Pain assessment $3 \times 3$: a clinical reasoning framework for healthcare professionals

Abstract

Objectives: To give an overview of central aspects of pain medicine-specific clinical reasoning when assessing a pain patient. Clinical reasoning is the thinking and decision-making processes associated with clinical practice.

Methods: Three core pain assessment areas that are crucial for clinical reasoning in the field of pain medicine are discussed, each of them consisting of three points.

Results: First, it is important to distinguish acute, chronic non-cancer, and cancer-related pain conditions. This classical and very simple trichotomy still has important implications treatment-wise, e.g., concerning the use of opioids. Second, the pain mechanism needs to be assessed. Is the pain nociceptive, neuropathic, or nociplastic? Simply put, nociceptive pain has to do with injury of non-neural tissue, neuropathic pain is caused by a disease or lesion of the somatosensory nervous system, and nociplastic pain is believed to be related to a sensitized nervous system (c.f. the concept of "central sensitization"). This also has implications concerning treatment. Some chronic pain conditions are nowadays viewed more as diseases rather than the pain being merely a symptom. In the new ICD-11 pain classification, this is conceptualized by the characterization of some chronic pains as "primary". Third, in addition to a conventional biomedical evaluation, psychosocial and behavioral aspects must also be assessed, the pain patient being viewed as an active agent and not merely as the passive recipient of an intervention. Hence, the importance of a dynamic bio-psycho-social perspective. The dynamic interplay of biological, psychological, and social aspects must be taken into account, putative behavioral “vicious circles” thereby being identified. Some core psycho-social concepts in pain medicine are mentioned.

Conclusions: The clinical applicability and clinical reasoning power of the $3 \times 3$ framework is illustrated by three short (albeit fictional) case descriptions.

Keywords: assessment; clinical reasoning; neuropathic; nociceptive; nociplastic; pain.

Introduction

Pain, which traditionally is divided into acute, chronic and cancer-related [1–3], is highly prevalent. Pain is the primary complaint seen in primary care [4]; every fifth adult person in the general population suffers from chronic pain [5]; two out of three patients with advanced cancer are in pain [6]; and 44–78% of hospital patients have experienced pain in the preceding 24 h [7]. Hence, assessing pain should be viewed as a core clinical capability. Yet, assessing pain is often considered difficult, perhaps in no small part due to its subjective nature. Moreover, pain patients are sometimes considered to be “difficult” as they can arouse negative emotions in health care professionals [8].

Assessing pain correctly is essential for the implementation of an effective and safe treatment strategy [9]. But how should pain be assessed? In the English-speaking literature, there are acronyms aiming at facilitating the obtaining of a thorough patient pain history, e.g. COLDERAS (character, onset, location, duration, exacerbating, relieving, radiation, associated symptoms and severity), or WILDA (words to describe pain, intensity, location, duration, aggravating and alleviating factors) [4, 9]. Important as they are, such aids do not help the physician in his or her clinical reasoning. Clinical reasoning is the thinking and decision-making processes associated with clinical practice [10]. The “acid test” of a pain assessment is not merely its thoroughness. Instead, the key question is whether the pain assessment is permeated by adequate clinical reasoning. Being thorough in taking a pain history, examining the patient, and using different tests and questionnaires – all of this is essential, but it is only the first step. Arguably, what
really matters is the ensuing act of clinical judgement, i.e., it is the “putting it all together” that really counts.

What factors are important for clinical reasoning when meeting a pain patient? The aim of the present paper is to propose a framework that equips physicians and other health care personnel with “tools” to make an informed judgement of the patient’s situation. The framework can also help clinicians check that their clinical pain conclusions contain the basic ingredients of a well-reasoned pain assessment. It is important to understand that the “3 × 3 framework” that is here presented (summarized in Table 1) is not an alternative to acronyms such as COLDERAS or WILDA. Rather, it is a framework designed to encapsulate some core perspectives that should underly the whole process of clinical reasoning when meeting a pain patient. By evaluating three areas, each of which has three components (hence 3 × 3), it is argued that clinicians will be better equipped for making well-grounded clinical decisions concerning pain patients. The three areas are, in themselves, more or less undisputed in the field of pain medicine, and all three are important (hence, one should not choose between the three areas – all three have to be used). Hence, the originality of the present paper does not lie in the parts that are presented. Rather, its value lies in the synthesis of information and in the claim that the presented three areas are at the core of clinical reasoning in pain medicine. Of course, this proposal is open to debate, and the author is well-aware of the complicated and multi-facetted nature of pain assessments. It must also be stressed that the framework assumes that an ordinary medical assessment is made, i.e., the framework is about what is special for pain patients, not what is common to all patients. For instance, nothing will be said about making a thorough physical examination of the patients, or about the importance of ordinary etiological thinking, and the like.

**Acute, chronic, or cancer-related?**

The first area consists of ascertaining if the pain is acute, chronic, or cancer-related [1–3]. This may seem simplistic indeed. In all its simplicity, however, this triad is important treatment-wise, e.g. concerning the question of when to prescribe opioids. After acute tissue trauma, for instance after major surgery, a short treatment period with opioids is often justified and uncontroversial. But the longer the time that has passed after the trauma, the more the indication to use opioids decreases. Opioid treatment in the transition between acute post-surgery pain and chronic pain can be a difficult area, and the introduction of so-called transitional pain services has been proposed in this context [11, 12].

