



# INSTRUCTING & ASSESSING NEW STAFF ABOUT DUPUYTREN'S DISEASE

Research Report

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## Abstract

**Background.** The quality of care of the local hand therapy service could be enhanced, by adjusting the efficiency and effectivity in training on Dupuytren's disease for new occupational therapy staff and students. It provided an unclear image to assess if the trainee was ready for independent practice. The information provided was evidence based, but dated and provided from one perspective. **Purpose.** This study aimed to create a tool for the new occupational therapy staff of the local hand therapy service, where they learned about Dupuytren's disease, about the occupational therapist's role before & after surgery, how to splint and the treatments which result in the best return to function for the patient, in order to prepare new staff for independent practice. **Methods.** A literature research provided 30 analysed articles, identified through database searches. These were screened according to a flow diagram and checklist. Qualitative practical research was undertaken, the method used was individual interviews with local new members of staff and the local hand therapist to gather data and was analysed through coding. **Findings.** The literature research provided an evidence based ability to implement competencies and methods for treating Dupuytren's disease, such as techniques for increasing range of motion, wound healing management, measuring of functional outcome, silicone gel sheeting, massage, splinting, using function based activities & sensory re-education. It also provided an evidence base on the beneficial role of the occupational therapist & methods of education for the training program, such as teaching practical and pragmatic decision-making during practice, linking theory to practice & qualitative inquiry. The practical research further added to this by providing local data, such as experience, knowledge and preferred methods of learning for new members of staff and requirements set by the trainer, needed for localising this training program, ensuring it was locally effective, efficient and implemented when finished. **Implications.** Recommendations were made for the creation of a locally efficient and effective training program on occupational therapy treatment of Dupuytren's disease, along with the creation of products supporting the training program, such as a revised treatment protocol and concept occupational therapy guideline, serving as background information.

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## Introduction

For the second and final internship of the occupational therapy study at Rotterdam University, the student needed to work on a thesis as well as his internship. This thesis was based on an assignment or question from the placement at which the student worked. The goal of the internship and the thesis was for the student to show that he was on the level of an early career professional and possessed the competencies that are needed for maintaining this level. The competencies 'maintaining quality' and 'innovation' need to be acquired by every occupational therapist (Verhoef & Zalmstra, 2007). It was critical for this assignment that the student developed these competencies (Rotterdam University of Applied Sciences, 2014). 'Maintaining quality' has a strong link with the main goal of occupational therapy, improving quality of life of the patients, but it can also contribute to the quality of care of the department (Hartingsveld, Logister-Proost, & Kinébanian, 2010). The placement was at the occupational therapy department of NHS Highland, Raigmore Hospital in Inverness, Scotland.

### Background information on the local department

The hand therapy service, which is part of the occupational therapy department, introduced a research question regarding Dupuytren's disease. 75% of their patients have Dupuytren's, they provide them with pre- & post-surgical treatment. The occupational therapists role here is on a functional level, before and after surgery. This includes advice regarding the best return to function, as well as making splints which are made & worn post-surgery. Return to function is important, this enables the patient to improve his quality of life through using his hands more effectively. There are fifteen occupational therapists working at Raigmore occupational therapy department. The hand therapy service consists of one occupational therapist, who gets several occupational therapy students a year and new rotational junior occupational therapy staff every nine months. They need to be informed about Dupuytren's treatment by this staff member, because of its unique and specific nature and to ensure maintaining quality of care. There is a need to improve the current method of training new staff members, since it impacts the time spent on quality of care of the hand therapy service. Currently the occupational therapy department at Raigmore uses a PowerPoint® presentation and hands on experience to teach new staff about Dupuytren's. The question introduced was; *What could provide new Occupational Therapy staff and students with the knowledge and skills to treat Dupuytren's disease and inform patients on how to get the best outcome from surgery?* ((Anonymized), personal communication, 17-02-2015).

### Definition, nature, progression and implications of Dupuytren's disease

Dupuytren's is an affliction which causes the fascia in the palm of the hand to harden and form scar tissue nodes. These nodes grow and connect, forming cords. These cords often spread and branch out into the fingers. Most affected are the little- and ring finger (Rayan, 2007). They harden up over time and start to tighten and shrink. This causes the fingers to pull towards the palm of the hand, resulting in an inability to fully stretch the fingers (Townley, Baker, Sheppard, & Grobbelaar, 2006). There is currently no cure, only surgeries that improve the contracture, but the patient will potentially face further surgery after some years (Werker, Press, van Rijssen, & Denkler, 2012). Dupuytren's impairs patients in their daily life in an advanced stage. Occupational Therapy can contribute to improving quality of life of Dupuytren's patients with splinting and exercises (Thoma et al., 2014). The most reported daily life problem is functional decrease, where patients have trouble gripping items and wearing gloves. Other reported problems are dangers from catching fingers, maintaining personal hygiene, self-consciousness and an uncertainty of further progression through a lack of information (Pratt & Byrne, 2009; Engstrand, Borén, & Liedberg, 2009). The cause for Dupuytren's is unknown, although a genetic factor does seem to effect the prevalence, as

Dupuytren's is most often reported in north-European countries. Dupuytren's most often occurs in men of 50 years or older. Prevalence numbers of Dupuytren's fluctuate per region and increases in patients with Diabetes and Frozen Shoulders (Hindocha, McGrouther, & Bayat, 2009). The literature demonstrates the unique nature, progression & implications of Dupuytren's. It is important for practitioners to have an understanding of these facts when undertaking treatment.

### Current local working methods and enhancement opportunities

The local hand therapy service requires a tool for new staff, where they learn about Dupuytren's, about the occupational therapist's role before & after surgery, how to splint and the treatment which result in the best return to function for the patient.

Currently, verbal instruction is given, with no standardized means of assessing how much knowledge & skills are acquired. The PowerPoint<sup>®</sup> used gives theoretical information only, anything practical is taught on the job by the occupational hand therapist. This makes the trainee dependable on information provided by that staff member, the quality of care can be enhanced by providing information to the trainee from multiple sources & perspectives (Campbell, Roland, & Buetow, 2000). By providing a more diverse source of knowledge, the trainee would be able to more efficiently perform and pick up evidence based knowledge and practice (Campbell, Roland, & Buetow, 2000). The theoretical information consists of epidemiological and treatment information on Dupuytren's, making sure the desired knowledge of the disease is acquired by the trainee, effectively improving the quality of care when done correctly (Choudhry, Fletcher, & Soumerai, 2005). The articles used as sources are accessible but dated and originate from around 1990 and have not been updated since, going against evidence based care, revision could enhance the local quality of care (Kuiper, Verhoef, de Louw, & Cox, 2008). The practical information consists of making patterns and splints and working with protocols, ensuring the same framework is used department-wide. Fabrication of splints is dependent on the surgeon's requests, as each one prefers different methods, which also goes against working evidence based (Kuiper, Verhoef, de Louw, & Cox, 2008). This current method of training new staff is time consuming. Training of the new staff results in a loss of treatment time for the patients from the hand therapy service, putting unnecessary pressure on the quality of care from the service, for the patients. This means little therapy time and waiting lists. The quality of care, from the perspective of the patient, therapist and hospital management, can be enhanced by making sure that the specific skills and knowledge of the new staff and students after training are acquired (Choudhry, Fletcher, & Soumerai, 2005). Improvement on quality of life for the patient can be ensured by teaching them self-management (Pratt & Byrne, 2009), currently there is no means to measure if new staff has the specific knowledge required to teach this to the patient. ((Anonymized), personal communication, 17-02-2015)

