trial was sponsored. The absence of disclaimer of interests, in due form, shows that between authors and pharmaceutical companies, there are strong and recognized links of sponsorship.

Another indicator, totally absent, is the cultural diversity, as a cultural meaning of social layering (Geist-Martin et al., 2003) and as a concept used to differentiate different cultural groups in society. We do not consider the data about the diseases of cultural communities as expression of cultural diversity, mostly because it is a part of empirical observations and statistics; it does not take into consideration moral or psychological characteristics associated with race. The notion of cultural diversity might be difficult to integrate in EBPEM that are all about data. Still, in fact the cultural distance between patients and doctors increases, as does the difference between the verbal and non-verbal messages of those groups. As Witte (1995) points out, disregarding this aspect of cultural communication, results in misunderstanding, misconception and poorer healthcare.

Narrative, as personal perspective on things or testimony, is also totally absent from evidences. In making decisions about treatments, physicians are influenced by the stories, advices or experiences of their pairs or by patient's experiences. Still, all the evidences had a very clean and politically correct style in a way.

There are some other indicators that do not appear in the effective evidence. The first is increased easiness of procedures: only two quick references seem to give advices facilitating the daily routines of physicians. There are some other missing indicators: aesthetic advantage to the patient, better

organizations of the environment and moral satisfaction or price for the physician. It is interesting to note that all those indicators refer to a more relaxed, or broader, view of medicine. In a way, it can be connected to the concept of “fast-food” medicine, created by Genius (2005). This concept tends to describe the modern medicine, more concerned with instant relief of symptoms and beautifying of the procedures, than assessing the underlying etiological factors of the disease. The effective EBPEM assessed here, seem to stick more with the traditional view of medicine as an art unconcerned by considerations such as appearance or money.

7. Conclusion

There is growing recognition that theory should play a central role in the design and evaluation of evidence-based interventions. We believe that theory can also be useful for evaluating secondary data analysis – printed evidence-based materials as they are distributed to physicians and as they appear in medical journals.

Using communication theory to evaluate real EBPEM has several advantages over meta-analytical methods. First, this method shows that classification and analysis of evidence-based content can be directed by clear hypotheses suggested by the presence of some communication concepts, as expression of cumulative scientific knowledge. Our analysis was driven by risk communication, Tarde's theory of social values, usability, readability and plain language concepts. We categorized printed materials according to their intended audience, being quick-references or peer-reviewed articles – both groups seem to have distinct characteristics and features. Quick-references are shorter, simpler in language, with more learning aids, and they adopt more often a vibrant, commanding tone. On the other side they contain less robust evidence data, and present less features relative to their value-truth according to Tarde (e.g. the authors are not mentioned). Still, they have more value in terms of value-usefulness and cost-effectiveness

Peer-reviewed evidence-based materials are longer, more conservative in appearance. They contain more robust evidence as a result of extensive research, and strict criteria guiding the creation of their abstract. They have a better value-truth component, because of the background of their source, and the concepts of novelty, visibility and high degree of danger are present in almost all of those materials, which increase their impact on attitude and potential behavior-change.

Second, our approach revealed concepts that are the basis of the theoretical and visual coherence of effective interventions. Other than the clear formatting and form, all of the effective printed evidence-based documents we evaluated, have a clear purpose, limited scope and streamlined messages. Also, they all correspond to the experience, logic and language of readers, and most importantly, they all are an excellent tool for modeling and explaining behaviors.

The concept of risk from risk communication offer a robust theoretical basis for understanding how documents can change physicians' attitude: through objective description of risks and advantages, simplified decision making process, standard definitions for risks and benefits, constant timeframes, enumerating risks in order of importance and clear distinction between baseline and treatment risks. Effective materials show the recommended response as highly effective, thus increasing self-efficacy and affecting the expected reaction from the physician.

Yet we revealed the absence of components in the design of printed interventions, such as endorsement through disclaimer of interest, cultural meaning, narrative, increased easiness of the recommended procedure, better organization of the environment for patients and doctors, and moral satisfaction for doctors. The reasons for absence of those concepts can be further explored and eventually the notions can find place in printed materials in order to increase its impact.

Third, this method of using communication theory to develop and evaluate interventions can provide useful information regarding the applicability of communication theories across different printed material contexts, which can in turn be used to test and better the theory and the replication of concepts.

We believe that this is the first attempt to construct a new framework of communication theory-based constructs to evaluate medical evidence-based printed materials. Moreover, we are not aware of other attempts to assess the reliability with which a framework can be applied on real-life printed documents.

It must be recognized that there are a great number of ways of classifying interventions and intervention functions. The one arrived at here will no doubt be superseded. But for the present, it has the benefits of having been derived from theories already available and therefore covering concepts that have previously been considered to be important to link printed interventions to potential behavioral targets. The most important test of this framework will be whether it provides a more efficient method of choosing the kinds of intervention that are likely to be appropriate for a given behavioral target in a given environment.

Another strength of this Evaluation grid is that it is tested on printed evidence-based materials with proven effectiveness. The documents selected in our sampling were defined by Cochrane collaboration review and researched and selected by joint team of Laval University and Cochrane. They are all materials that changed the recent medical landscape and prescriptive practices. It was unfortunately impossible to take into account the efficiency of materials and to apply this measure objectively to the printed evidence, because of lack of standard measures of efficacy.

Despite this, the particular strength of the Evaluation grid lies in its communication theoretical basis. Each intervention can be categorized and understood in terms of the primary mechanism through which research is intended to have an impact. This also helps elucidate the kinds of impact might be achieved

with different interventions - changing knowledge, understanding and attitudes - or whether they aim to have a more direct, or instrumental, impact on behavior. The Evaluation grid thus has practical as well as conceptual value, because it helps plan and select appropriate strategies for encouraging evidence-informed policy or practice, and in directing attention towards and helping to understand the context of research implementation.

The sampling showed which communication techniques and concepts are predominant in effective evidence and allowed us to retain a wide range of concepts, ranging from appearance and form to content and fundamental concepts. The scope of the Evaluation grid is very large, and this is strength of this framework. Not only it takes into consideration simultaneously various aspects of the printed evidence materials that can predict impact, but it incorporates new elements very naturally in its categories. For instance, illustrations on the cover can easily acquire a value because they are useful or true, especially if they come from a recognized source or if they depict precisely how to perform a medical procedure for instance. This approach draws on a large variety of design and interventions, covers the nature of the desired attitude and suggests a large variety of concepts to be applied simultaneously in order to provoke the desired change.

Evaluating the printed interventions from a communication point of view itself can encourage an increasing awareness and understanding amongst researchers, policy and other decision makers of the importance to presenting the evidence-based information in a better form, enabling them to predict which concepts of those effective materials, such as novelty, visibility, degree of threat, urgency, standard definitions for risks and benefits, etc., are convincing and potentially can provoke the desired behavior.

Having selected the communication function most likely to be effective, more fine-grained specific concepts can be used in a strategy aiming to impact attitude and behavior of physicians. For instance, choosing to increase the value-truth of a document, and therefore its acceptance, would mean adding a disclaimer of interest, names of authors, along with an endorsement from trusted organizations. The communication “mapping” here aims to map theoretical determinants in order to identify potential levers for change. Just by identifying all the potential intervention functions and policy categories this framework could prevent policy makers and intervention designers from neglecting important options. For example, better judgment could be used in choosing more appropriate illustrations for quick-references that will show in a simple way the desired behavior. Some peer-reviewed printed materials could benefit from a more simplified language and structure, so that all the content is comprehensible at first sight, and some documents would have more impact, if they include some form of narrative of patients or doctors to prove the effect or the difficulty of a treatment. However, the systematic way in which the development of the Evaluation grid was approached provides a robust starting point for development of improved communication frameworks.

This first attempt to apply health communication evaluation grid to assess the strategy, or the lack of, in effective printed evidence-based materials, takes into account the form, the content and the underlying theoretical concepts. The model suggested here is new, because it draws from health communication (the previous models suggested were based on psychological theories and on the theory of planned-behavior), and also, because it is one of the rare applications of frameworks on printed materials. In our view, the study can be reproduced and has enough flexibility to integrate more concepts. Evaluating EBPEM from a communication perspective will encourage awareness and understanding of the elements

underlying behavior change. It will allow researchers, policy and decision makers to isolate certain desirable features and the corresponding concepts, predict the outcomes of their interventions and potentially provoke the desired behavior.

7.1. Limitations of the Study

A primary limitation of this study results from our decision to assess printed material instead with proven effectiveness instead of printed materials in genera. Due to limited time and resources, we chose this type of effective sampling in order to understand what works in terms of acceptance. We acknowledge that we could have gained more information about the quality of each document diffused to physicians if we had the resources to obtain and to treat all the materials distributed to different physicians in different contexts.

