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Advanced Healthcare Services Enabled by a Computerized Pain Body Map

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Abstract

Pain Body Maps are promising tools for patients with advanced cancer. We briefly present Computerised Pain Body Maps from the literature, and contrast them with our own CPBM specifically designed for this patient group. Furthermore, we ponder the fact that current CPBMs do not really offer any more functionality than the paper PBMs, but show how a fully-functioning CPBM system is a prerequisite to many innovations in pain management.

Keywords: pain body map, CPBM, cancer pain, patient-centered design, clinical tools

1. Introduction

A Computerised Pain Body Map (CPBM) is a digital version of a pain body map, a drawing of the human body that can be used by a patient to mark pain ("this is where it hurts"). A number of CPBMs have been proposed in recent years, but none of them seem to have documented very well how they have been developed or how they have involved patients and clinicians in the process, and none of them have been developed for patients with advanced cancer disease.

In this paper we describe the development of a new CPBM for patients with advanced cancer. Our CPBM has explicitly involved patients and clinicians in an iterative manner, and tests indicate that it is perceived as useful by both target groups. We show that although the CPBM does not strictly speaking offer any significantly new features when compared to a paper PBM, a functioning CPBM system is a prerequisite to a multitude of new functionality for managing pain in this patient group.

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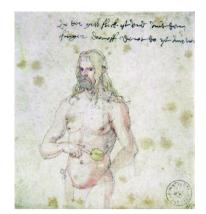*E-mail address:* ellen.jaatun@ntnu.no

Fig. 1. The Sick Dürer.

The remainder of this paper is structured as follows: In Section 2 we present background information on pain body maps used in clinical practice. We present our own CPBM in Section 3, and outline new possibilities in Section 4. We discuss our findings in Section 5, and offer our conclusions in Section 6.

2. Background

Pain is a subjective experience, and is one of the most common reasons for patients to see a doctor. During the conversation with the physician, the patient is faced with the challenge of explaining the details about the pain experience; such as where it hurts, the quality of pain, temporal pattern and pain interference. This detailed description depends on the patient's knowledge of anatomy as well as ability to produce an accurate description of the painful experience. This conversation is partly challenged by the lack of a common language to describe the pain. Thus, a precise pain drawing may aid this conversation substantially.

2.1. Paper Pain Body Maps

Pain Body Maps (PBMs) have been used for decades as a diagnostic aid to pain management. The 16th century German painter Albrecht Dürer may have been the first to employ a drawing of the human body to indicate location of pain when he in a letter made a self portrait (see Fig. 1) annotated by a yellow mark and the text "the yellow spot shows where I hurt" (paraphrased)[1].

In more recent times, PBMs have been a part of the most frequently used questionnaires for assessing pain; the Edmonton Symptom Assessment System (ESAS)[2] and the Brief Pain Inventory (BPI)[3]. PBMs have been validated for use with most patients, and have also shown good inter-rater reliability for healthcare professionals[4].

For clinical decision making, information on pain location, intensity, distribution and temporal factors may provide important information to the physician. All this information can be presented and extracted from a pain drawing.

2.2. Computerised Pain Body Maps

Table 1 lists different projects involving development and/or testing of CPBMs. A general observation is that most of the studies are qualitative exploratory studies. Only one study has used a quantitative study design[5]. From this we can conclude that the concept is not fully explored, and a consensus to design has not been established.

None of the other studies in Table 1 have described their test participants properly in terms of how the disease affects their abilities to interact with the tool. Two studies have included cancer patients[6,8]. Additionally, only one study[10] has explicitly reported development involving actual patients. However, through testing in the qualitative studies, interaction problems related to patients' disability or design flaws have been reported. One study recommends natural drawing behaviour based on test results[7]. This is also the implicit strategy of the other studies.