Raigmore patients attend a pre-assessment clinic to be instructed on what's going to happen during surgery and the period thereafter. Instruction is included about the splinting regime and the care for their hand, the assessment consist of an interview & measurements done with a goniometer to set a reliable baseline for the patient's range of motion (Engstrand, Krevers, & Kvist, 2012). Upon leaving pre-assessment, patients are given a document to remind them of the information discussed. After surgery, patients return to occupational therapy for follow-up including splint fitting and monitoring & maintaining surgery results to ensure the best return to function possible. This process changes depending on the surgery methods performed (appendix 5), as some are more invasive than others. The occupational therapists use an evidence based protocol (appendix 3) (NHS Highland, 2004). This protocol is promoted to provide good treatment results. The protocol lists information about the treatment, but offers no in-depth instruction on, for instance, fabricating a splint and the reasoning behind it. The sources used to make the protocol are dated, in order to maintain quality, these can

be updated to be more evidence based. The protocol loses reliability, primarily because of its dated sources and is in need of a review with current evidence (Kuiper, Verhoef, de Louw, & Cox, 2008). On occasion the consultant requests a deviation from protocol, if the consultant thinks this will benefit the individual patient's therapy results.

### Formation of a research question

All these factors provide an incentive for further research on requirements needed for improvement on the currently used local training program for new members of staff on Dupuytren's disease.

The main research question, formed after the problem analysis is:

*Which requirements must be met when training new occupational therapy staff and students, to ensure they efficiently obtain the competencies needed for evidence based independent practice on patients in the post-operative phase of Dupuytren's disease with problems in hand function and self-management?*

This question divides in sub-questions for research purposes:

- 1- *Which competencies does an occupational hand therapist require for independent practice on patients with Dupuytren's disease in the post-operative phase?*
- 2- *Is there evidence that post-operative splinting improves the hand function of patients with Dupuytren's disease?*
- 3- *Is there evidence that instruction by an occupational hand therapist contributes to self-management for patients in the post-operative phase of Dupuytren's disease?*
- 4- *Which educational methods contribute optimally to training new occupational therapy staff and students for independent practice?*

### Report's further structure

After the introduction, this report will focus on the methods used during the research to acquire, process and analyse data. Secondly, the report lists the results found using those methods, providing a description of the results. Next, the 'discussion' section links the results together and discusses the selection and implication for local practice of relevant data found. It also discusses the limitations of this research and makes recommendations for further studies and projects. Finally, the conclusion provides an answer for the main research question.

## Method

The research consisted of two major parts. The first was creating a theoretical frame of reference, by performing a qualitative literature research, gathering an evidence base on the main research question. The second part was performing a qualitative practical research, by using the method of qualitative interviews with local members of staff and students in order to gain the ability to localise the generic knowledge gained through the literature research.

### Creating a reliable evidence base through literature research

#### Search strategy

The literature research (appendix 7) provided answers for sub-question 1,2,3 & 4. Evidence was searched in professional research libraries like Google Scholar, Pubmed, Cinahl, Medline, OT seeker, British/American/Canadian Journal of Occupational Therapy and the British Journal of Hand Therapy. Searches were also done in Knowledge Network, a search engine provided by National Health Services (NHS) education, able to search all previously mentioned databases at once. All search terms used were listed, but main searching terms were Dupuytren's, Treatment, Assessment, Instruction, Education, Splinting and Occupational Therapy. The search terms were combined using operators "AND", "OR" & "NOT" in order to efficiently control the relevance and amount of results a search

provided. The screening of articles and choices of combining search terms were done by title and abstract. The article was screened on content and according to the PRISMA group's flow diagram and checklist afterwards (Moher, Liberati, Tetzlaff, & Altman, 2009). The search history was also documented and listed in the literature research.

### **In- & exclusion criteria**

Several criteria needed to be met to be able to select an article. If deviations of these criteria occurred and the article was still used, this was stated & explained accordingly (Kuiper, Verhoef, de Louw, & Cox, 2008).

The article had to be:

- recent, no older than the year 2000.
- either Dutch or English.
- the highest evidence level possible.
- relevant to the research questions, by title and abstract.
- provide evidence relevant to the research questions, by content.

Articles were analysed and summarized for each sub-question. Finally, conclusions were drawn.

### **Qualitative practical research for localisation data**

The qualitative practical research was a small-scale research executed by performing individual qualitative interviews as a method of data collection, this data was required for localising generic evidence found in the literature. This consisted of three interviews held with local occupational therapy junior (band 5) staff and two with occupational therapy students, but also consisted of an interview with the local trainer to ensure successful implementation of the envisioned products.

### **Creating interview questions**

All questions (appendix 8 & 9) were made into a semi-structured interview to provide reliability. The questions were derived from the literature research and the main research goal, supporting localisation of the generic knowledge gained through the literature research. Therefore, questions are about the participant's previous experience in occupational therapy in order to filter which participants already knew about occupational therapy treatment of Dupuytren's disease and take this into account during analysis. Questions about local knowledge of starting occupational therapy staff and students were also created, in order to set a baseline for the training's difficulty level and locally preferred learning methods, for implementing the training as efficiently as possible.

### **Localising evidence by interviewing local junior staff & students**

The interviews (appendix 8), as a qualitative research method, provided answers to localise the generic evidence found in the literature research for the occupational therapy department of Raigmore Hospital, aiming to make the final conclusions and resulting products more efficient and effective. The interviews focused on sub-question 1 & 4 of the main research, covering the content and means of the training. The participants were approached through internal e-mail, going out to all local band 5 staff. The three responding junior band 5 occupational therapy staff (starting professionals) and two responding occupational therapy students at Raigmore were interviewed anonymously with a semi-structured interview, after giving informed consent (appendix 10). The interviews were about the participants' knowledge & skills of treating Dupuytren's and their experience with educational methods. It was not required by Rotterdam University to transcribe the interviews (Rotterdam University of Applied Sciences, 2014), however, data was processed by recording the interviews and providing a sentence-by-sentence summary of each interview, allowing for an efficient analysis of the qualitative research.

## **Analysing the gathered data**

The analysis was done according to the three step method described by Brent & Slusarz (2003). This involves “open coding” (p. 285), which creates and links codes to segments of the field notes and interviews for categorisation. This is followed by “axial coding” (p. 285), which connects and divides codes to categories and links these together to offer contextualisation. Finally, “selective coding” (p. 285) allows the research codes to be compared and contrasted for analysis by looking at selective key themes. These key themes can then be used for the descriptive narrative of the report (Brent & Slusarz, 2003). The coding process was then double-checked by the local thesis supervisor to ensure validity and reliability of the analysis (Hak, 1997). The goal of the interviews was to show which requirements and means are needed and preferred in a training about treating Dupuytren’s at Raigmore. This could then be compared to the outcomes of the literature research, so those results could be localised into an effective and adequate training tool.

