1 What is pain and how do we assess it?

Formally defined as an "unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage" (Raja et al. 2020), pain has an enormous impact on clinical outcomes. This formal definition captures several important aspects of pain: first, it is ***unpleasant***, meaning that most people strongly prefer pain relief to continued pain. Second, pain is a **sensory** AND **emotional** experience, which means that pain has both *sensory-discriminative* qualities, i.e. descriptive features such as burning or stabbing; as well as *unpleasantness*, i.e. aspects that pertain to suffering (Figure 1.1). The unpleasantness of pain profoundly motivates most people to seek relief. The ***suffering*** associated with pain motivated Epicurean philosophers (300 BCE) to observe in that the height of pleasure is reached with the absence of pain.

Essential to survival, pain normally functions as a warning sign of ***damage*** to the body. High mortality rates are associated with *painless* myocardial ischemia; patients who cannot perceive a heart attack won't seek medical care until it is too late. At the extreme end of this spectrum are patients born with genetic mutations that eliminate pain sensing, e.g. SCN9A sodium channel defects, these patients are at increased risk for mutilation and death (Cox et al. 2006).

Perhaps the most important aspect of pain the tremendous variability from one person to another**, interindividual variability**, Figure 1.2. Due to diverse biology, genetic, and environmental factors, it is truly not possible to "know another's pain." We must ask people about their pain in order to understand it. In a clinical setting, we call this "**pain assessment**."

Standard basic pain assessment includes assessment of: (i) Quality (burning, sharp, etc.), (ii) Region involved (arm, leg, etc.), (iii) Severity (also pain intensity), (iv) Timing (sudden, slow, waxing/waning), (v) Usually associated symptoms (rashes, vomiting, etc.), (vi) the things which make the pain Very much better (medicines, rest), and (vii) the things which make the pain Worse, Figure 1.3. This information, taken together, enables the clinician to formulate a preliminary **differential diagnosis**. Caring for patients with pain relies on strong basic clinical skills. It is essential to establish a problem list and a working differential diagnosis.

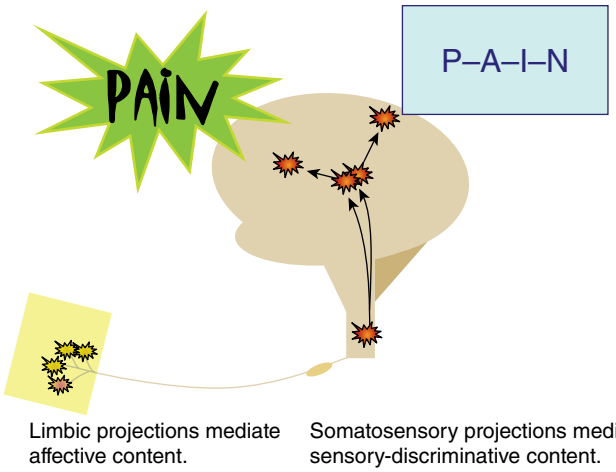

Figure 1.1 Pain has sensory-discriminative and emotional-motivational components.

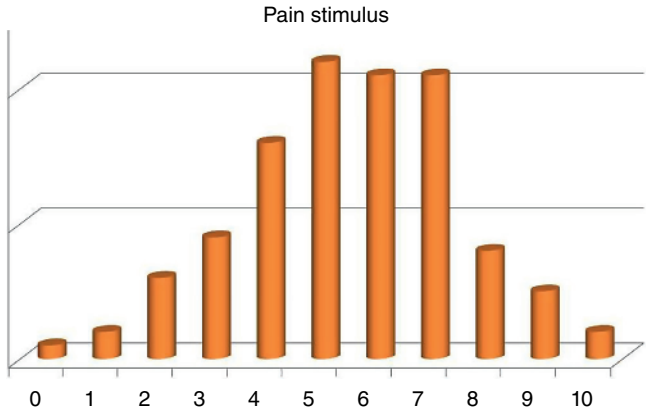

Figure 1.2 Interindividual variability in pain showing tremendous variability in healthy individuals exposed to pain stimulus.

Figure 1.3 Standard pain assessment: the pain 'Alphabet'.

Quality
Region
Severity
Timing
"**U**sually associated with"
"**V**ery much better with"
"**W**orse with"

Functional pain assessment includes appraisal of how pain impacts a patient's functioning in daily life. Are they able to: Carry out tasks at home? Work to full capacity? Engage in self-care? Interact with family and friends? Contribute to society normally? Enjoy life? And What is their quality of sleep? How is pain impacting their mood?