A second limitation lies in the reported effectiveness of the printed evidence-based materials – the authors define efficiency in different terms, for different periods and for different countries. It is not possible to standardize the effectiveness, which would be the ideal situation. It would be also helpful to have a larger basis of interventions, in order to better validate the analysis.

There is a third possible limitation: the analytical framework was based on some relevant notions and concepts. It did not include other elements that may help to understand other dimensions of the content, particularly some elements associated with the scientific value among others. Still, the Evaluation grid takes into consideration the most important and relevant theories and concepts in the field. This represents a solid basis for future research and allows the integration of new conceptual elements.

And a fourth limitation: judgment is inevitably involved in conceptualizing the underlying theories and in differentiating which are important categories of printed evidence-based interventions. There are many ways of doing this, according to the different circumstances, and there is no guarantee that one is optimal. Further work may be necessary to enable systematic and standardized coding and analysis of concepts. Our approach offers a useful methodological foundation upon which such work could build.

7.2. Future Directions

In systematic reviews, research on evidence-based interventions and on knowledge transfer is based mostly on meta-analytical studies conducted in highly controlled circumstances. The results are based on the conclusions of previous studies and research, which may in turn be based on primary or secondary data. This maximizes the internal validity of the research and, yes, we can see the quintessential information. Still, scholars state the gap between research and clinical practice, somehow disregarding the fact that they remain within the boundaries of this specialized research, and getting further from the basics – the printed evidence-based materials, as they are diffused among physicians, while researchers are stating the difficulties of knowledge transfer. Evaluating those materials, especially from communication perspective, means repositioning the studying lens on the first level information and working with the most appropriate tool for exchange between people.

Further research is needed in order to gain a deeper understanding of trends in evidence-based printed materials. The present study offers just an important reflexive glance at the possibilities to explore that “raw” material.

There is another perspective in the area that needs further research – the content and the form of the evidence-based message. Recently, a lot of studies are evaluating the language, the form and the style of the message from the point of view of usability, readability and plain language. Still, this is only a beginning – the majority of those studies are published in the past two years and they certainly do not cover the entire field.

And of course, the role of health communication in the area of evidence-based uptake and knowledge transfer can be further explored. The fact is that there are few communication studies venturing into the world of evidence-based medicine, and they cover mostly specific areas, such as numeracy or objectiveness of the health information. A more global approach may be needed, probably in conjunction with other disciplines such as psychology, statistics etc., in order to understand why evidence-based knowledge and recommendations are not fully accepted and implemented in practice.

In a more distant perspective, it might be worth prospecting the possibilities to move from print to web based materials that will be available on the “touch of the fingers”. New, more advanced platforms may offer information, user-friendlier and more “specialized” in case of complex medical cases. The technological research is advancing, and it should not remain isolated in the labs.

When we speak about the place of health communication in evidence-based uptake and knowledge transfer, we should not forget its importance of evidence implementation in different cultural and social contexts. Health communication researchers have a primary role in this area and this role cannot but increase.

References

- 111th US Congress, 2nd session. (2010). Plain Writing Act of 2010 (H.R. 946). Washington, DC, Government Printing Office. Retrieved from <http://www.gpo.gov/fdsys/pkg/BILLS-111hr946enr/pdf/BILLS-111hr946enr.pdf>
- Abraham C, Kelly M, Robert W, Michie S. (2009). Public Health Guidance on Behaviour Change. *Psychology, Health & Medicine*, 14:1-8.
- Abraham C, Michie S., (2008). A taxonomy of behavior change techniques used in interventions. *Health Psychol.* 27(3):379-387.
- Ajzen, I. (1971). Attitudinal vs. normative messages: An investigation of the differential effects of persuasive communications on behavior. *Sociometry*, 34, 263-280.
- Ajzen, I. (1977). Intuitive theories of events and the effects of base-rate information on prediction. *Journal of Personality and Social Psychology*, 5, 03-314.
- Ajzen, I. (1982). On behaving in accordance with one's attitudes. In M. P. Zanna, E. T. Higgins & C. P. Herman (Eds.), *Consistency in social behavior: The Ontario Symposium* (Vol. 2, pp. 3-15). Hillsdale, NJ: Erlbaum.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl & J. Beckman (Eds.) *Action-control: From cognition to behavior* (pp. 11- 39). Heidelberg, Germany, Springer.
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology*, 32, 665-683.
- Ajzen, I. (2011). The theory of planned behavior: Reactions and reflections. *Psychology & Health*, 26 (9), 1113-1127.
- Ajzen, I., & Czasch, C., & Flood, M. G. (2009). From intentions to behavior: Implementation intention, commitment, and conscientiousness. *Journal of Applied Social Psychology*, 39, 1356-1372.
- Ajzen, I., & Manstead, A. S. R. (2007). Changing health-related behaviors: An approach based on the theory of planned behavior. In K. van den Bos, M. Hewstone, J. de Wit, H. Schut & M. Stroebe (Eds.). *The scope of social psychology: Theory and applications* (pp. 43-63). New York: Psychology Press.
- ALLHAT Officers and Coordinators for the ALLHAT Collaborative Research Group. (2002). Major outcomes in high-risk hypertensive patients randomized to angiotensin-converting enzyme inhibitor or calcium channel blocker vs. diuretic: The Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT). *JAMA*, 288: 2981-97.
- Andrews, C. (2011). Warnings and disclosures. In Fischhoff, B., Brewer, N., & Downs, J., (editors). (2011). *Communicating Risks and Benefits : An Evidence-Based User's Guide*, US Department of Health and Human Services Food and Drug Administration. Risk Communication Advisory Committee

and consultants, available at <http://www.fda.gov/AboutFDA/ReportsManualsForms/Reports/ucm268078.htm>

Araujo-Soares V, McIntyre T, MacLennan G, Sniehotta F. (2009). Development and exploratory cluster-randomised opportunistic trial of a theory-based intervention to enhance physical activity among adolescents. *Psychology & Health*, 24(7):805-822.

Argo, J.J. and Main, K. J. (2004). Meta-analyses of the effectiveness of warning labels. *Journal of Public Policy & Marketing*, 23 (2), 193-208.

Aro, A., Van den Broucke, S., & Rätty, S. (2005). Toward European consensus tools for inreviewing the evidence and enhancing the quality of health promotion practice. *Promotion & Education*, 12(1), 10-14.

Atkin, C. (1994). Designing persuasive health messages. In L. Secherest, T.Backer. E. Rogers, R.Campbell and M. Grady (Eds.) *Effective dissemination of clinical health information (ACHFR Publication No 95-0015,pp 99-110)* Rockville, MD., Pulibic Health Service, Agency for Health Care and Policy.

Austin, P. C. and M. M. Mamdani (2005). Impact of the pravastatin or atorvastatin evaluation and infection therapy-thrombolysis in myocardial infarction 22/Reversal of Atherosclerosis with Aggressive Lipid Lowering trials on trends in intensive versus moderate statin therapy in Ontario, Canada. *Circulation*, 112(9): 1296-1300.

Austin, P. C., M. M. Mamdani, et al. (2003). Prescriptions for estrogen replacement therapy in Ontario before and after publication of the Women's Health Initiative Study. *JAMA*, 289(24): 3241-3242.

Austin, P. C., M. M. Mamdani, et al. (2004). Changes in prescribing patterns following publication of the ALLHAT trial. *Jama* 291(1): 44-45.

Austin, P. C., M. M. Mamdani, et al. (2004). The impact of the Women's Health Initiative study on incident clonidine use in Ontario, Canada. *Can J Clin Pharmacol* 11(2): e191-194.

Auvray. L., Hensgen, F. & Serment, C. (2003) La diffusion de l'innovation pharmaceutique en médecine libérale : revue de la littérature et premiers résultats français. *Questions d'économie et de santé*, 73.

Babrow, A. & Russell, K. (2011). Risk in the Making: Narrative, Problematic Integration and Social Construction of Risk. *Communication Theory*, 2, 239-260.

Backer T.E. (1991). Knowledge utilization: the third wave. *Knowledge*, 12:255-40

Bae, J., & Jun K. (2008). Information loss, knowledge transfer cost and the value of social relations. *Strategic Organization*, 6(3), 227-258.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52, 1-26.