## **Additional data required for ensuring implementation**

In order to ensure practical implementation of the envisioned products, the generic information from the literature research had to be localised in order to be useful and practical. This was partially achieved by doing the qualitative interviews with junior band 5 staff and students, in order to get local preferences of the target group receiving training. However, to make sure the products would be implemented and used, another interview (appendix 9) was held with the occupational hand therapist who would execute the training and use the products. This interview focused on key elements that were required in the theoretical training, final products of the research and locally viable methods of practical training, before it would be useful locally. By ensuring to add these requirements, it is possible to promote and enhance the implementation of the final product in the Raigmore Hospital hand therapy service. This interview was coded by the same method described by Brent & Slusarz (2003).

## **Results**

### **Evidence found in the literature research**

The literature search resulted in 30 articles; nine were evidence level I, eighteen evidence level II and three evidence level III (Shekelle, Woolf, Eccles, & Grimshaw, 1999).

## **Enhancing surgical outcome by mastering Dupuytren’s disease treatment competencies**

A seminal piece of work by Shimeld & Weed (1982) reports that general key areas of professional healthcare practice are: “credentialing” (p. 54), auditing, utilization review, clinical activities and continuing education. These key elements must be taken into account in order to be able to assure quality of care as a practitioner. Credentialing focuses on ensuring the practitioner has the right credentials for the position, or is willing to acquire these. Auditing focuses on reflection and evaluation of the practitioner. Utilization focuses on efficiency of the practitioner, examples are use of time, materials, services and how referrals are handled. Clinical activities are meant for the assessment of clinical programs and reviewing problems that occur, creating an acceptable standard of practice. Continuing education focuses on keeping the practitioner up to date on his/her education. These are key elements for assuring quality in overall independent practice and can also be applied to post-operative treatment of Dupuytren’s (Shimeld & Weed, 1982). These key elements can be considered competencies required for medical independent practice.

Occupational Therapy interventions on a functional level aimed towards the hand, wrist and forearm can return patients with such afflictions to full occupational engagement. Research by Amini (2011) supports the usefulness of these multiple interventions, which are the competencies needed for independent occupational therapy practice on patients with hand, wrist and forearm injuries. Specification is required for Dupuytren’s disease.

Bielecki & Wysocki (2011) posited that post-operative treatment by a hand therapist on Dupuytren's patients can enhance the surgical outcome. The most important areas in hand therapy after surgery specifically for Dupuytren's disease include: early detection of potential postoperative complications, including disturbances in wound healing; oedema control; scar management; maintenance of surgical correction & restoration of finger flexion. They also report a hand therapist should see the patient immediately after removal of surgical dressings to give advice on active mobilization (Bielecki & Wysocki, 2011).

Specific competencies required for treatment of Dupuytren's can be selected by combining the articles by Amini (2011) and Bielecki & Wysocki (2011). These competencies are: techniques for increasing range of motion, wound healing management, measuring of functional outcome, silicone gel sheeting, massage, splinting, using function based activities & sensory re-education.

All these findings allow for the creation of a competency list for independent occupational therapy practice on Dupuytren's disease.

### **The dysfunctionality of splinting with Dupuytren's disease**

Although post-operative splinting to counter extension deficits is considered a standard intervention, a systematic review by Larson & Jerosch-Herold (2008) shows there is little high level evidence available to support its functionality. Recent articles suggest post-operative splinting for Dupuytren's provides no benefit when the patient receives instructions and exercises during post-operative care (Huisstede, Hoogvliet, Coert, & Fridén, 2013; Kemler, Houtt, & van der Horst, 2012; Jerosch-Herold, Shepstone, Chojnowski, Larson, Barrett, & Vaughan, 2011; Collis, Collocott, Hing, & Kelly, 2013). Post-operative splinting can even increase complications during early wound healing by putting unnecessary mechanical stress on the extension (Evans, Dell, & Fiolkowski, 2002). The systematic review by Larson & Jerosch-Herold (2008) provides insight on the articles available on post-operative splinting of Dupuytren's, contrasting articles for contemporary splinting to those against post-operative splinting. This review showed articles demonstrating no benefit in post-operative splinting are of a higher evidence level. Post-operative splinting can help when a contracture occurs of 15° or more in the proximal interphalangeal joint and/or 20° or more in the metacarpophalangeal joint after the first week (Jerosch-Herold et al., 2011). However, a lack of research in revision and duration procedures of not splinting makes it difficult to currently adopt this method as the new standard (Sweet & Blackmore, 2014), which is very important information. Another use for splinting with Dupuytren's is to delay surgery (Larocerie-Salgado & Davidson, 2012).

### **Certainty of progression with patient-education after surgery**

Bielecki & Wysocki (2011) report that an occupational hand therapist should see the patient immediately after removal of surgical dressings to give advice on active mobilization. Seeing the patient directly after removal of dressings enables the occupational therapist to instruct the patient on a home program, so the patient can do self-treatment at home and the time frame of certain goals should be discussed. This method saves both money and time and allows the patient to get an understanding of his own progression (Sweet & Blackmore, 2014). A study also suggests patients with Dupuytren's disease know too little about it to be able to make informed decisions on their treatment, resulting in uncertainty of progression. Informing the patients about Dupuytren's will increase their self-management, because they have more understanding of progression, surgical treatments, post-operative rehabilitation & features of the disease (Pratt & Byrne, 2009). If the patient doesn't meet the set goals in the set time-frame it is advised to review the home program and follow up directly (Sweet & Blackmore, 2014).

### **Increasing confidence and credibility by linking theory to practice during occupational therapy education**

Many occupational therapy educations focus on evidence based practice, however as reported by students, this educational methodology does not fully address the essential practical and pragmatic decision making needs of practitioners (Tomlin & Borgetto, 2011). The need for education when transitioning to practice is a recurring theme for occupational therapy students (Roberts, Hooper, Wood, & King, 2015). Educating occupational therapists and students in qualitative inquiry prepares

them for independent practice beyond making decisions based on evidence. Training (future) occupational therapists in qualitative inquiry helps them in thinking, performing and acting with integrity, for more professional decision-making and forming positive practice habits. Positive habits mentioned are reflection, reflexivity, being critical and being actively engaged (Marterella & Aldrich, 2014). Reflexivity is defined as “a strategy that makes explicit the deep-seated views and judgements that effect the research process” (Carpenter, 2010, p. 131; Macgregor, 2015).

Research shows linking theory to practice during occupational therapy education is advised to increase students’ and newly graduates’ confidence and that theoretical knowledge provides credibility towards other professionals (Hodgetts, Hollis, Triska, Dennis, Madill, & Taylor, 2007). Sharing insight between other professions is beneficial for knowledge & abilities for practice obtained by students and makes students more willing to collaborate. Interprofessional education lets students develop competencies for delivering quality care, gain knowledge of other professions and develop a professional identity (Dubouloz, Savard, Burnett, & Guitard, 2010).

### Data gathered through qualitative practical research

Brent & Slusarz (2003) report that qualitative interview analysis is best done through coding. Coding the interviews makes for an efficient analysis of the results to ensure for effective and complete conclusions to be drawn. Shown here are these descriptive narratives, formed by the final ‘selective coding’ phase described by Brent & Slusarz (2003), contrasting and linking all selected key themes obtained through the interviews. Showing both the new staff member interviews as the implementation interview. The narratives are divided into the themes created during the ‘axial coding’ phase. The complete coding process is shown in appendix 8 & 9.