Limited pain assessment, at a minimum, focuses on pain severity. Through the use of pain intensity scales, it is possible to rapidly and reproducibly ask patients about pain. Clearly subjective, but highly reproducible, the **numerical rating scale (NRS)** is the preferred pain intensity scale (Figure 1.4). Widely used, it is easy to understand, rapidly explained and scored, does not require literacy, translates well to other languages, and shows robust response properties in clinical practice. Intubated patients can use an NRS presented visually. The NRS is properly referred to as an

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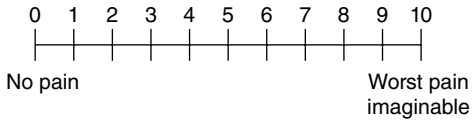

Figure 1.4 The numerical rating scale of pain severity (intensity).

"11-point scale" as 0 and 10 are both included. Changes of less than 2 points on the NRS are generally below the "**minimal clinically significant change**" threshold and not meaningful. Limited pain assessment, focusing on pain severity alone is only appropriate for **ultra-rapid re-assessment** of patients with an established diagnosis. Initial appraisal of a patient with pain should always include the elements of the standard basic assessment, and the functional pain assessment, pain frequently impacts function (Figure 1.5).

Over the years, a number of other pain scales have been used for verbal adults including the 'verbal descriptor scale' (mild/moderate/severe), the visual analog scale (a bar with no tick marks), a 100-point scale, and a pain thermometer. The NRS is currently the most widely preferred scale.

For children, it is important to conduct an **age-appropriate pain assessment**. Infants and pre-verbal children require behavioral pain scales, Chapter 50. For those with communication barriers, cognitive impairments, or dementia, situationally appropriate pain scales are necessary, Chapters 10 and 51.

There are several scales used in research that were designed to assess various aspects of pain. The McGill Pain Questionnaire includes a list of **77 pain descriptors** organized into **20 categories** that are grouped in major domains of sensory, affective and evaluative in nature, and ranging in intensity (Melzack 1975). For example, pain that is pulsatile, ranges from flickering to pounding. Reviewing this instrument can build awareness of the **diverse qualities** of pain descriptors. The Brief Pain Inventory (BPI) is another informative and widely validated pain assessment instrument (Cleeland 2017). The BPI asks about pain in terms of impact on various domains of function: sleep, mood, general activity, relationships with others, etc.; as well as rating pain intensity. Both of these scales are available on the web.

In a nutshell, pain is a major force in life and medicine. It determines many of the choices we make as we navigate potentially hostile and dangerous environments. In the absence of a functioning pain system, we cannot grow to adulthood without repeated traumatic injuries. Conversely, when the pain system goes awry and overamplifies pain, persistent suffering is the result. Through biomedical research and increasing patient-centeredness in clinical care, tremendous strides in understanding and managing the pain

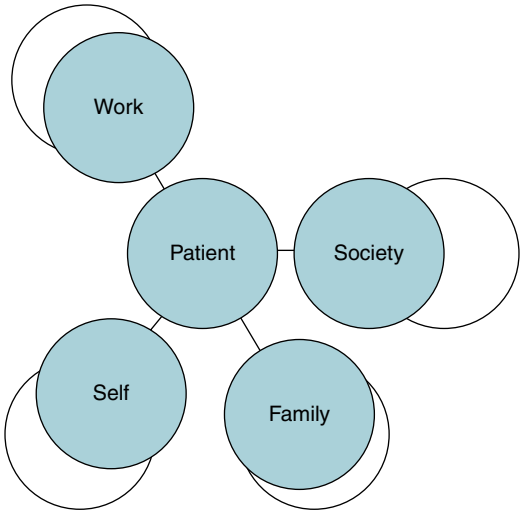

Figure 1.5 Pain interferes with function in multiple domains of daily functioning. A patient may experience varying degrees of impairment.

system are occurring with implications for improved healthcare and patient satisfaction. In this book, you will encounter pain in many different aspects, and learn the beginning steps to assessing and treating pain safely and effectively.

Pain is prevalent and impacts all patient outcomes: learning about pain will improve your clinical performance, enhance your career satisfaction, and increase quality of life for you, and for your patients.

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