



## Secondary and Tertiary Prevention of Chronic Pain

### Introduction

Prevention of pain and its chronic forms will reduce the burden of suffering for individuals and society, respectively. Secondary prevention aims to detect disease in the early stages and limits its progression [1, 2], whereby tertiary prevention aims to reduce or avoid complications or limiting consequences of the disease already present [1]. For pain, the definitions state to prevent individuals from developing chronic pain after initial onset of acute pain (secondary prevention), or to reduce ongoing disability, disuse or loss of social contacts and occupation, once pain has become chronic (tertiary prevention). Even though the research body for secondary pain prevention has grown during the past years, the focus remains on treating chronic pain.

The Global Year for the Prevention of Pain is a chance to raise awareness on strategies and interventions for the primary and secondary stages of disease development, supporting sufferers in maintaining daily physical, personal and social activities the best way possible to reduce the development of chronic pain. Recommendations in designing prevention trials have been published [3], which will hopefully generate reliable evidence.

### Secondary Prevention of Pain: Preventing Chronicity

The secondary prevention of pain was first described by Fordyce in the 1970s [4], when distinguishing between pain and pain behaviour (disabling behaviour). A prevention regime was applied to reduce pain behaviour, leading to preliminary promising results in terms of prevention strategies [2, 4] including time-contingent training and medication. Secondary prevention requires an understanding of the factors involved in chronification, validated instruments to detect patients at risk, and validated clinical strategies addressing these risk factors with specific interventions [5]. Several reviews report risk factors for maintaining different forms of pain; red (biological) and yellow (psychosocial) flags for musculoskeletal pain is the most common construct, followed by blue (occupational), black (compensation) and white (socio-cultural) [6] flags, where evidence is still pending regarding their impact in secondary prevention of pain. Specific mechanism-based risk factors would help designing preventive strategies providing future base of tailored interventions [5, 7]. Such risk factors have been identified in catastrophizing/maladaptive cognitions and depressive mood for developing chronic knee [8] or low back pain [9] as yellow flags, or joint damage as red flag for knee pain [8]. Others reported several risk factors for developing chronic pain after surgery (e.g. [10-12]) with sound evidence for age, gender, type of surgery, genetic factors, preceding pain or history of chronic pain of other origin and a variety of psychosocial factors. Screening instruments are available especially for back pain with preliminary evidence for their prognostic value [13]. Preliminary evidence is also provided that subgrouping patients regarding their risk for chronification and specifically tailored treatment is

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effective in the short and middle terms [14]. Education and exercise in preventing back pain from becoming chronic seems to be of best evidence at the moment [5, 7], primarily in the short and middle terms.

In contrast, iatrogenic factors (factors lying in the health care system) seem to contribute to chronification of pain, especially when solely focusing on somatic factors, ignoring multi-causal genesis of pain, overestimating the impact of somatic or radiologic findings on wellbeing of the patient and overuse of diagnostic procedures and rather passively oriented interventions in long term (e.g. massage) [15]. In light of these findings, responsibility of health care providers in treating pain in an evidence-based manner should not be underestimated and should be included into research activities.

Intensified effort in establishing models [3] such as the avoidance-endurance model [16] or, from basic science, deriving tailored treatments and generating evidence by pain researchers is needed. Incorporating spontaneous recovery from initial pain, saluto-genetic models and patient preferences for specific interventions [17] should be taken into future considerations.

### **Tertiary Prevention of Pain: Reducing Disability, Work Loss, Negative Emotionality and Social Isolation for Sufferers with Chronic Pain**

Tertiary prevention aims to reduce secondary effects of those suffering from chronic pain. Models such as the fear avoidance model [18, 19] or the avoidance and endurance model [16, 20-23] incorporate the functional, psychological and social impairment in leading a satisfying life by the affected individuals. The biopsychosocial model of pain [24-26] led to the development of biopsychosocial (synonymously multidisciplinary, interdisciplinary, multi component) treatment approaches. A corresponding definition was devised by an IASP Task Force in 2017 and published at IASP homepage (<https://www.iasp-pain.org/Education/Content.aspx?ItemNumber=1698>).

Mayer and Gatchel [27] introduced the biopsychosocial treatment approach in the 1980s. Its main aim is the restoration of physical, psychological and social functioning, involving a core team of multi-disciplinary healthcare professionals (physicians, physiotherapists, occupational therapists, psychologists and nurses) working in an integrated team setting [27].

Interdisciplinary treatment has been acknowledged as an appropriate answer to the comprehensive suffering of patients with chronic pain worldwide [28], but evidence is controversially discussed [29]. The heterogeneity of involved professions, providing interventions and the treatment composition, dose and duration of treatment, and the outcome assessment tools in clinical trials hampers considerably comparative effectiveness research and valid meta analyses [30]. Conceptual frameworks and mechanism based treatment designs, harmonized outcome assessment (considering comprehensive multidimensional outcomes [31]), carefully reported studies and carefully performed systematic research is needed to distinguish beneficial treatment from non-beneficial and, finally, to identify best treatment to specific groups of patients regarding their characteristics [32].

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