#### Narrative of junior staff and student interviews

##### Experience theme

When comparing the experience of all interviewed participants, it shows that there is a versatile pool of experience. Widespread working posts show that the participants all bring along different occupational therapy experience in orthopaedics, community, stroke unit, surgical, mental health rehabilitation, homeless daycentre, hospice, care of the elderly, drug and alcohol abuse and acute medical working posts. However none of these participants have any experience in occupational hand therapy or with Dupuytren’s disease. Some report seeing other practitioners performing hand therapy, from which they draw their knowledge.

##### Knowledge theme

The participants’ knowledge of Dupuytren’s disease is therefore basic and potentially flawed, for example considering it a disease of the tendons. However they do report knowledge of the disease’s causes and effects, for instance the curling in of fingers towards the palm, the functional difficulties and the daily life difficulties. Two participants also know that surgical correction is possible, and one realises that this procedure is not a cure.

When asked about separate elements of treating Dupuytren’s disease, the participants know more about it. The most commonly mentioned knowledge was on splinting and range of movement. For splinting they reported that it was beneficial to the positioning and healing of the hand and that dynamic splinting was possible for exercising. On range of movement they knew that support of physiotherapy was possible and that activity based goals could be used. Others reported knowledge on oedema management and sensory treatment. Elevation was a theme connected to oedema management and sensory treatment was linked to the daily dangers for a patient with damaged nerves. Only one participant reported knowledge of training grip strength by using putty. One participant reported knowledge of scar management through the use of massaging.

When asked about their thoughts on the requirements of Dupuytren’s treatment training, the majority reported a preference on providing background knowledge as the emphasis. This way the causes and effects of the disease become clear to the therapist and this knowledge forms the basis

for patient education. However another preferred emphasis is on range of movement, primarily splinting, because this is considered key to the patient's recovery.

### **Education theme**

All participants report a preference to practical instructions, during which they have the ability to write notes, see examples and gain their own experience. Writing notes is reported as an efficient method to revise the theory afterwards, but a preference to have this backed-up by a hand-out containing factual knowledge is also reported. They all report a preference for face-to-face feedback which enables them to ask questions. One participant would like to receive extra written feedback for future reference.

When asked about suggestions for methods of training in Dupuytren's, almost all report a preference for a theoretical introduction with a practical training afterwards.

## **Narrative of the implementation interview**

### **Products theme**

The implementation interview showed the preference of the local practitioner for viable methods of training and research products. By analysing the interview it can be ensured that resulting products can be successfully implemented into local practice.

There was a preference for a protocol to support members of staff in implementing treatment on Dupuytren's disease during independent practice. The protocol should have a step-by-step approach, based on the time frames used in local treatments and easy to use as a quick overview. The protocol contents should be about treatments, but also means to review and discharge patients. Furthermore the protocol should contain information about splinting (style, fabrication and standards) and "red flags" to recognize patients that need to be referred back. A desire for separate background information besides the protocol is also expressed. The goal of the background information should be to give an understanding on Dupuytren's disease occupational therapy treatment.

### **Theoretical training**

When asked about theoretical training, the therapist suggests a presentation for visual cues and observation of treatments. Another suggestion is to allow the new member of staff to engage in a dialogue with the patient in an attempt to educate the patient about his disease. It is also mentioned that the theoretical training should be before and after practical training. The theoretical training after could consist of a hand-out to enable new member of staff to revise high quality background information and relate to their experience during practical training. The contents of the theoretical training should be about getting a broad understanding of the disease, its causes and effects, the occupational therapist's role and the fact that there is no cure.

### **Practical training**

The goal of practical training should be to prepare the new member of staff for independent occupational therapy practice on Dupuytren's disease. A method suggested is a supervised case-practice. Practice material is limited, as splinting material is needed for the patient, supervised case practice would solve this issue. The practical training should be spread in a time-frame that allows to see multiple stage of occupational therapy treatment on Dupuytren's disease. A desire for reachable standards is also expressed, as this would allow for a quick method of assessment. A favoured assessment method is the Witnessed, Assimilated, Supervised, Proficient (W.A.S.P.)(appendix 6), used by other local services as a graded assessment model which results in the competency of independent practice.

## Discussion

### Relevance and implications of the literature research

The literature research provides evidence to be able to create a list of competencies needed for specific independent occupational therapy practice on patients with Dupuytren's disease. Recent articles suggest post-operative splinting on Dupuytren's is unnecessary in most cases, if the patient receives additional post-operative occupational hand therapy, and can even increase the chance of complications. A lack of research in revision and duration procedures of not splinting makes it difficult to currently adopt this method as the new standard and requires further research. The evidence shows the importance of post-operative occupational therapy on Dupuytren's patients and the fact that it enhances surgical outcome. A home program is promoted to provide patient-education on post-operative Dupuytren's disease in the first treatment, this allows the patient to self-manage at home and this saves time and costs to health organisations. The research shows there is room for improvement in occupational therapy education, it often does not cover teaching practical and pragmatic decision-making during practice, a recurring theme for occupational therapists transitioning to practice. It also shows that linking theory to practice is beneficial for occupational therapy education. Training in qualitative inquiry proves to be a promising method to improve this.

### Relevance and implications of the junior staff & students interviews

The interviews result in an overview of basic local knowledge of students & junior staff in occupational therapy treatment of Dupuytren's disease, which can be used for deciding the difficulty and emphasis of new local training programs fitting to the trainees. The interviews also show that it can be expected that starting junior staff & students have no prior experience in hand therapy. Furthermore, the participants express their preferences for methods of learning and training, which can be considered suitable for the localisation of a training program.

### Relevance and implications of the implementation interview

The implementation interview resulted in preferences of the local occupational hand therapist in regard to the research product. The local practitioner interviewed will be the user of the envisioned products and trainer to the trainees. By taking these preferences into account, successful implementation can be ensured. Preferences were expressed for the desire for a protocol that is both efficient and effective at supporting new members of staff in treating Dupuytren's disease. The preferred contents were also discussed. There was also a need for a separate hand-out with background information, to give an understanding of occupational therapy treatment at Dupuytren's disease. For the theoretical training the practitioner preferred the use of presentations, observation & the opportunity for the trainee to educate patients about their disease as training methods. The moment & contents of theoretical training were also discussed, the training should take place before and after practical training, for the ability to relate to experience. Finally, practical training and its assessment were addressed, covering its contents, time-frame and methods.

### Combining the trainee with the trainer for practical research results

When combining both staff & student interviews and the implementation interview, a locally suitable theoretical & practical training program is envisioned. The practical research resulted in an overview of local knowledge and preferences in training and learning of the targeted trainees. Also, it resulted in an overview of preferences of the trainer for a locally useful, efficient and effective training program on occupational therapy treatment of Dupuytren's disease.

### Comparing all data for establishing local practice implications

When comparing the results of the literature research with the results of the practical research, relevant data regarding a locally viable and evidence based occupational therapy training program on Dupuytren's disease can be selected.

