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# General Introduction





## GENERAL INTRODUCTION

### Shoulder pain

From all musculoskeletal disorders, shoulder pain is the third most common after low back- and neck pain in the general population <sup>1</sup>. Shoulder pain has a reported prevalence between 4.7 and 46.7% <sup>2,3,4</sup>. The difference in prevalence numbers might be attributed to the study settings or different definitions of shoulder pain. Shoulder pain can have a significant impact on patient health and can affect an individual's capacity to work and participate in social activities. The clinical course is unfavourable as it can persist for a long period of time whereas about 50% of the patients continue to have pain for over 6 months <sup>5</sup>. Musculoskeletal disorders are the second most costly health expenditure in the Netherlands <sup>6</sup>. Expenditures related to shoulder pain in primary care are estimated to be on average about 689 euros (for 6 months) on average per patient in 2003 <sup>7</sup>.

### Management in primary care

Most of patients with shoulder pain are managed in primary care <sup>8</sup>. According to the guideline of the Dutch College of General Practice (NHG) for general practitioners, the recommended treatment consists of providing information, lifestyle recommendations, prescriptions of (pain)medication and a possible referral to physiotherapy or a specialist in secondary care when conservative treatment fails <sup>9</sup>. A Dutch study showed that general practitioners refer about 38% of their shoulder patients of which 84% to physiotherapy and 16% to secondary care <sup>8</sup>.

### Diagnostic process in physiotherapy practice

Patients will visit their primary care physiotherapists, either through direct access or after referral by their general practitioner/medical specialist. The physiotherapist will gather information using history taking and start their clinical reasoning in order to determine the patient's problem. This clinical reasoning process is a continuous process of information gathering in order to generate an initial hypothesis. It is estimated that most patients (80-85%) with shoulder pain suffer from rotator cuff disease, otherwise called subacromial pain syndrome or subacromial impingement syndrome <sup>10, 11, 12</sup>. Research has shown that shoulder tests, regularly used in physiotherapy practice, do not lead to a valid patho-anatomical diagnosis and there is a lack of uniformity in these diagnosis in research and clinical practice <sup>13, 14, 15</sup>. Therefore, the term "non-specific shoulder pain" is often used, rather than a specific diagnostic label. Diagnosing patients with shoulder pain is complex. However, a clear working hypothesis/diagnosis as a starting point for physiotherapeutic management is important. With an accurate diagnosis, the patient has the best opportunity for a positive health outcome as the treatment can be better tailored <sup>16</sup>.

## Diagnostic imaging

Diagnostic imaging is commonly used for musculoskeletal disorders and is regarded as an important tool for the management of these conditions. For example, in the case of red flags in patients with low back pain or upper extremity disorders, diagnostic imaging can be used to identify specific pathology<sup>17, 18</sup>. Imaging usually only serves a purpose in the diagnosis of specific pathologies. Likewise, several studies conclude that routine imaging for patients with acute low back pain and knee pain is not indicated when looking at patient reported outcome measures, either due to asymptomatic findings or the absence of reassurance<sup>19, 20, 21</sup>. Diagnostic imaging in patients with shoulder pain is only recommended after ineffective treatment in primary care<sup>9</sup>.

Recently, there has been an increase in the use of diagnostic ultrasound for musculoskeletal disorders in primary care<sup>22, 23</sup>. Diagnostic ultrasound is considered to be a safe, non-invasive and accessible method to visualize extra-articular lesions and could help the physiotherapist's in their diagnostic process<sup>24, 25</sup>. It could be a useful imaging method for patients with musculoskeletal disorders. Previous research showed that the interobserver reliability between experienced medical specialists (often radiologists) is good in patients with shoulder pain<sup>26, 27, 28</sup>. It might open subsequently the opportunity to tailor treatment<sup>29</sup>. Diagnostic ultrasound could even serve to monitor progress since 50% of newly symptomatic tears progress in size compared to 20% in asymptomatic tears<sup>30, 31</sup>. Whether the use of diagnostic ultrasound could lead to better treatment processes and improve recovery for patients with shoulder pain remains unknown. Contrary, the use of diagnostic imaging procedures could even lead to overdiagnosis and unnecessary referrals to secondary care when detecting asymptomatic findings, as pathology found does not always explain the complaints<sup>32, 33</sup>. For ultrasound operators, it is essential to realize the consequences of false positive or false negative results for patient expectations and health care costs. Only a small number of medical specialists report that they trust the ultrasound findings made by physiotherapists and general practitioners<sup>34</sup>. Consequently, the diagnostic ultrasound is commonly repeated in secondary care.