- Bandura, A. (2004). Health promotion by social cognitive means. *Health Education & Behavior*, 31(2), 143-164. doi:10.1177/1090198104263660
- Bandura, A., (2011). The Social and Policy Impact of Social Cognitive Theory. *Social Psychology and Evaluation*, 32-57.
- Barbaglia, G., F. Macia, et al. (2009). Trends in hormone therapy use before and after publication of the Women's Health Initiative trial: 10 years of follow-up. *Menopause*, 16(5): 1061-1064.
- Bartholomew L, Parcel G, Kok G, Gottlieb N. (2011). *Planning Health Promotion Programs: Intervention Mapping*. San Francisco Jossey-Bass.
- Beckett, M., Quiter, E., Ryan, G., Berrebi, C., Taylor, St., Chi, M., Picus, H. & Kahn, K. (2011). Bridging the Gap Between Basic Science and Clinical Practice. The Role of Organizations in Addressing Clinician Barriers. *Implementation Science*, 6(35).
- Beckman, H. T., Lueger, R. J. (1997). Readability of self-report clinical outcome measures. *Journal of Clinical Psychology*, 53(8): 785–789.
- Berkoff, M., Rijssen J., Schellart, A., Anema, J. & Van der Beek, A. (2011). Effective training strategies for teaching communication skills to physicians: An overview of systematic reviews. *Patient Education and Counseling*, 84, 152-162.
- Berkowitz, L. and Cottingham, D. (1960). The interest value and relevance of fear arousing communications. *Journal of Abnormal and Social Psychology*, 51, 1173-1182.
- Bero LA, Grilli R, Grimshaw JM, et al. (1998). Closing the gap between research and practice: an overview of systematic reviews of interventions to promote the implementation of research findings. The Cochrane Effective Practice and Organization of Care Review Group. *BMJ*, 317: 465–8
- Bish, A., Yardley, L., Nicoll, A., & Michie, S. (2011). Factors associated with uptake of vaccination against pandemic influenza: A systematic review. *Vaccine*, 29(38), 6472-6484.
- Bjornson, D. C., T. S. Rector, et al. (1990). "Impact of a drug-use review program intervention on prescribing after publication of a randomized clinical trial." *Am J Hosp Pharm* 47(7): 1541-1546.
- Black, N. and A. Hutchings (2002). "Reduction in the use of surgery for glue ear: did national guidelines have an impact?" *Qual Saf Health Care* 11(2): 121-124.
- Blais, André (1993). "La mesure". In Gauthier, B. (1993) *Recherche sociale. De la problématique à la collecte des données*, Presses de l'Université du Québec. pp. 175-194.
- Booth, A., (1999). Mapping the evidence base of pathology. *Journal of Pathology*, 188, 344-350.
- Boer H, Seydel E: Protection motivation theory, in Connor M, Norman P (eds.): *Predicting Health Behavior: Research and Practice With Social Cognition Models*. Buckingham, PA, Open University Press, 1996, pp. 95-120.

- Borsika, A., Russell, E., Kerner, J., Klump, P., Brownson, D. (2010). Dissemination and Implementation Research on Community-Based Cancer Prevention: A Systematic Review. *American Journal of Preventive Medicine*, 38(4), 443-456.
- Boutron, I., Moher D, Altman DG, Schulz KF, Ravaud P. (2008). Extending the CONSORT Statement to Randomized Trials of Nonpharmacologic Treatment: Explanation and Elaboration. *Ann Intern Med*, 148:295-309.
- Braunwald, E, Antman, E. M, Beasley JW, et al. (2002). ACC/AHA guideline update for the management of patients with unstable angina and non–ST-segment elevation myocardial infarction. *Circulation*, 106:1893-900.
- Braunwald, E., Antman, E., Beasley, J., Califf, R., Cheitlin, M., Hochman, J., Jones, R., Kereiakes, D., Kupersmith, J., Levin, T., Pepine, K et al. (2002). ACC/AHA 2002 guideline update for the management of patients with unstable angina and non–ST-segment elevation myocardial infarction—summary article: A report of the American College of Cardiology/American Heart Association task force on practice guidelines (Committee on the Management of Patients With Unstable Angina). *J. Am. Coll. Cardiol.* 40;1366-1374
- Brown, M., & Bruhn, M. (2011). In Fischhoff, B., Brewer, N., & Downs, J., (editors). (2011). *Communicating Risks and Benefits : An Evidence-Based User's Guide*, US Department of Health and Human Services Food and Drug Administration. Risk Communication Advisory Committee and consultants, available at <http://www.fda.gov/AboutFDA/ReportsManualsForms/Reports/ucm268078.htm>
- Brown, T. C., Ajzen, I., & Hrubes, D. (2003). Further tests of entreaties to avoid hypothetical bias in referendum contingent valuation. *Journal of Environmental Economics and Management*, 46, 353- 361.
- Brownson R., Fielding J., & Maylahn Ch., (2009). Evidence-based Public Health: A fundamental Concept for Public Health Practice. *Annual Review of Public Health*, 30, 175-201.
- Cacioppo, J., Petty, R., Feinstein, J., Jarvis, W. & Blair, G. (1996). Dispositional differences in cognitive motivation: The life and times of individuals varying in need for cognition. *Psychological Bulletin*, 119(2), 197-253.
- Cannon, C., Braunwald, E., McCabe, C., Rader, D., Rouleau, J., Belder, R., Joyal, St., Hill, K., Pfeffer, M., and Skene, A., (2004). Intensive versus Moderate Lipid Lowering with Statins after Acute Coronary Syndromes, *New England Journal of Medicine*, 350(15)
- Centers for Disease Control and Prevention. (2007). *Best Practices for Comprehensive Tobacco Control Programs*. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.
- Cesario, S., Morin, K. & Donato, A. (2002). Evaluating the Level of Evidence of Qualitative Research. *Jognn Principles & Practice*, (6), 531-538.

Cohen, D., Crabtree, B., Etz, R., et al. (2008). Fidelity versus flexibility: translating evidence-based research into practice. *Am J Prev Med*, 35(5):S381–S389.

Cohn, J., Archibald, D., Ziesche, S., Franciosa, J., Harston, J., Tristani, F., Dunkman, B., Jacobs B., Francis, G., M.D., Flohr, K., Goldman, St., Cobb, Fr., Shah, Pr., Saunders, R., Fletcher, R., Loeb, H., Hughes, V., Baker, B. (1986). Effect of Vasodilator Therapy on Mortality in Chronic Congestive Heart Failure, *New England Journal of Medicine*, 314:1547-1552

Coleman, J., Katz, E., & Menzel, H. (1957). The Diffusion of an Innovation Among Physicians. *Sociometry*, 20(4). 253-270.

Communication Policy of the Government of Canada (2006). Retrieved from <http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?id=12316§ion=text>

Coulter, I., Khorsan, R., Crawford, C., & Hsiao, A. (2010). Integrative Health Care Under Review: An Emerging Field. *Journal of Manipulative and Physiological Therapeutics*. 11-12. 690-710.

Craig P, Dieppe PA, Macintyre S, Michie S, Nazareth I, Petticrew M. (2008). Developing and evaluating complex interventions: the new Medical Research Council guidance. *BMJ*, 337:979-983.

Cunningham-Sabo, L., Carpenter, W., Peterson, J., Anderson, L., Helfrich, Ch., Davis, S. (2007). Utilization of Prevention Research: Searching for Evidence. *American Journal of Preventive Medicine*. 33(1). S9-S20

Dahlof, B., Devereux, R.B., Kjeldsen, S.E., Julius, S., Beevers, G., de Faire, U., Fyhrquist, F., Ibsen, H., Kristiansson, K., Lederballe-Pedersen, O., Lindholm, L.H., Nieminen, M.S., Omvik, P., Oparil, S., Wedel, H. (2002). LIFE Study Group. Cardiovascular morbidity and mortality in the Losartan Intervention For Endpoint reduction in hypertension study (LIFE): a randomised trial against atenolol. *Lancet*, 359: 995–1003

Daigle, J. J., Hrubes, D., & Ajzen, I. (2002). A comparative study of beliefs, attitudes, and values among hunters, wildlife viewers and other outdoor recreationists. *Human Dimensions of Wildlife*, 7, 1-19.

David Moher, D, Hopewell, S., Schulz, K., Montor, V., Gøtzsche, P., , Devereaux, P.J., Elbourne, D., Eggerh, M., Altman, D. (2010). CONSORT 2010 Explanation and Elaboration: updated guidelines for reporting parallel group randomised trials. *Journal of Clinical Epidemiology*, 63, e1-e37.

Davidson KW, Goldstein M, Kaplan RM, Kaufmann PG, Knatterud GL, Orleans CT, Spring B, Trudeau KJ, Whitlock EP. (2003). Evidence-based behavioral medicine: what is it and how do we achieve it? *Ann Behav Med*, 26(3):161-171.