#### **A confidence boost through theoretical training**

The interview results revealed the local need for a theoretical introduction and finish regarding Dupuytren's disease, with practical training regarding Dupuytren's disease in between. The literature shows that linking theory to practice during education increases students' and newly graduates' confidence and that theoretical knowledge provides credibility towards other professionals, which could be incorporated into this local training (Hodgetts, Hollis, Triska, Dennis, Madill, & Taylor, 2007). This method of training suggested by the local members of staff allows for the revision of theory after practical training, to link theory to practice based on experience. The theoretical finish of the training could be covered by providing a high quality background information hand-out, as suggested by the occupational hand therapist.

#### **A guideline with theoretical background information**

The literature research addressed the importance of covering decision making during occupational therapy education, whose need was confirmed by the practical research, through the request for background information on the disease (Tomlin & Borgetto, 2011). This background information should, according to the interviews, elaborate on overall Dupuytren's disease with as goal to give an understanding of occupational therapy treatment for that disease, much like a guideline would.

#### **Real case-based patient education as practical training**

Competencies found in literature were techniques for increasing range of motion, wound healing management, measuring of functional outcome, scar management, splinting, using function based activities & sensory re-education (Amini, 2011; Bielecki & Wysocki, 2011; Sweet & Blackmore, 2014), these were used during the practical research to establish that prior knowledge and experience of the local participants on these competencies is basic and require significant training. The literature showed that the role of the occupational therapist is beneficial to pre- and post-operative treatment on Dupuytren's disease (Pratt & Byrne, 2009). It also adds that promoting patient education and self-management increases treatment and surgery results (Sweet & Blackmore, 2014), which overlaps with the local demand for patient education as a training method mentioned during practical training.

Evidence showed that training occupational therapists in qualitative inquiry improves their decision-making as well as the formation of positive practice habits (Marterella & Aldrich, 2014), this can be covered by the locally requested method of a real case-based practical training and graded supervision. This also supports the local availability of practice materials, by allowing for minimal waste of materials. It is also key that the practical training covers multiple stages of treatment and builds up to independent practice of the trainee. This can be covered by using the locally available W.A.S.P. assessment sheet (appendix 10), which allows for identification of the practice level the trainee has reached and to discuss this through locally requested face-to-face feedback.

#### **Need for support during practice through a protocol**

The research also provided a critical time-frame in which the therapists needs to treat the patient, which can be implemented with the local request to make an easy to use time-frame based treatment protocol for practice support, like listing discharge requirements and "red flags" for re-referral (Bielecki & Wysocki, 2011).

### Limits of the research and recommendations for continuation

The limits of this study apply mostly to the amount of Dupuytren's research available. There are limited amount of articles available on post-operative therapeutic treatment differences between specific surgeries, causing the term "post-operative" to be generic. There are also limited articles on the impact of specific interventions, causing an unclear image of when splinting is beneficial, when it

is not and what alternative interventions could be used (Amini, 2011; Sweet & Blackmore, 2014). Only the research of Jerosch-Herold et al. (2011) provided precise numbers on when a splint should be considered, but these numbers were unfounded by evidence and used out of ethical necessity of the trial.

Compared to the research proposal, one research question is dropped, because the answer comprised of repetition and the same information would return in the conclusion.

As the researcher was not trained in analysing qualitative data, the results of the analysis could be less optimal than if the researcher was trained, however this was compensated by having the process double-checked (Hak, 1997).

The articles by Shimeld & Weed (1982), Shekelle, Woolf, Eccles, & Grimshaw (1999) & Hak (1997) are older than allowed, but are still used because they are seminal pieces of work, which are not bound to change much over the years.

For continuation of the research it is recommended to perform a practical research on post-operative splinting for Dupuytren's disease and its effective threshold. Evidence on this subject is currently limited, but if found, alterations to the post-operative treatment are warranted and have consequences for this training program. Another recommendation is to further research and finish the created concept occupational therapy guideline for Dupuytren's disease (appendix 5), as a limited time-frame did not allow for the completion of the guideline into an officially recognized product.

## Conclusion

The research provides requirements that need to be met when training new occupational therapy staff and students, to ensure they efficiently obtain the competencies needed for evidence based independent practice on patients in the post-operative phase of Dupuytren's disease with problems in hand function and self-management. The research shows it is recommended locally to create a training program with a theoretical introduction, followed by case-based, patient education focused practical training. A means of gradually assessing the trainee and provision of the ability to revise the theory in relation to practical experiences must be incorporated. The research also showed the need for a revised local protocol and background information in the form of an occupational therapy guideline for support during all parts of the training program. These were created to prepare the program for implementation in local practice (appendix 4 & 5).

Further recommendations regarding the procedure and content of a locally viable occupational therapy training program on Dupuytren's disease were made in appendix 2.

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## Appendix 2: Recommendations

### ***Procedural based recommendations***

When taking all data into account, it is recommended to create a training program with a theoretical introduction, followed by a practical training with means of gradually assessing the trainee and concluded by providing the trainee the ability to revise the theory and relate this to their practical experiences.

The method of the practical training should be case-based and gradually more independent. It should also cover multiple stages of treatment on Dupuytren's disease. The research shows that training by practicing patient education is a good method to start from. Consequently the trainee should be able to practice several stages of treatment with support, after which the support slowly decreases. This can be assessed and controlled using the W.A.S.P. assessment sheet (appendix 6), scoring the trainee's proficiency of treatment. It is important that whenever this assessment is performed, the trainee gets face-to-face feedback, in order to ask questions. The time-frame based revised protocol with updated evidence base (appendix 4) can support the trainee during the practical training.

The theoretical training should consist of two parts. The first part is a theoretical introduction preceding the practical training in the form of the already locally available PowerPoint® presentation. This should be supported by using the concept occupational therapy guideline on Dupuytren's disease (appendix 5) that was created as a hand-out containing background information. The second part of the theoretical training, after the practical training, should consist of the ability for the trainee to review the theoretical training and relate to this to the practical experience obtained. This could be realised by allowing for time to review the concept guideline (appendix 5).

### ***Content based recommendations***

The content of the practical training should be about techniques for increasing range of motion, wound healing management, measuring of functional outcome, scar management, splinting, using function based activities & sensory re-education. The training should be aimed towards trainees with no prior knowledge of Dupuytren's disease. The limited availability locally influences the recommendation to perform the practical training on actual patients.

Contents of the theoretical training should be about creating a general understanding of Dupuytren's disease and its treatment, supporting clinical decision making and promoting patient education and self-management.

Contents of the newly created revised protocol with updated evidence base (appendix 4) are focused on treatment support, discharge requirements and "red flags" for re-referral. The protocol itself is sorted by the locally used treatment time-frames and is kept short to be easy to use.

The contents of the newly created background information (appendix 5) are aimed towards providing overall knowledge on Dupuytren's disease, occupational therapy treatment options and support in decision making. Due to the scale of the amount of information this transformed into a concept guideline for Dupuytren's disease, which can serve as a hand-out during theoretical training.

## Appendix 3: Old Raigmore Hospital Protocol

### **Raigmore Hospital Hand therapy service:**

### **Dupuytren's contracture: therapy protocol**

#### **Indications for surgery:**

- Existence of joint flexion contracture of 30° at IP's./M.C.P.'s
- Existence of functional problems.