In chronic pain conditions, opioids are generally not recommended. Simply put, chronic pain is often more a disease in its own right rather than merely a symptom of something else [13, 14]. Chronic pain is “the result of neural mechanisms gone awry” [15], and in such cases opioids are often inappropriate – both because of lack of efficacy and because of risks and side-effects. The purpose of the present paper is not to introduce these difficult issues, which are discussed in detail elsewhere [16–18]. The point here is simply to underline the importance of time when assessing whether or not it is appropriate to prescribe opioids. Needless to say, time is far from the only aspect – but it is an important one. Simply put: The longer the duration of pain, the lesser the likelihood that opioids will help the patient and the higher the likelihood that opioids will cause problems. However, opioids “remain a treatment option for some selected patients with chronic non-cancer pain under careful surveillance” (my emphasis) [16].

Cancer-related pain is traditionally considered a category of its own. The World Health Organization (WHO) analgesic ladder from 1986, with strong opioids as the third and final step, had “freedom from cancer pain” as an explicit goal [19]. The ladder was part of a broad program aimed at improving strategies for cancer pain management through educational campaigns, the creation of shared strategies, and the development of a global network of support [20]. The WHO analgesic ladder can be viewed as an important step away from the period of opiophobia inaugurated by the Poisons and Pharmacy Act in Great Britain in 1908 and the Harrison Act in the USA in 1914 [21]. Of course, the opioid epidemic that was unleashed in the USA around the turn of the millennium signified the death of opiophobia and the victory of what has been termed opiophilia [22] or opiocentrism [23]. In many parts of the world however, opiophobia still prevails, leading to a strange paradox: in some parts of the world, people die because of opioid overprescribing; in other parts of the world people die in needless pain because of the lack of basic opioid-based pain relief.

In 1996, WHO wrote that, for cancer patients having advanced disease, “the only realistic treatment option is pain relief and palliative care” [19]p.v. Having advanced cancer was in many ways more or less synonymous with end-of-life care, and therefore the word “chronic” applied best to non-

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Table 1: Overview of the pain assessment 3 × 3 framework.
cancer patients. Hence, it made sense to view cancer-related pain as a major category within pain medicine, cancer-related pain being seen as radically different from both acute pain and chronic non-cancer pain. A quarter of century later, oncology has made tremendous progress, and advanced cancer is no longer synonymous with imminent end-of-life care. The concept of “cancer survivors” is crucial here, and it is important to understand that there is an overall “blurring of previous lines of distinction in treatment strategies”, not least as “cancer evolves into a chronic illness” [24]. The distinction between cancer-related pain and chronic non-cancer pain, although medically still useful in many ways, is not as clear-cut as it used to be.

**Nociceptive, neuropathic, or nociplastic?**

The two major goals of a pain assessment are assessing the pain burden and assessing pain mechanisms [25]. The pain burden will be discussed in the next section, the present section being about pain mechanisms, i.e., it is about the importance of characterizing the pain as nociceptive, neuropathic, or nociplastic. Needless to say, these are very broad categories, and it is sometimes debated if the word mechanism should be used at all in this setting. This will not be discussed here. Suffice is to say that the word mechanism seems to have several meanings in medicine [26].

The dichotomy between nociceptive and neuropathic pain has a long history. According to International Association for the Study of Pain (IASP), nociceptive pain is pain “that arises from actual or threatened damage to non-neural tissue and is due to the activation of nociceptors” [27]. Hence, nociceptive pain can be viewed as “normal” pain in the sense that there is nothing inherently pathological in feeling pain when there is actual or threatening tissue damage. On the contrary, not being able to feel pain is a threat to the survival of the organism, as evidenced by rare cases of congenital insensitivity to pain [28]. By contrast to nociceptive pain, neuropathic pain is pain “caused by a lesion or disease of the somatosensory nervous system” [29]. Characterizing the pain as neuropathic or not is important from the point of view of treatment [30].

Nociplastic pain is a rather recent category [27]. Nociplastic pain is almost by definition chronic and is defined as “pain that arises from altered nociception despite no clear evidence of actual or threatened tissue damage causing the activation of peripheral nociceptors or evidence for disease or lesion of the somatosensory system causing the pain” [31]. Simply put, if nociceptive pain has to do with injury of non-neural tissue and neuropathic pain with nerve injury, nociplastic pain is related to a sensitised nervous system [32]. Importantly however, the term nociplastic should not be regarded as synonymous with the neurophysiological term “central sensitization” [31, 33, 34]. Needless to say, “nociplastic” is (at best) a very broad category, but it is consistent with the view that certain forms of chronic pain are more like diseases rather than just symptoms of something else. Indeed, the newly adopted 11th version of the International Classification of Diseases (ICD-11) reflects this when it characterizes some forms of chronic pain as primary [14]. It is clinically important to identify nociplastic pain conditions because they will respond to different treatments compared to nociceptive pain, e.g., concerning the responsiveness to anti-inflammatory drugs or opioids [35]. Common chronic pain conditions like fibromyalgia, unexplained low back pain, or irritable bowel syndrome are usually considered nociplastic.