Davis, L. E., Ajzen, I., Saunders, J., & Williams, T. (2002). The decision of African American students to complete high school: An application of the theory of planned behavior. *Journal of Educational Psychology*. 94, 810-819.

de Bruin M, Viechtbauer W, Hospers HJ, Schaalma HP, Kok G. (2009). Variability in standard care quality of HAART-adherence studies: implications for the interpretations and comparison of intervention effects. *Health Psychol*, 28(6):668-674.

de Leeuw, E. (2011). Theory and policy innovation for health: Where has the creativity and fun gone? *Health Promotion International*, 26(1), 1-3. doi:10.1093

Dearing, J. (2009). Applying diffusion of innovation theory to intervention development. *Research on Social Work Practice*. 19(5), 503-518. doi:10.1177/1049731509335569

Dearing, J. W., & Kreuter, M. W. (2010). Designing for diffusion: How can we increase uptake of cancer communication innovations? *Patient Education and Counseling*, 81, S100-S110.

Doak, C., Doak, L., & Root, J. (1996). *Teaching Patients with Low Literacy Skills*, Retrieved from <http://www.hsph.harvard.edu/healthliteracy/resources/doak-book/index.html>.

Doak, Cecilia C., Leonard G. Doak, and Jane H. Root. (1996). *Teaching patients with low literacy skills*. Second edition. Philadelphia: Lippincott. (Available at: <http://www.hsph.harvard.edu/healthliteracy/resources/doak-book/>).

Doak, L., et Doak, C., (Eds.). (2002). *Pfizer Health Literacy Principles: A Handbook for Creating Patient Education Materials that Enhance Understanding and Promote Health Outcomes*. Available at <http://www.pfizerhealthliteracy.com>

Doak, C.C., Doak, L.G., Root, J.H. (1996). *Teaching Patients with Low Literacy Skills*: Philadelphia: JB Lippincott. Available at <http://www.hsph.harvard.edu/healthliteracy/resources/doak-book/index.html>

Dohan, D., & Levintova, M. (2007). Barriers beyond words: Cancer, culture, and translation in a community of russian speakers. *Journal of General Internal Medicine*. 22(2), 300-305.

Donner A, Eliasziw M. (2002). A goodness-of-fit approach to inference procedures for the kappa statistic: confidence interval construction, significance-testing and sample size estimation. *Stat Med*, 11:1511-1519.

Donohew, L. (1994). Attention, Need for Sensation and Health Communication Campaigns. *American Behavioral Scientist*. 38:2

Donohew, L., Lorch, E., Palmgreen, P., Rogus, M., Helm, D., Grant, N. (1991). Sensation Seeking, Message Sensation Value, and Drug Use as Mediators of PSA Effectiveness. *Health Communication*, 3(4). 217-227.

Donohew, L., Palmgreen, P., (2006). Effective Mass Media Strategies for Drug Abuse Prevention Campaigns, in *Handbook of Drug Abuse Prevention, Part II*, 27-43.

Dopson, S., Locock, L., Gabbay, J., Ferlie, E., & Fitzgerald, L. (2003). Evidence-based medicine and the implementation gap. *Health*. 7(3), 311-330.

Dormuth, C. R., M. Maclure, et al. (2004). Effect of periodic letters on evidence-based drug therapy on prescribing behaviour: a randomized trial. *CMAJ*, 171(9): 1057-1061.

Downs, S. (2011). In Fischhoff, B., Brewer, N., & Downs, J., (editors). (2011). *Communicating Risks and Benefits : An Evidence-Based User's Guide*, US Department of Health and Human Services Food and Drug Administration. Risk Communication Advisory Committee and consultants, available at <http://www.fda.gov/AboutFDA/ReportsManualsForms/Reports/ucm268078.htm>

Elasty TA, Ellis SE, Brown A, Pichert JW. (2003). A taxonomy for diabetes educational interventions. *Patient Education and Counselling*, 43:121-127.

Ernst, R., & Yett, D. (1984). Review article : Physicians' background characteristics and their career choices: A review of the literature. *Medical Care Research and Review*, 41(1), 1-36.

Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults. (2001). Executive summary of the third report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III). *JAMA*, 285:2486– 2497

Fagerlin, A., Zikmund-Fisher, B.J, Ubel, P. (2011) Helping patients decide: Ten steps to better risk communication, *JNCI J Natl Cancer Inst* (2011) 103(19): 1423

Farmer AP, Légaré F, Turcot L, Grimshaw J, Harvey E, McGowan J, Wolf FM. (2011). Printed educational materials: effects on professional practice and health care outcomes. *The Cochrane Collaboration*, 11.

Fischhoff, B., Brewer, N., & Downs, J., (editors). (2011). *Communicating Risks and Benefits : An Evidence-Based User's Guide*, US Department of Health and Human Services Food and Drug Administration. Risk Communication Advisory Committee and consultants, available at <http://www.fda.gov/AboutFDA/ReportsManualsForms/Reports/ucm268078.htm>

Fischhoff, B., Watson, S., & Hope, C. (1984). Defining risk. *Policy Sciences*, 17, 123-139.

Fishbein, M., & Ajzen, I. (1981). Attitudes and voting behaviour: An application of the theory of reasoned action. In G. M. Stephenson & J. M. Davis (Eds.), *Progress in applied social psychology*. Vol. 1, pp. 95-125. London: Wiley.

Fixsen, D., Blase, K., Naoom, S., & Wallace, F. (2009). Core implementation components. *Research on Social Work Practice*, 19(5), 531-540.

Fonarow, G. C., W. J. French, et al. (2009). Trends in the use of lipid-lowering medications at discharge in patients with acute myocardial infarction: 1998 to 2006. *Am Heart J* 157(1): 185-194.

Frenk J., Chen L., Bhutta Z.A., Cohen J., Crisp N., Evans T., Fineberg H., Zurayk H.(2010). Health professionals for a new century: Transforming education to strengthen health systems in an interdependent world. *The Lancet*, 376 (9756), 1923-1958.

Gagnon, M., Godin, G., Gagné, C., Fortin, J., Lamothe, L., Reinharz, D., & Cloutier, A. (2003). An

adaptation of the theory of interpersonal behaviour to the study of telemedicine adoption by physicians. *International Journal of Medical Informatics*, 71(2-3), 103-115.

Gardner, B., Whittington, C., McAteer, J. & Michie, S. (2010). Using theory to synthesise evidence from behaviour change interventions: the example of audit and feedback. *Social Science & Medicine*, 70(10):1618-1625.

Geist-Martin, P., Ray, E.B., & Sharf, B.F., (2003). Understanding health in cultural communities. In P. Geist-Martin, B. Ray and B. Sharf. *Communicating health: personal, cultural and political complexities*, (p. 54-94), Belmont, CA., Wadsworth Thompson Learning.

Gill, J., Mainous, A., Koopman, R., Player, M., Everett, Ch., Chen, Y., Diamond, Lieberman, M. (2011). Impact of EHR-Based Clinical Decision Support on Adherence to Guidelines for Patients on NSAIDs: A Randomized Controlled Trial. *Annals of Family Medicine*, 9(1).

Glanz, K., & Bishop, D. B. (2010). The role of behavioral science theory in development and implementation of public health interventions. *Annual Review of Public Health*, 31, 399-418. doi:10.1146/annurev.publhealth.012809.103604

Glanz, K., Rimer, B.K. & Lewis, F.M. (2002). *Health Behavior and Health Education. Theory, Research and Practice*. San Francisco: Wiley & Sons.

Glasgow, R. E., & Emmons, K. M. (2007). How can we increase translation of research into practice? types of evidence needed. *Annual Review of Public Health*, 28, 413-433.

Glasner-Edwards S, Rawson R. (2010). Evidence-based practices in addiction treatment: review and recommendations for public policy. *Health Policy*. 97(2-3):93-104.

Grady D, Herrington D, Bittner V, et al. (2002). Cardiovascular disease outcomes during 6.8 years of hormone therapy. *JAMA*. 288:49-57.

Graham, S., & Weiner, B. (1996). Theories and principles of motivation. In D. C. Berliner & R. C. Calfee (Eds.). *Handbook of educational psychology*. 63-84. New York: Simon & Schuster Macmillan.

Green, L. W., Ottoson, J. M., García, C., & Hiatt, R. A. (2009). Diffusion theory and knowledge dissemination, utilization, and integration in public health. *Annual Review of Public Health*, 30, 151-174.

Green, L.W. (2001). From Research to “Best Practices” in Other Settings and Populations. *American Journal of Health Behavior*, 25 (3), 165-178(14)

Greenhalgh T, Robert G, Macfarlane F, Bate P, Kyriakidou O. 2004. Diffusion of innovations in service organizations: systematic review and recommendations. *Milbank Quarterly*, 82(4).