#### **Referral:**

- Referral should be made via standard splint request form. No later than 3 days post-op.
- Liaise with ward staff to co-ordinate Occupational Therapy and Physiotherapy appointment with post-op clinical appointment.

#### **Pre-op Assessment:**

- Establish baseline for treatment
- Measure range of movement at all hand joints.
- Brief assessment of A.D.L.
- Pain Level
- Demonstrate and advise regarding post-op splinting regime.

#### **Treatment:**

- Splintage
- Maintain/increase range of movement
- Scar management (see separate protocol)
- Oedema management (see separate protocol)
- Restore grip strength
- Promote normal function/independence with A.D.L.

#### **Patient Education:**

- Explain aims of treatment
- Offer advice on A.D.L. and scar management (see separate protocol)

#### **Splintage:**

- Fabricate thermoplastic volar hand and forearm based splint. To be worn at nights for six months post-op.
- Suggested material – “preferred”

**Position of splintage:**

Wrist in neutral or slight flexion (approx. 15°)

MCP's & IP's at 0° or maximum extension possible

Unaffected digits may be left free if required for function.

Splint may incorporate maintaining first webspace.

**Week 1:****Occupational Therapy:**

- Dressing reduced and wound checked at consultant's out-patients clinic. This may be at Raigmore or arranged at a peripheral location, likely occupational therapy.
- Splint fabricated at OT department, to maximize extension. Patient information leaflet is issued.
- Check sensation and advise as necessary.

**Physiotherapy:**

- Physiotherapy commenced at Raigmore or at first review peripherally. Follow-up assessment arranged locally – unless returning to Raigmore.
- Assessment of range of movement and sensation.
- Commence active and passive exercise programme.
- Advice regarding home exercise program

**Week 2:****Occupational Therapy:**

- Check splint; adjust as necessary, to obtain maximum extension.
- Measure range of movement
- Monitor wound and commence scar management as appropriate.
- Monitor and treat oedema as necessary.

**Physiotherapy:**

- Monitor range of movement.
- Progress exercise.
- Scar management.

**Week 3-6:****Occupational Therapy:**

- Scar management

- Oedema control
- Continuation of splinting regime
- Continuation of exercises
- Return to ADL as possible.
- Check sensation – desensitisation as required.

**WOUND SHOULD BE HEALED BY 3 WEEKS.**

**Physiotherapy:**

- Continue mobility exercises
- Commence resisted exercises.
- Desensitisation programme if required.

**SHOULD BE ABLE TO MAKE FIST AT 6 WEEKS.**

**Week 6 – 6 months:**

- Continue splinting regime
- Continue exercises
- Continue scar management
- Review by therapists as required
- Re-refer to consultant if needed

**6 months:**

- Discard splint (unless otherwise advised)
- Usually will have final out-patient visit at this time.

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# Occupational Therapy protocol for Dupuytren's Disease

## Raigmore hospital hand therapy service

### Indications for surgery:

- Existence of joint flexion contracture of 30° at IP's./M.C.P.'s
- Existence of functional problems.

### Referral:

- Referral should be received via a standard splint request form. No later than 3 days post-op.
- Liaise with ward staff to co-ordinate Occupational Therapy and Physiotherapy appointment with post-op clinical appointment.
- Check for consultant's preferences of treatment, if present

### Treatment 1: Pre-op Assessment:

- Establish baseline for treatment
- Measure & chart range of movement at all affected hand joints.
- Brief assessment of A.D.L.
- Pain Level
- Demonstrate and advice regarding post-op splinting regime.

### Patient Education:

- Educate patient about Dupuytren's disease
- Explain aims of treatment & surgery, issue surgery information leaflet.
- Offer advice on A.D.L.

### Treatment 2: directly after removal of surgical dressings

- Dressing reduced and wound checked at consultant's out-patients clinic. This may be at Raigmore or arranged at a peripheral location, likely occupational therapy.
- Check sensation and advise as necessary.
- Splint fabricated at OT department, to maximize extension. Splinting information leaflet is issued.

### Splinting:

- Fabricate thermoplastic volar hand and forearm based splint. To be worn at nights for six months post-op.
- Suggested material – "Omega max"

**Position of splint:**

Wrist in neutral or slight flexion (approx. 15°)

MCP's & IP's at 0° or maximum extension possible

Unaffected digits may be left free if required for function.

Splint may incorporate maintaining first webspace.

**Patient Education:**

- Educate patient about oedema management

**Treatment 3: Two weeks post-operatively**

- Stitches are removed
- Check splint; adjust as necessary to obtain maximum extension.
- Measure & chart range of movement
- Monitor wound and commence scar management as appropriate.
- Monitor and treat oedema as necessary.

**Patient Education:**

- Educate patient about scar management

**Further treatment: Week 3-6**

- Scar management
- Oedema control
- Continuation of splinting regime
- Continuation of exercises handed out by physiotherapy
- Return to ADL as possible.
- Check sensation – desensitisation as required.

**Red flag for re-referral to consultant/nurse: WOUND SHOULD BE HEALED BY 3 WEEKS.**

**Further Treatment: Week 6 – 6 months:**

- Continue splinting regime
- Continue exercises
- Continue scar management
- Review by therapists as required
- Re-refer to consultant if needed
- 12 weeks and up: patient can use more strength in the hand

**Red flag for re-referral to consultant/nurse: SHOULD BE ABLE TO MAKE FIST AT 6 WEEKS.**

**Further Treatment: 6 months and up**

- Discard splint (unless otherwise advised)

- Usually will have final out-patient visit at this time.
- Discharge patient

**Discharge requirements:**

- Consultant discharges patient
- Patient is back to optimal function (extension & flexion)
- Patient's scar is as flat and supple as possible
- Patient's sensitivity is as normal as possible
- Patient continuously does not show

**Sources:**

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# OCCUPATIONAL THERAPY GUIDELINE FOR DUPUYTREN'S DISEASE

An early concept guideline



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# 1. Introduction

## 1.1 Background

This early concept guideline is a part of a personal graduation dissertation and is based on a literature research for that same graduation dissertation. It is important to keep in mind that the main goal was to make an overview of available occupational therapy treatment and general information on Dupuytren's disease in order to instruct and support occupational therapist in their treatment options and clinical reasoning. The research was focused on gathering contemporary evidence base for occupational therapy treatment and was made in a limited timeframe. Therefore, some of the assessments featured in this guideline are based on personal experience and require more research for a more complete overview. Other information provided in the guideline is based on the literature research. For more information on the origin of this guideline, read the original research report by van den Ouden (2015).

This guideline, when finished, could be used to create reliable Dupuytren's disease protocols for localized occupational hand therapy. It is important to keep in mind that hand injuries and occupational therapy treatments are quite functionally orientated, with less attention for assessing patients' activities than normal occupational therapy treatments and hardly focuses on assessing the patients' participation problems.