## Prognosis

The natural course of shoulder pain is not favorable. Only between 25% and 50% of patients with shoulder pain report to be recovered after 6 months in primary care<sup>35, 36</sup>. Prognostic information is important because it may provide a greater knowledge of who is likely to recover, or who will or will not respond to physiotherapy. It ensures efficient use of resources since a subgroup of patients with chronic complaints could account for a large part of the total costs<sup>37</sup>. Furthermore, it can assist the clinical decision-making process. At the moment, we cannot reliably define subgroups based on traditional diagnostic labels and help the patient with their expectations on the course of their shoulder pain<sup>15</sup>. Previous studies showed that duration of complaints, lower disability scores, and

being younger are prognostic factors for recovery<sup>38, 39</sup>. What determines a prolonged course of complaints requires further investigation to determine whether improvements in diagnostic and prognostic processes may reduce recovery time.

### **Working alliance**

An accurate patient history, physical examination and identification of prognostic factors seems to be important for establishing a targeted treatment plan. There should also be a mutual collaboration between the therapist and the patient that involves emotional bonding, and agreement on the tasks and goals of treatment<sup>40</sup>. Communication between the physiotherapist and the patient should be ongoing to monitor progress and address any issues that might aggravate physical or psychological symptoms. Shared decision making has become an important novel aspect in this the communication process<sup>41, 42</sup>. Shared-decision-making is a conjoint decision –making process in which the therapist and patient are actively involved in the treatment plan<sup>43</sup>. A good working alliance could strengthen the patient's participation in this shared decision-making process and compliance to treatment. Earlier studies have found a positive correlation between working alliance and treatment outcome<sup>40, 44, 45</sup>. Working alliance might therefore be an important prognostic factor for recovery in patients with shoulder pain.

### **Management in physiotherapy practice**

Physiotherapy usually includes a range of different interventions like exercise therapy, stretching, advice, massage and/or electrotherapy aimed at controlling/relieving pain and improving function of the shoulder. The evidence statement for subacromial complaints of the Royal Dutch Association for Physiotherapists (KNGF) recommends exercise therapy with active movements of the glenohumeral and scapulothoracic joint when there is sufficient range of motion. Despite this evidence statement, physiotherapy treatment seems to be highly variable<sup>46, 47</sup>. Several studies have studied effects of different interventions for shoulder pain, however the heterogeneity of management protocols makes it difficult to follow guidelines<sup>36, 48</sup>.

### **Objective of this thesis**

In summary, current physiotherapy management in patients with shoulder pain is unknown. Additionally, little is known about the effect of diagnostic imaging procedures, especially diagnostic ultrasound, as a relatively new imaging procedure in primary care physiotherapy. The current evidence statement do not makes a recommendation on the use of diagnostic ultrasound. Due to the lack of reproducibility of traditional diagnostic labels, subgroups based on prognostic factors could help facilitate more appropriate treatment plans. Several prognostic factors have been described and it is believed that

diagnostic ultrasound and working alliance might also be potential prognostic factors for recovery.

Therefore, the main objectives of this thesis are (1) to describe current management in relation to diagnostic work-up (including the use of diagnostic ultrasound) and treatment strategies of physiotherapy care for patients with shoulder pain (2) to identify prognostic factors and develop a prognostic model (including the use of diagnostic ultrasound and working alliance) of recovery for patients with shoulder pain.

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