**The bio-psycho-social model**

When assessing a pain patient, it is not enough to only assess biomedical factors; psychosocial and behavioral factors are also essential to evaluate [36]. Another way of expressing this is that the “pain burden” must be assessed [25]. To capture the essentials of such a psychosocial evaluation, the acronym ACT-UP has been proposed: Activities (how does the pain affect life); Coping (how does the patient cope with pain); Think (what are the thoughts of the patient concerning the pain); Upset (what about depression, anxiety, anger?); People (how do others around the patient respond?). Another related concept is the concept of “yellow flags”, i.e., psychosocial risk factors [37]. All in all, there seems to be a broad consensus that both biomedical and psychosocial factors must be weighed together in a pain assessment [32, 38, 39]. Hence, the importance of the biopsychosocial (BPS) model in pain medicine [40–42].

It is not self-evident what the BPS model really entails, or even what it should be called [43]. For the purpose of the present paper, suffice is to say that biological/biomedical, psychological/behavioral, and social/socio-cultural factors are important to ascertain, the point being that the patient must be seen as an *active agent* whose behavior can partly influence the outcome. This is by no means unique for the pain field. To take an obvious example from a different field, although type 1 diabetes is obviously not caused by the behaviour of the patient, the behaviour of the patient is still an essential factor in the treatment of this disease. Likewise, the BPS model in the context of chronic pain does not mean that the pain is simply “explained away” by reference to
behaviour or psychology, or that chronic pain patients are
themselves to blame. Anecdotally, such misunderstandings
seem to abound, chronic pain patients often seeming to
believe that a psychosocial analysis is antithetical to a
biomedical one. Such an either-or is unfortunate.

The point of a BPS analysis in the chronic pain setting is
to identify the dynamics involved, i.e., to be able to clinically
interpret the situation of the patient from the point of view
of the real-life interaction of “bio”, “psycho”, and “social”.
Such dynamics can for instance lead to “vicious circles”,
unhelpful behaviors worsening the problem in a negative
spiral of mutually reinforcing factors. The clinician who
merely looks at biomedical details without being able to spot
such BPS dynamics will have problems understanding and
helping the patient. The perhaps most well-known example
of “dynamic” thinking in the pain field is the fear-avoidance
model [39], i.e., when meeting pain patients, it is important
that health care professionals ascertain whether the behavior
of the patient is dominated by pain-related fear and avoid-
ance – or indeed by its equally unhelpful opposite,
i.e., behavioral overactivity and dysfunctional persistence.
Health professionals should also be aware of other impor-
tant terms such as self-efficacy, coping, catastrophizing, or
hypervigilance [38, 44–48].

Conclusion: case examples using the pain assessment 3 × 3
framework

Arguably, it is very important for clinicians to be able to
aptly summarize the most important aspects of the pain
patient’s situation, not least when communicating with
colleagues. In this context, the clinical utility of the Pain
assessment 3 × 3 framework will be illustrated with three
examples.

Case 1: A 45-year-old woman previously diagnosed with
malignant melanoma is admitted because of a new, intense,
opioid-resistant pain in the right arm. A pain physician is
consulted, and in the clinical notes she summarizes the pain
situation of the patient as follows: “Cancer-related pain due
to new and big melanoma metastasis in the right brachial
plexus, i.e., neuropathic pain projected to the right arm.
Intense, hitherto intractable pain. The patient is exhausted
and very emotional, notably because of lack of sleep since the
new pain began but perhaps also because of existential
anguish after being informed by the oncologist that the cancer
has metastasized.” In all its simplicity, this short summary on
a Pain assessment 3 × 3 basis gives a wealth of information
about the situation of the patient. It also has clear treatment
implications (which will not be commented on here because
they fall outside the scope of the present paper).

Case 2: An 87-year-old man sees his GP because of
chronic pain that developed after shingles on the right
hemithorax 7 months ago. “Sorry to bother you about this”,
he says to his GP, “but it is really annoying now. I thought it
would go away, but now I can’t even have a shirt on without
it burning like fire!” In the medical records, the GP later
writes: “In short, chronic pain after shingles in an elderly
man, i.e., neuropathic pain with marked allodynia. Is despite
this optimistic, good coping capability and sense of humor,
no indications of pain-related anxiety or depression.” Again,
in just a few sentences, a wealth of pain medicine-related
information is given by using the three areas of the 3 × 3
framework.

Case 3: A 25-year-old man is referred to the pain clinic
because of chronic unspecific low back pain since about a
year. The pain physician writes in her assessment: “To
conclude, young man with generalized anxiety problems since
his teens, has now developed a chronic unspecific low back
pain condition which can be characterized as nocicliastic – for
which he has unfortunately been prescribed oxycodone for the
last few months. Pain-related fear of movement and high risk
of a negative spiral consistent with the fear-avoidance model.”

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