## 1.2 Target group/client group

Dupuytren's is an affliction which causes the fascia in the palm of the hand to harden and form scar tissue nodes. These nodes grow and connect, forming cords. These cords often spread and branch out into the fingers. Most affected are the little- and ring finger (Rayan, 2007). They harden up over time and start to tighten and shrink. This causes the fingers to pull towards the palm of the hand, resulting in an inability to fully stretch the fingers (Townley, Baker, Sheppard, & Grobbelaar, 2006). The cause for Dupuytren's is unknown, although a genetic factor does seem to effect the prevalence, as Dupuytren's is most often reported in north-European countries. Dupuytren's most often occurs in men of 50 years or older. Prevalence numbers fluctuate per region. The prevalence of Dupuytren's increases in patients with Diabetes and Frozen Shoulders (Hindocha, McGrouther, & Bayat, 2009). The literature demonstrates the unique nature, progression & implications of Dupuytren's. It is important for practitioners to have an understanding of these facts when undertaking treatment.

## 1.3 Consequences of Dupuytren's disease

There is currently no cure, only widely used surgeries that improve the contracture, but the patient will potentially face further surgery after some years (Werker, Press, van Rijssen, & Denkler, 2012). Dupuytren's impairs patients in their daily life in an advanced stage. Occupational Therapy can contribute to improving quality of life of Dupuytren's patients with splinting and exercises (Thoma et al., 2014). The most reported daily life problem is functional decrease, where patients have trouble gripping items and wearing gloves. Other reported problems are dangers from catching fingers, maintaining personal hygiene, self-consciousness and an uncertainty of further progression through a lack of information (Pratt & Byrne, 2009; Engstrand, Borén, & Liedberg, 2009). Occupational hand therapy is most beneficial in the post-operative stage, but can also help pre-operatively in delaying the surgeries required (Thoma et al., 2014).

There are four kinds of surgical procedures that the patients can undergo. The first is where the Dupuytren's cord is injected with the collagenase enzyme to weaken it and after manipulation of the fingers, the cord snaps (Badalamente, & Hurst, 2007). The second is a needle fasciotomy where a small incision is done to snap the cord, then the fingers are straightened (Eaton, 2011). The third is a

limited fasciectomy, where the patient's hand is cut open and the complete cords are cut out of the hand to enable the fingers to go straight again (van Rijssen, ter Linden, & Werker, 2012). The fourth method is a dermofasciectomy where both the cords and skin are removed. A skin graft is needed to cover up the open wound (Armstrong, Hurren, & Logan, 2000). The first method is very expensive and not yet widely performed; the second is used when there is only one cord present, especially in a relatively early stage. The third method is used for multiple or longer cords with branches going out to other fingers. The fourth method may be used for recurring Dupuytren's when there is insufficient skin coverage for the wound. Each procedure can result in different priorities during occupational therapy treatment.

## **1.4 Other disciplines**

According to Sweet & Blackmore (2014), apart from occupational therapy, other disciplines can also be involved in the treatment of Dupuytren's disease. These disciplines are general practitioners (GP), surgeons, nurses and physiotherapists often specialised in hand treatments. The GP can be involved by recognizing and referring Dupuytren's patient to a specialized consultant/surgeon. The surgeon's role is to determine when and if surgery is needed on the Dupuytren's affected hand, to decide on which surgery to perform, to refer to the other disciplines if desired and finally to execute the surgery and oversee its results. The nurse's role is to manage the wound healing post-operatively. The physiotherapist focuses his/her treatment on the range of motion of the patient, most often post-operatively (Sweet & Blackmore, 2014).

Note that it is more and more common that specialized occupational therapists or physiotherapists work in close conjunction with the hand surgeon to ensure the most optimum post-operative results. These are referred to as hand therapists and take over the roles of occupational therapy, physiotherapy and the nurse.

## **1.5 Implementation**

The implementation of this guideline is not yet realized, as it is in early concept stages and in this point in time serves as a means to support my personal graduation research and form a local protocol for my final placement. It also functions locally as a means for new staff and students to learn about what they can do as an occupational therapist at a Dupuytren's treatment.

## **1.6 Acknowledgements**

Thanks goes out to (Anonymized) for her guidance and tips during the creation and execution of this research resulting in this concept guideline. Thanks also goes out to (Anonymized) for helping development during clinical hours and providing corrections on the research where needed. Thanks also goes out to (Anonymized) for her feedback and guidance provided during this whole research process. Finally, thanks goes out to (Anonymized), for showing me the ropes during my placement. Without all of these parties, this concept guideline could not have been of the same quality of which it currently already is.

## 2. Diagnosis

This part of the guideline focuses on how to diagnose any problems that can occur caused by Dupuytren's disease. The main goal of diagnosis as an occupational therapist is to set a baseline pre-operatively, allowing you to track the therapy progress during post-operative treatment.

### 2.1 Participation

This is mostly done pre-operatively, to set therapy goals. This can be diagnosed by using a semi-structured interview assessments such as the Canadian Occupational Performance Measure (COPM) or Occupational Performance History Interview II (OPHI-II).

### 2.2 Activities & tasks

As surgical correction is expected, less focus is put on current problems in activities and tasks done by the patient, often it is quickly addressed during the same pre-operative interviews as the one required for the participation diagnosis.

### 2.3 Functions & Basic skills

#### 2.3.1 Sensory functions

Treatment & diagnosis of sensory functions with Dupuytren's disease is not a standard intervention used by occupational therapists. Most often, this is only done when sensory complications long after the operation. Healing of any nerve damage done during the operation can result in pins and needles, shooting pains, tingling and burning sensations and are part of a normal healing process in the first few weeks. However, there are occupational therapy assessments available to diagnose and track sensory treatment progress if the complications remain (Bielecki, & Wysocki, 2011).

##### 2.3.1.1 Assessments

###### 2.3.1.1.1 Semmes-Weinstein Monofilaments test

As discussed by Tracey, Greene & Doty (2014), the Semmes-Weinstein monofilaments (SWM) are widely used to assess tactile point pressure sensitivity and is also good for tracking and evaluating treatment progress. This assessment consists of a set of 20 sturdy plastic wires (monofilaments) to be pushed into the hand, when applying a certain amount of force, the monofilament bends, in order to prevent more pressure from being applied. The wires all vary in thickness and amount of pressure needed before bending. This can be used to track the pressure threshold and support & evaluate the effectiveness of desensitisation treatment. The patient is required to look away when the therapist puts pressure on the affected area and tell when he experiences any sensation. This allows the therapist to locate the sensitive area and effectively map it and measure the severity all at once. Performing the test requires minimal training, but some knowledge on the most effective technique is required. A study shows that a 'three down one up rule' provides the most reliable results, which implies that testing should always take place in a set of four gradually increasing monofilaments. It is advised to always measure and chart the data. Drawing a map of the hand and the location of the sensitive area, with the filament experienced as tolerable written in, allows for a good method of revision on the next measurement (Tracey, Greene, & Doty, 2014).

## **2.3.2 Motoric functions**

Diagnosing motoric functions is a crucial part of occupational therapy treatment of Dupuytren's disease. In the diagnosis stage, a therapist can set a baseline to work from during the treatment. Diagnosis of motoric functions can be done pre-operatively and post-operatively, accurately tracking the progress of the disease and treatment. Several assessments are available, depending on the severity and amount of digits in the hand which are affected by Dupuytren's. It is important when measuring motoric functions to always chart & date the measurements for future reference.