Milbank Q. 82:581–629 Norman, C., & Skinner, H. (2006). eHealth Literacy: Essential Skills for Consumer Health in a Networked World, *J Med Internet Res.*, 8(2)

Griffin, E. (2000). A first look at communication theory (4th ed.). Boston, MA: McGraw-Hill. N/A

Grimshaw J, Eccles M, Thomas R, MacLennan G, Ramsay C, Fraser C, Vale L. (2006), Toward evidence-based quality improvement. Evidence (and its limitations) of the effectiveness of guideline dissemination and implementation strategies. *Journal of General Internal Medicine*, 21 (2). 14-20.

Grimshaw, R., Thomas, R., MacLennan, G., & al., (2004). Effectiveness and efficiency of guideline dissemination and implementation strategies, *Health Technologies*, 8(6).

Groaj. S., Libin, A., Lauderdale, M., Kroll, Th., DeJong, G., & Hsieh, J., (2009). Beyond the Evidence-Based Practice Paradigm to Achieve Best Practice in Rehabilitation Medicine; A Clinical Review., *American Academy of Physical Medicine and Rehabilitation*, 1, 941-950.

Grol, R., Grimshaw, J. (2003). From best evidence to best practice: effective implementation of change in patients' care, *The Lancet*, 362(9391). 1225-1230.

Guay, M. P., A. Dragomir, et al. (2007). Changes in pattern of use, clinical characteristics and persistence rate of hormone replacement therapy among postmenopausal women after the WHI publication. *Pharmacoepidemiology and Drug Safety* 16(1): 17-27.

Diabetes in Ontario: An ICES Practice Atlas Toronto, Institute for Clinical Evaluative Sciences; 2003:(in press).

Haas, J. S., C. P. Kaplan, et al. (2004). Changes in the use of postmenopausal hormone therapy after the publication of clinical trial results. *Ann Intern Med* 140(3): 184-188.

Hammond, D. (2009, February). Tobacco Labelling & Packaging Toolkit: A Guide to FCTC Article 11. University of Waterloo, Department of Health Studies, 1-132.

Hammond, J.S., Keeney, R.L., and Raiffa, H. (1999). *Smart Choices*. New York: Broadway. A how- to guide focused on identifying and defining decision outcomes, grounded in decision analysis and behavioral research.

Harold Tan Boon, K. (2006). Clinical practice guidelines: a critical review. *International Journal of Health Care Quality Assurance*, 19(2), 195-220.

Harrington, N. G., Lane, D. R., Donohew, L., & Zimmerman, R. S. (2006). An extension of the Activation Model of Information Exposure: The addition of a cognitive variable to a model of attention. *Media Psychology*, 8, 139-164.

Harter, L., Japp, Ph., Beck, Ch. (Eds.). (2005). *Narratives, Health, and Healing*. Communication theory, research and practice. Routledge series

Hersh, A. L., M. L. Stefanick, et al. (2004). National use of postmenopausal hormone therapy: annual

trends and response to recent evidence.[see comment]. JAMA.291(1):47-53, 2004 Jan 7.(1): 47-53.

Higgins, J.P.T., Green, S, eds. Cochrane Handbook for Systematic Reviews of Interventions 4.2.5 [updated May 2005]. <http://www.cochrane.org/resources/handbook/hbook.htm>. Accessed April, 2012.

Hill, E., Alpi, K. & Auerbach. M.(2010). Evidence-based Practice in Health Education and Promotion. A Review and Introduction to Ressources. Health Promotion Practice.11(3), 358-366.

Hise, M., Kattelman, K., & Parkhurst, M.(2005). Evidence-Based Clinical Practice: Dispelling the Myths. Nutr Clin Pract. 20: 294-302

Hrubes, D., Ajzen, I., & Daigle, J. (2001). Predicting hunting intentions and behavior: An application of the theory of planned behavior. Leisure Sciences, 23, 165-178.

Hulley S., Grady, D., Bush, T., Furberg, C., Herrington, D., Riggs, B., et al. (1998). Randomized trial of estrogen plus progestin for secondary prevention of coronary heart disease in postmenopausal women. JAMA. 1998;280:605-13. [PMID: 9718051]

Huntley-Fenner, G., (2011). In Fischhoff, B., Brewer, N., & Downs, J., (editors). (2011). Communicating Risks and Benefits : An Evidence-Based User's Guide, US Department of Health and Human Services Food and Drug Administration. Risk Communication Advisory Committee and consultants, available at <http://www.fda.gov/AboutFDA/ReportsManualsForms/Reports/ucm268078.htm>

Imperial Cancer Research Fund OXCHECK Study Group. (1995). Effectiveness of health checks conducted by nurses in primary care: final results of the OXCHECK study. Implementation Science, 3:11. |

Institute of Medicine. (2004). Health literacy: A Prescription to End Confusion. Washington DC: National Academy Press; 2004.

Isetta, M., (2008)., Evidence-based practice, healthcare delivery and information management. A contemporary case study. Aslib Proceedings: New Information Perspectives, 60(6), 619-661.

Jackevicius, C. A., G. M. Anderson, et al. (2001). Use of the statins in patients after acute myocardial infarction: does evidence change practice? Arch Intern Med. 161(2): 183-188.

Jensen. M., Trollope-Kumar. K., Waters, H., Everson. (2008). Building physician resilience. Can Fam Physician. 54(5): 722–729.

Janis, I.L. and Feshbach, S. (1953). Effects of fear-arousing communications. Journal of Abnormal and Social Psychology, 48 (1), 78-92.

Jolly K, Bradley F, Sharp SM, Smith H, Thompson S, Kinmonth AL, Mant D. (1999). Randomised controlled trials of follow up care in general practice of patients with myocardial in Journal of Health Psychology , 9:85-98.

Julius, S., Kjeldsen, S.E., Weber, M., Brunner, H., Ekman, S., Hansson, L., Hua, T., Laragh, J., McInnes,

G.T., Mitchell, L., Plat, F., Schork, A., Smith, B., Zanchetti, A. (2004). VALUE trial group. Outcomes in hypertensive patients at high cardiovascular risk treated with regimens based on valsartan or amlodipine: the VALUE randomised trial. *Lancet*, 363: 2022–31

Juurlink, D. N., M. M. Mamdani, et al. (2004). Rates of hyperkalemia after publication of the Randomized Aldactone Evaluation Study.[see comment]. *New England Journal of Medicine*. 351(6):543-51, 2004 Aug 5.(6): 543-551.

Kabir, Z., J. Feely, et al. (2007). Primary care prescribing patterns in Ireland after the publication of large hypertension trials. *Br J Clin Pharmacol* 64(3): 381-385.

Kaiserfledt, Thomas. (2006). Review of Theories of Invention and Innovation, Working Paper Series in Economics and Institutions , Royal Institute of Technology, CESIS - Centre of Excellence for Science and Innovation Studies.

Kanfer FH, Goldstein AP. (1986). Helping people change: a textbook of methods. 3rd edition. Oxford: Pergamon.

Katz, E., (1999). Theorizing Diffusion: Tarde and Sorokin Revisited. *AAPPS*, 56.

Katz, E., Coleman, J., Menzel, H. (1957). The Diffusion of an Innovation Among Physicians, *Sociometry*, 20 (4).

Kees, J., Burton, S., Andrews, J.C., and Kozup, J. (2010). Understanding how graphic pictorial warnings work on cigarette packaging. *Journal of Public Policy & Marketing*, 29 (2), 265-276.

Kerner, J., & Hall, K. (2009). Research dissemination and diffusion. *Research on Social Work Practice*, 19(5), 519-530.

Knott, J., & Wildavsky, A. (1980). If dissemination is the solution, what is the problem ? *Science Communication*, 1(4), 537-578.

Kohatsu N., Robinson, J., Torner, J., (2004). Evidence-based public health. An evolving concept. *American Journal of Preventive Medicine*. 27(3).

Kok G, Schaalma H, Ruiter R, Van Empelen P, Brug J. (2004). Intervention mapping: protocol for applying health psychology theory to prevention programmes. *J Health Psychol* 2004, **9**:85-89

Kottke, T. E., M. L. Brekke, et al. (1989). A randomized trial to increase smoking intervention by physicians. *Doctors Helping Smokers, Round I. JAMA*, 261(14): 2101-2106.

Kruglanski, A. W., & Ajzen, I. (1983). Bias and error in human judgment. *European Journal of Social Psychology*, 13(1), 1-44.

