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### How to measure chronic pain: New concepts



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The assessment of chronic pain and its impact on physical, emotional and social functions requires the use of multidimensional qualitative and health-related quality of life instruments, but there is still little agreement concerning what these may be or which approach to adopt. Increasing focus on patient-reported outcomes in medicine has had the positive effect of giving prominence to the views and experiences of patients with chronic pain, and the ecological momentary assessment (EMA) approach allows patients' symptoms to be assessed in their natural environment in real time without the need for recall. Computerised EMA symptom diaries are now generally regarded as the 'gold standard' in the field of pain medicine, and they have recently attracted increasing attention as an essential component of health-care monitoring systems based on the information and communication technology. A web/Internet-based diary and patient terminal seem to provide a ubiquitous, easy-to-use and cost-efficient solution for patient-centred data acquisition. In addition, telemonitoring is increasingly seen as an effective means of supporting shared decision-making as it can inform patients about typical symptoms, treatment options and prognosis, and it is widely accepted as an additional source of information. This article reviews some of the instruments used to assess chronic pain, including newly developed and well-established validated multidimensional instruments and health-care monitoring systems based on information and communication technology, and it discusses their advantages and limitations.

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## Introduction

Not only is chronic pain a symptom of rheumatic disease but it may also be a disease in itself in which the biomedical disorder only partially explains a broader biopsychosocial context [1]. This is especially true when pain is perceived in multiple body regions as in the case of chronic widespread pain (CWP) [1]. Patients with CWP are frequently encountered in clinical practice, but their assessment can be a formidable challenge because of the wide range of possible diagnoses including rheumatological, endocrine/metabolic, neurological, infectious, malignant and psychiatric disorders [1], and the findings of population-based studies in the USA and UK suggest that the symptom is experienced by 10–11% of the population at any given time [2,3].

One of the manifestations of CWP is fibromyalgia (FM), a complex multifactorial disorder characterised by persistent widespread pain and mechanical hyperalgesia, and it is often accompanied by a number of associated symptoms such as fatigue, sleep disturbances, psychological and cognitive alterations, headache, migraine, variable bowel habits, diffuse abdominal pain and urinary frequency [4,5].

This review considers the methodological issues relating to the clinimetric properties of a number of instruments currently used to assess patients with chronic musculoskeletal pain, including newly developed and well-established validated multidimensional instruments and health-care monitoring systems based on information and communication technology, and it discusses their advantages and limitations. It is based on an extensive search of the literature, and the knowledge and experience of the authors. Although it makes no claim to be exhaustive, it may offer some useful recommendations for everyday clinical practice.

## Chronic pain assessment

The comprehensive assessment of any chronic complex pain condition should be based on a biopsychosocial model that also considers the interactions of biological, psychological and social/cultural contributors to the experience of pain [1,5–7]. Pain assessment is an interactive and collaborative process involving patients and their families, nurses, physicians and other health professionals, which provides the basis for selecting the most appropriate treatment. The foundation of effective chronic pain management includes interviews, physical assessments, reviews of medications and medical and surgical procedures, a psychosocial review, a review of the patient's physical environment and appropriate diagnostic investigations. Its aim should be to determine the duration, frequency, intensity/severity, location, onset pattern, quality or character of the pain, its impact on the quality of life of the patient and his/her family and the effectiveness of treatments. Self-reporting is the primary source, and it facilitates regular reassessment and follow-up. Various uni- or multidimensional pain measurement scales have been developed, but none of them is suitable for all patients, and using them interchangeably is still not justified [6,8,9].

### *Unidimensional pain scales*

In busy clinical settings, pain measures must be simple, quick to administer and easily understood by patients, and unidimensional scales satisfy all of these requirements as they can be administered several times with minimal administrative effort, and they provide rapid results [6,9]. Subjective methods for measuring pain intensity include verbal rating scales (VRS), visual analogue scales (VAS) and numeric rating scales (NRS), all of which have proved to be reliable and valid [10–12]; however, they are significantly different from each other in terms of the number of response categories, patient and clinician preferences, the likelihood of missing data and administration requirements.

A VRS consists of a set of words that describe the intensity/severity of pain along a continuum from 'no pain' to 'mild pain', 'moderate pain', 'severe pain', 'extreme pain' and 'worst possible pain' (Fig. 1a). Patients are asked to select the word that best describes the characteristics of their pain. A VRS helps patients to describe their pain more accurately by providing frequently used words, but the fact that

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