- Kutner, M., Greenberg, E., & Baer J. (2005). *National Assessment of Adult Literacy (NAAL): A First Look at the Literacy of America's Adults in the 21st Century*, Washington DC: US Department of Education, National Center for Education Statistics.
- Lakoff, A., Petryna, A. & Kleinman A., (editors). 2006. *Global Pharmaceuticals: Ethics, Markets, Practices*. Duke University Press.
- Lazzarato, M. (2002). *Puissances de l'invention. La psychologie économique de Gabriel Tarde contre l'économie politique, Les empêcheurs de penser en rond, Le Seuil, Paris.*
- Lam, N. N., A. K. Jain, et al. (2009). Results of a randomized controlled trial on statin use in dialysis patients had no influence on statin prescription. *Kidney Int* 76(11): 1172-1179.
- Landis, J., & Koch, G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33, 159–174.
- Lavis, J., Davies, H., Oxman, A., Denis, J., Biddle & Ferlie E., (2005). Towards systematic reviews that inform health care management and policy-making. *Journal of Health Services Research & Policy*.
- Latour, B. & Lépinay, V. (2009). *The Science of Passionate Interests: An introduction to Gabriel Tarde's Economic Anthropology*. Prickly Paradigm Press, LLC. Chicago.
- Leatherman. Sh. & Warrick. L., (2008). Effectiveness of Decision Aids: A Review of the Evidence. *Medical Care Research and Review*, 65 (6), 79S-116S.
- Lomas, J. (1991). Words without action? the production, dissemination, and impact of consensus recommendations. *Annual Review of Public Health*, 12(1), 41-65.
- Lowe, D., Ryan, R., Santesso S., Hill, S. (2011). Development of a taxonomy of interventions to organise the evidence on consumers' medicines use. *Patient Education and Counseling*. 85, e101–e107.
- Madden, T., Ellen, P., & Ajzen, I. (1992). A comparison of the theory of planned behavior and the theory of reasoned action. *Personality and Social Psychology Bulletin*, 18(1), 3-9.
- Majumdar, S. R., E. A. Almasi, et al. (2004). Promotion and prescribing of hormone therapy after report of harm by the Women's Health Initiative. *JAMA* 292(16): 1983-1988.
- Majumdar, S. R., F. A. McAlister, et al. (2003). Synergy between publication and promotion: comparing adoption of new evidence in Canada and the United States. *Am J Med* 115(6): 467-472.
- Malenka DJ, Baron JA, Johansen S, Wahrenberger JW, Ross JM. The framing effect of relative and absolute risk. *Journal of General Internal Medicine*. 1993;8(10):543-548.
- Martha Mitchell Funnell M. (2010). Peer-based behavioural strategies to improve chronic disease self-management and clinical outcomes: evidence, logistics, evaluation considerations and needs for future research. *Family Practice Advance Access*, 27(i17-i22).

- Mascia, D., Cicchetti, A., Fantini M., Gianfranco, D., Ricciardi, W. (2011). Physicians' propensity to collaborate and their attitude towards EBM: A cross-sectional study. *BMC Health Services Research*, 11(1), 172-180.
- Mason, J., N. Freemantle, et al. (1998/9). "The effect of distribution of Effective Health Care Bulletins on prescribing selective serotonin reuptake inhibitors in primary care." *Health Trends* 30: 120-122.
- Mason, J., N. Freemantle, et al. (2001). Impact of effective health care bulletin on treatment of persistent glue ear in children: time series analysis. *BMJ* 323(7321): 1096-1097.
- Masuda, J., Robinson, K., Elliott, S., & Eyles, J. (2009). Disseminating chronic disease prevention "to or with" canadian public health systems. *Health Education & Behavior*, 36(6), 1026-1050.
- McKenna, H., Ashton, S., & Keeney, S. (2004). Barriers to evidence based practice in primary care: A review of the literature. *International Journal of Nursing Studies*, 41(4), 369-378.
- McLaughlin, G. H. SMOG Readability Formula. Retrieved from: <http://www.harrymclaughlin.com/SMOG.htm>
- McNeil, B.J., Weichselbaum, M.D. and Pauker, S.G. (1978). Fallacy of the five-year survival rate in lung cancer. *New England Journal of Medicine*, 289, 1397-1401.
- Michie S, Johnston M, Francis J, Hardeman W, Eccles M. (2008). From theory to intervention: mapping theoretically derived behavioural determinants to behaviour change techniques. *Applied Psychology An International Review*, 57(4)
- Michie, S. van Stralen, M., & Robert West, R., (2011). The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science*, 6(42). 1-11.
- Michie, S., Abraham, C. (2008). Advancing the science of behaviour change: a plea for scientific reporting. *Addiction*, 103:1409-1410.
- Michie, S., Abraham, Ch., Eccles, M., Hardeman, W., Johnson, M.. (2011). Strengthening evaluation and implementation by specifying components of behaviour change interventions: a study protocol. *Implementation Science*. 6:10
- Michie, S., Abraham, Ch., Whittingham, C., McAteer, J., Gupta, S. (2009). Effective Techniques in Healthy Eating and Physical, *Health Psychology*. 28(6).690–701.
- Michie, S., Johnston, M. Abraham, C., Lawton, R., Parker, D., Walker, A and on behalf of the "Psychological Theory" Group. (2005). Making psychological theory useful for implementing evidence based practice: a consensus approach. *Psychological theory and evidence based practice*,14(1): 26–33.
- Michie, S., M Johnston, C Abraham, R Lawton, D Parker, A Walker, Schifter, D. E., & Ajzen, I. (1985). Intention, perceived control, and weight loss: An application of the theory of planned behavior. *Journal of Personality and Social Psychology*, 49, 843-851.

Michie, S., Prestwich, A., & de Bruin, M. (2010). Importance of the nature of comparison conditions for testing theory-based interventions: Reply. *Health Psychology, 29*(5), 468-470. doi:10.1037/a0020844

Miller, N.E. & Dollard, J. (1941). *Social Learning and Imitation*. New Haven, CT: Yale University Press.

Mitchell R., Parker V., Giles M., White N. (2010). Toward realizing the potential of diversity in composition of Interprofessional health care teams: An examination of the cognitive and psychosocial dynamics of Interprofessional collaboration. *Medical Care Research and Review, 67* (1). 3-26.

Mitchell, S. A., Fisher, C. A., Hastings, C. E., Silverman, L. B., & Wallen, G. R. (2010). A thematic analysis of theoretical models for translational science in nursing: Mapping the field. *Nursing Outlook, 58*(6), 287-300. doi:10.1016/j.outlook.2010.07.001

Morris, D.B. (2001). *Narratives, Ethics, and Pain: Thinking With Stories*. Narrative-Columbus-Ohio, 9(1), 55-77.

Mosca L, Banka CL, Benjamin EJ, Berra K, Bushnell C, Dolor RJ, Moumjid. N., Gafni, A., Bremond, A., Carrere M., (2007). Shared Decision Making in the Medical Encounter: Are We All Talking about the Same Thing? *Medical Decision Making, 9*, 539-546.

Mullen, P., & Ramirez G., (2006). The Promise and Pitfalls of Systematic Reviews. *Annual Review Public Health, 27*, 81-102.

Napoll, M. (2011). Improvements in abstracts and plain language summaries needed. <http://www.cochrane.org/news/blog/improvements-abstracts-and-plain-language-summaries-needed>

National Institut for Clinical Excellence. (2000). *Guidance on the Selection of Prostheses for Primary Total Hip Replacement. Technology Appraisal Guidance 2.*

Nendaz, M., (2011). Éducation et qualité de la decision médicale: un lien fondé sur des preuves existe-t-il? *La revue de médecine interne. 32*, 436-442.

Nissen SE, Tuzcu EM, Schoenhagen P, Brown BG, Ganz P, Vogel RA, Crowe T, Howard G, Cooper CJ, Brodie B, Grines CL, DeMaria AN, for the REVERSAL Investigators. Effect of intensive compared with moderate lipid-lowering therapy on progression of coronary atherosclerosis: a randomized controlled trial. *JAMA. 2004;291:1071–1080.*

Nissen, S.E., Wolski, K. (2007). Effect of rosiglitazone on the risk of myocardial infarction and death from cardiovascular causes. *New Engl J Med, 356: 2457–2471.*

Nissen, St., Tuzcu, E., Schoenhagen, P., Brown, G., Ganz, P., Vogel, R., Crowe, T., Howard, G., Cooper, C., Brodie, B., Grines, C. and DeMaria, A. (2004). Effect of Intensive Compared With Moderate Lipid-Lowering Therapy on Progression of Coronary Atherosclerosis. A Randomized Controlled Trial. *JAMA, 291*(9).

O'Keefe, D.J., & Jensen, J.D. (2007). The relative-persuasiveness of gain-framed loss-framed messages for encouraging disease prevention behaviors. A meta-analytical review. *Journal of Health*

Communication International Perspectives, 12, 623.

Osborne H. (2005). *Health Literacy from A to Z: Practical Ways to Communicate Your Health Message*. Sudbury, Mass: Jones and Bartlett Publishers.

Patel, V., Yoskowitz, N., Arocha, J. & Shortlife. E., (2008). Cognitive and learning sciences in biomedical and health instructional design: A review with lessons for biomedical informatics education. *Journal of Biomedical Informatics*, 42, 176-197.

Peters E, Dieckmann NF, Dixon A, Hibbard JH, Mertz CK. Less is more in presenting quality information to consumers. *Medical Care Research and Review*. 2007;64(2):169-190.

Pedersen, Terje; Kjekshus, J; Berg, K; Haghfelt, T; et al . (1994). Randomised trial of cholesterol lowering in 4444 patients with coronary heart disease: the Scandinavian Simvastatin Survival Study (4S). *The Lancet*, 344, 8934.

Peters, E., Dieckmann, N.F., Västfjäll, D., Mertz, C.K., Slovic, P., and Hibbard, J. (2009). Bringing meaning to numbers: The impact of evaluative categories on decisions. *Journal of Experimental Psychology: Applied*, 15, 213–227.

Petryna, A., Lakoff, A., & Kleinman A. (eds.). 2006. *Global Pharmaceuticals. Ethics, Markets, Practices*. Durham, NC, Duke University Press. 301 p.

Pitt, B., Zannad, F., Remme, W.J, et al. (1999). The effect of spironolactone on morbidity and mortality in patients with severe heart failure. *N Engl J Med.*, 341:709-17.

Pitt, B., Zannad, F., Remme, W. J. ,et al. (1999). The effect of spironolactone on morbidity and mortality in patients with severe heart failure. *N Engl J Med*. 341:709 –717.

Rabin, B. A., Glasgow, R. E., Kerner, J. F., Klump, M. P., & Brownson, R. C. (2010). Dissemination and implementation research on community-based cancer prevention. *American Journal of Preventive Medicine*, 38(4), 443-456. doi:10.1016/j.amepre.2009.12.035

Ray, M.L. and Wilkie, W.L. (1970). Fear: The potential of an appeal neglected by marketing. *Journal of Marketing*, 34 (1), 34-62.

Reyna, V. F., Nelson, W., Han, P., & Dieckmann, N. F. (2009). How numeracy influences risk comprehension and medical decision making. *Psychological Bulletin*, 135, 943-973

Rogers, E.M. *Diffusion of innovations* (3rd ed.) New-York: The Free Press.

Rogers, N., Mewborn, CR. (1976). Fear appeals and attitude change: effects of a threat's noxiousness, probability of occurrence, and the efficacy of coping responses. *J Pers Soc Psychol.* 34(1):54-61.

Rohrbach, L., Grana, R., Sussman, S., & Valente, T. (2006). Type II translation. *Evaluation & the Health Professions*, 29(3), 302-333.

- Rotheram-Borus, M. J., Ingram, B. L., Swendeman, D., & Flannery, D. (2009). Common principles embedded in effective adolescent HIV prevention programs. *AIDS and Behavior*, 13, 387-398.
- Rootman, I., & Gordon-El-Bihbety, D., (2008). A Vision for a Health Literate Canada: Report of the Expert Panel on Health Literacy. Canadian Public Health Association
- Rousseau, N., McColl, E., Newton, N., Grimshaw, J., Eccles, M. (2003). Practice based, longitudinal, qualitative interview study of computerised evidence based guidelines in primary care, *BMJ*, 326 : 314.
- Rosswurm, M. A., & Larrabee, J. (1999). A model for change to evidence-based practice. *Image: Journal of Nursing Scholarship*, 31 , 317–322.
- Rudd, R. E., Anderson, J. E., Oppenheimer, S., and Nath, C. (2007). Health literacy: An update of public health and medical literature. In J. P. Comings, B. Garner, & Smith, C. (Eds.), *Review of Adult Learning and Literacy* (vol. 7) Mahwah, NJ: Lawrence Erlbaum Associates.
- Ruiter, R. and Kok, G. (2011) Planning to frighten people? Think again! in C. Abraham, and M. Kools (eds), *Writing Health Communication: An Evidence-Based Guide*. London: Sage.
- Ruzek, J. I., & Rosen, R. C. (2009). Disseminating evidence-based treatments for PTSD in organizational settings: A high priority focus area. *Behaviour Research and Therapy*, 47(11), 980-989.
- Rycroft-Malone, J. (2006). The politics of the evidence based practice movements. *Journal of Research in Nursing*, 11(2), 95-108.
- Rye, C., & Kimberly, J. (2007). Review: The adoption of innovations by provider organizations in health care. *Medical Care Research and Review*, 64(3), 235-278.
- Salmon, C.T. & Atkin, C. (2003) Using media campaigns for health promotion. In T.L. Thompson, A.M. Dorsey, K.I. Miller and R. Parrott (Eds.). *Handbook of health communication* (pp. 515-535). Mahwah, N.J. Lawrence Erlbaum Associates.
- Schulz, K., Altman, D., Moher, D. (2010). CONSORT 2010 Statement: updated guidelines for reporting parallel group randomised trials. *BMC Medicine*, 8(18).
- Schunk, D. H., & Pajares, F. (2002). The development of academic self-efficacy. In A. Wigfield & J. Eccles (Eds.), *Development of achievement motivation*. 16-31. San Diego: Academic Press.
- Schuster, R., Tasosa, J., Terwoord, N. (2008). Translational research – implementation of NHLBI obesity guidelines in a primary care community setting: the physician obesity awareness project. *Journal of Nutrition, Health & Aging*. 12 (10). 764S-768S.
- Schwartz, G.G., Olsson, A.G., Ezekowitz, M.D., et al. (2001). Effects of atorvastatin on early recurrent ischemic events in acute coronary syndromes: the MIRACL study: a randomized controlled trial. *JAMA*, 285: 1711-8.
- Schwitzer, G. (2011). in Fischhoff, B., Brewer, N., & Downs, J., (editors). (2011). *Communicating Risks and Benefits : An Evidence-Based User's Guide*, US Department of Health and Human Services Food and Drug Administration. Risk Communication Advisory Committee and consultants.

- Scott, W. (1990). Innovation in medical care organizations: A synthetic review. *Medical Care Research and Review*, 47(2), 165-192. doi:10.1177/107755879004700203
- Shah, B. R., D. N. Juurlink, et al. (2008). New use of rosiglitazone decreased following publication of a meta-analysis suggesting harm. *Diabetic Medicine*, 25(7): 871-874.
- Smith, J., Allen J, Blair, S et al. (2006) AHA/ACC guidelines for secondary prevention for patients with coronary and other atherosclerotic vascular disease: 2006 update: endorsed by the National Heart, Lung, and Blood Institute. *Circulation*, 113: 2363-72.
- Solomon, M., (2000). The rhetoric of dehumanization. An Analysis of Medical Reports of the Tuskegee Syphilis Project. In Reverby, S. (Ed.) *Tuskgee's truths: Rethinking the Tuskgee syphilis study*, Chapel Hill: University of North Carolina Press pp. 251-265.
- Sontag, S. (2001). *Illness as Metaphor and AIDS and Its Metaphors*. Picador, USA.
- Stafford, R. S., C. D. Furberg, et al. (2004). Impact of clinical trial results on national trends in alpha-blocker prescribing, 1996-2002. *Jama* 291(1): 54-62.
- Steinman M. & Baron, R. (2007). La formation médicale continue est-elle un outil de promotion pharmaceutique. *Canadian Family Physician*, 53, 155-168.
- Stephenson, M. & Southwell, B., (2006), Sensation Seeking, the Activation Model, and Mass Media Health Campaigns: Current Findings and Future Directions for Cancer Communication, *Journal of Communication*, 56:S38–S56
- Street, R., Wheeler, E., & McCaughan, W. (2000). Specialist-primary care provider-patient communication in telemedical consultations. *Telemedicine Journal*, 6(1), 45-54.
- Sudsawad, P., (2007). Knowledge Translation: Introduction to Models, Strategies and Measures. The National Center for the Dissemination of Disability Research.
- Sutton, A., Higgins, J., (2008). Recent developments in meta-analysis. *Statistics in medicine* 27:625–650.
- Sutton, S. R. (1982). Fear-arousing communications: A critical examination of theory and research. In J.R. Eiser (Ed.), *Social Psychology and Behavioral Medicine*, Chichester, UK: John Wiley & Sons Ltd., 303-337.
- Tang, J. & Griffiths. S., (2009). Epidemiology, Evidence-Based Medicine and Public Health. *Asia-Pacific Journal of Public Health*. 21(3), 244-251.
- Tarde, G. 1902/2006. *Psychologie économique*. Tome premier, Félix Alcan, Éditeur (publié en 1902). Accessible dans le cadre de la collection: "Les classiques des sciences sociales" (Université du Québec à Chicoutimi): http://classiques.uqac.ca/classiques/tarde_gabriel/psycho_economique_t1/psycho_economique_t1.pdf

Tarde, G. 1890/1993. Les lois de l'imitation. Deuxième édition, 1895. Réimpression, Paris: Kimé Éditeur, 1993, 428 pages. Accessible dans le cadre de la collection: "Les classiques des sciences sociales" (Université du Québec à Chicoutimi):

http://classiques.uqac.ca/classiques/tarde_gabriel/lois_imitation/lois_imitation.html

Tarde, G. 1902/2006. Psychologie économique. Tome second, Félix Alcan, Éditeur (publié en 1902). Accessible dans le cadre de la collection: "Les classiques des sciences sociales" (Université du Québec à Chicoutimi): http://classiques.uqac.ca/classiques/tarde_gabriel/psycho_economique_t1/psycho_economique_t2.pdf

Tarde, G. (1973). Écrits de psychologie sociale, choisis et présentés par A. M. Rocheblave-Spenlé et J. Millet. Toulouse : Édouard Privat, Éditeur, 202 pp. Collection : Rhadamanthe.

The Heart Outcomes Prevention Evaluation Study Investigators. (2000). Effects of an angiotensin-converting-enzyme inhibitor, ramipril, on cardiovascular events in high-risk patients. *N Engl J Med.* 342:145–153.

Therapeutics Initiative. (1994). Definitive treatment of peptic ulcer disease by eradication of *H. pylori*. *Therapeutics Letter*, 2 (20).

Therapeutics Initiative. (1994). Treatment of gastro-esophageal reflux disease (GERD). *Therapeutics Letter*, 13(11).

Therapeutics Initiative. (1994). Treatment of non-ulcer dyspepsia in adults: common questions about H2-blockers. *Therapeutics Letter*, 1(19).

Therapeutics Initiative. (1995). Anti-infective guidelines for community acquired infections. *Therapeutics Letter*, 5(12).

Therapeutics Initiative. (1995). Drugs of choice in the treatment of hypertension, part 1. *Therapeutics Letter*, 7(23).

Therapeutics Initiative. (1995). Drugs of choice in the treatment of hypertension, part 2. *Therapeutics Letter*, 8(24).

Therapeutics Initiative. (1995). Medical management of ischemic heart disease — the optimal use of nitrates. *Therapeutics Letter*, 6(22).

Therapeutics Initiative. (1995). Should we be using NSAIDs for the treatment of osteoarthritis and “rheumatism”? *Therapeutics Letter*, 4 (21).

Therapeutics Initiative. (1995). To sleep or not to sleep. Here are your questions. *Therapeutics Letter*, 11(25).

Therapeutics Initiative. (1996). Menopausal hormone therapy. *Therapeutics Letter*, 14(27)

Therapeutics Initiative. (1997). Management of anxiety disorders in primary care. *Therapeutics Letter*, 18(29).

Therapeutics Initiative. (1997). Medical management of benign prostatic hyperplasia. *Therapeutics Letter*, 19(5).

Therapeutics Initiative. (1995). Changing concepts in the management of asthma. *Therapeutics Letter*, 12(26).

Therapeutics Initiative. Review and update 1995. *Therapeutics Letter*, 9 (13).

Toussignant, M., Mishara, B., Caillaud, A., Fortin, V. & St-Laurent, D., (2005). The impact of media coverage of the suicide of a well-known Quebec reporter: the case of Gaetan Girouard. *Social Science & Medicine*, 60, 1919–1926

University of Leeds, School of Public Health. (1992). The treatment of persistent glue ear in children. *Effective Health-care Bulletin*, 4.

University of Leeds, School of Public Health. (1993). Treatment of depression in primary care. *Effective Health-care Bulletin*, 5.

US Department of Health and Human Services, Centers for Disease Control and Prevention (CDC). (2006). Simply Put. Retrieved from http://www.cdc.gov/healthmarketing/pdf/Simply_Put_082010.pdf.

US Department of Health and Human Services, Centers for Medicare & Medicaid Services. (2010). Toolkit for Making Written Material Clear and Effective. Retrieved from <http://www.cms.gov/WrittenMaterialsToolkit>.

US Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2010). Quick Guide to Health Literacy. Retrieved from <http://www.health.gov/communication/literacy/quickguide/>.

US Department of Health and Human Services, Office of Disease Prevention and Health Promotion. (2010b). National Action Plan to Improve Health Literacy. Retrieved from: http://health.gov/communication/HLActionPlan/pdf/Health_Literacy_Action_Plan.pdf

US Federal Plain Language Guidelines. (March 2011). Available at <http://www.plainlanguage.gov/howto/guidelines/bigdoc/TOC.cfm> (www.plainlanguage.gov).

Valente, T. W. (2007). Networks and public health: A review of network epidemiology: A handbook for survey design and data collection. *Social Networks*, 29(1), 154-159.

Virgilio, R., Chiapa, A. & Palmarozzi, E. (2007). Evidence-Based Medicine, Part 1. An Introduction to Creating an Answerable Question and Searching the Evidence, *Journal of American Osteopathic Association*, 107(8).

vonWinterfeldt, D., and Edwards, W. (1986). *Decision Analysis and Behavioral Research*. New York: Cambridge University Press.

Walter, I., Nutley, S., Davies, H., (2003). Developing a taxonomy of interventions used to increase the impact of research, <http://www.ruru.ac.uk/PDFs/Taxonomy%20development%20paper%20070103.pdf>. Accessed April 1, 2012.

Wang, Y. R., G. C. Alexander, et al. (2005). Lack of effect of guideline changes on LDL cholesterol reporting and control for diabetes visits in the U.S., 1995-2004. *Diabetes Care* 28(12): 2942-2944.

Wanner, C., Krane, V., Marz, W. et al. (2005) Atorvastatin in patients with type 2 diabetes mellitus undergoing hemodialysis. *N Engl J Med*. 353: 238–248.

Watson, M., D. Gunnell, et al. (2001). Guidelines and educational outreach visits from community pharmacists to improve prescribing in general practice: a randomised controlled trial. *J Health Serv Res Policy* 6(4): 207-213

Weiss, K., R. Blais, et al. (2011). Impact of a Multipronged Education Strategy on Antibiotic Prescribing in Quebec, Canada. *Clin Infect Dis*. 20 (1).

Wheildon, C. (2005). *Type & layout: Are you communicating or just making pretty shapes*. With additional material by Geoffrey Heard. Victoria, Victoria, Australia: The Worsley Press.

Witte, K. & Morrison. K. (1995). Intercultural and cross-cultural health communication. In R.L. Wiseman (Ed.) *Intercultural communication theory* (pp. 216-246). Newbury Park, CA, Sage Publishing.

Wolf, M. S., Davis, T.C., Tilson, H.H., Bass III, P. F., and Parker, R. M. (2006). Misunderstanding of prescription drug warning labels among patients with low literacy. *American Journal of Health- System Pharmacy*, 63(11):1048-55.

Woolf St., DiGuseppi C., Atkins, D., and Kamerow. D. (1996). Developing evidence-based clinical practice guidelines. Lessons learned by the US Preventive Services Task Force. *Annual Review Public Health*. 17.511-538.

World Health Organisation. Risk communication. Available at <http://www.who.int/foodsafety/micro/riskcommunication/en/index.html>

Wright, S. (2001). Contribution of a lecturer-practitioner in implementing evidence based health care. *Clinical Effectiveness in Nursing*, 5, 30-34.

Wright, P. (2011). Using graphs effectively in text. In Ch. Abraham & M. Kools (eds.). *Writing Health Communication. An Evidence-Based Guide*. London. Sage publications. 63-83.

Writing Group for the Women's Health Initiative Investigators. (2002). Risks and Benefits of Estrogen Plus Progestin in Healthy Postmenopausal Women. Principal Results From the Women's Health Initiative Randomized Controlled Trial. *JAMA*, 288 (3). 288:321–333.

Young, H. N., Bell, R. A., Epstein, R. M., Feldman, M. D., and Kravitz, R. L. (2006). Types of information physicians provide when prescribing antidepressants. *Journal of General Internal Medicine*, 21, 1172-1177.

Zikmund-Fisher B, Fagerlin A, Ubel P. Improving understanding of adjuvant therapy options via simpler risk graphics. *Cancer*. 2008;113(12):3382-3390.

Zwarenstein, M., J. E. Hux, et al. (2007). The Ontario printed educational message (OPEM) trial to narrow the evidence-practice gap with respect to prescribing practices of general and family physicians: a cluster randomized controlled trial, targeting the care of individuals with diabetes and hypertension in Ontario, Canada. *Implementation Science* 2: 37.

Warneryd, K., (2008). The psychological underpinnings of economics: Economic psychology according to Gabriel Tarde. *The Journal of Socio-Economics* 37, 1685–170.

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