### **2.3.2.1 Assessments**

#### **2.3.2.1.1 Goniometer**

A goniometer is a reliable and widely used method to chart, measure and track the range of motion (ROM) for each specific joint in Dupuytren's. It allows for the measurement of joint angles in degrees. Measuring, charting & dating the results of measurements is important for the ability to review the ROM in follow-up treatments. In the diagnosis stage of Dupuytren's disease, a therapist uses a goniometer to set a baseline for all joints in the hand. The baseline of flexion is a good point to aim towards post-operatively, whereas the baseline set for extension of the fingers pre-operatively can show the results of the surgery and exercise thereafter (Engstrand, Krevers, & Kvist, 2012).

#### **2.3.2.1.2 Grip strength test**

Grip strength tests are a reliable method of charting, measuring and tracking the progression of grip strength (Wang & Chen, 2010). Grip strength tests ask the patient to grip a device in the hands, after which they are required to clench their fist. The device reads the amount of strength applied. It is important to instruct the patient well, as the device unexpectedly doesn't give in. Another key instruction is to get the patient in the right position, with the arm along the side of the body, the elbow in 90 degrees and the wrist in a neutral position and not supporting the arm. This ensures a reliable method of measurements, available for tracking progress in grip strength. Another important part of taking the measurements is to let the patient alternate between the affected and unaffected hand if possible, in order to compare. Finally, each hand should be tested three times, after which the grip strength's average is taken as the final measurement. It is important to note that measuring grip strength can only be done from twelve weeks post-surgery. It is important to measure, chart and date the grip strength for future reference.

#### **2.3.2.1.3 Pinch dynamometer**

If the thumb is affected by the Dupuytren's, it is a reliable method to chart the strength in the thumb with a pinch dynamometer (Puh, 2010). This enables the therapist to measure pinch strength in three different grips; lateral, two point and three point grip. The dynamometer is held by the therapist as the patient performs these grips as instructed by the therapist. The lateral grip requires the dynamometer to be pinched between the lateral side of the index finger and the pad of the thumb. The two point grip requires the dynamometer to be pinched between the tip of the thumb and the tip of the index finger. The three point grip requires the dynamometer to be pinched between the pad of the thumb and the tip of the index and middle finger. Commonly, only the lateral pinch grip is measured for practical purposes. Just as the other grip test, this measurement should be alternated between both hands, and after three times, the average is taken as a measurement. It is important to measure, chart and date the pinch strength for future reference.

#### **2.3.2.1.4 Oedema**

A method to assess and track post-operative oedema over time is by measuring the circumference of the visually affected area by using a tape measure. During the treatment phase, this measurement could be repeated by the therapist, in order to track and evaluate treatment progress. Therefore, it is important to chart & date the completed measurements, but also to carefully describe the measured

area, in order to be able to repeat the same measurement on review. This is most often done if the patient needs reassurance of the oedema actually decreasing, as well if complications arise.

#### **2.3.2.1.5 Pulp to palm**

If the patient has trouble forming a fist, the therapist can diagnose the current state of the hand by measuring from pulp to palm. This means measuring the distance of the pulp of the finger, to the base of the hand palm. It is again important for review to chart and date the measurement, as well as to note which finger was measured. After and during treatment on range of motion, this measurement can be used to evaluate and adapt the treatment if necessary.

### **2.4 Personal factors**

Personal factors of the patient should always be taken into account when diagnosing, for example if the patient is left or right handed and which hand is affected. However other factors like the patient's medical history and comorbidity can all affect the diagnosis.

### **2.5 Context: environment**

The environment can also affect the patients diagnosis, factors like work, roles, hobbies, having support from friends and family and the accommodation of the patient can affect his decision on having and selecting a surgery as well as his recovery after surgery.

## **3. Setting goals & decision making**

Treatment goals for Dupuytren's, from a therapeutic perspective, are mostly of a functional nature. Setting goals for Dupuytren's depends on if the patient decides to have surgery, or if the patient wants to delay or avoid surgery. The main goal will still be functional, for instance; "getting optimal finger extension", but the goals of specific treatments change accordingly. Using the patient's participation, activities & tasks as motivational goals can also improve the patient's return to function, especially post-operatively, this can result in a compliant patient. However, actually observing these activities is not general practice and is mostly left to the patient's self-management, but the patient is questioned about his participation (Sweet & Blackmore, 2014).

Bielecki & Wysocki (2011) posited that post-operative treatment by a hand therapist on Dupuytren's patients can enhance the surgical outcome. The most important areas in hand therapy after surgery specifically for Dupuytren's disease include: early detection of potential postoperative complications, including disturbances in wound healing; oedema control; scar management; maintenance of surgical correction & restoration of finger flexion (Bielecki, & Wysocki, 2011). This can be used during the decision making of treatment priorities post-operatively, with a required pre-requisite knowledge of especially wound-healing in order to be able to judge what is normal and what needs attention at what time to avoid complications. Pre-operatively, the decisions are far less critical, as no acute traumas are present. Decisions most important are based on the splinting duration (Larocerie-Salgado, & Davidson, 2012), pre-operatively the discussions held with the therapist can alter patients decision on whether to proceed with surgery.

## 4. Treatments

### 4.1 Wound healing phases

Wound healing phases are crucial during the whole post-operative treatment phase and should be used for decision making on when the patient is ready for which treatment. Post-operative wounds are referred to as acute wounds and follow a predictive sequence of overlapping phases. It is important to know about the wound healing phases as a therapist, but also for the patient to know at what stage he is allowed to do what, in order to encourage self-management at home (Woo, 2013). Being informed on wound healing phases also allows the therapist to spot complications and act accordingly, most often by referring back to the surgeon or nurse.

#### 4.1.1 Phase 1: Inflammatory phase

This phase follows 24-36 hours after the creation of the wound, and has the goal of establishing an immune barrier against invading bacteria. Acute wounds with a bacterial imbalance will not heal, so this phase is crucial. This phase forms swelling around the wound, by bringing destructive cells in to attack invading bacteria. Redundant cells extrude to the wound surface. 48-72 hours after injury, additional cells with clotting and tissue growth factors come into play, allowing for the start of healing, after the initial inflammation (Woo, Ayello, & Sibbald, 2007; Velnar, Bailey, & Smrkol, 2009).

#### 4.1.2 Phase 2: Proliferative phase

In the second phase, tissue repair is the main focus, this phase kicks in on the third day after wounding and lasts about 2 weeks. Granulation are key visuals expected to be seen. Another important factor to note in this phase is collagen synthesis. Collagen imparts integrity and strength to all tissues, In this phase, collagen focuses on giving strength to the newly formed tissue. This newly forming tissue process is called epithelialization and works from the edges of the wound towards its center. When the epithelial cells (skin cells) meet the migration of new cells stop and the newly formed skin is ready for more strengthening (Woo, Ayello, & Sibbald, 2007; Velnar, Bailey, & Smrkol, 2009).

#### 4.1.3 Phase 3: Remodelling phase

This final phase focuses on making more and strengthening skin cells and the formation of scar tissue and sets in about 2 weeks after wounding and may last up to 1 or 2 years and occasionally even longer. It is important to note the role of collagen in this phase, among others providing strength and integrity to the skin cells. The collagen fibres, after wounding, may regain approximately 80% of its original strength, trying to reach this balance, the synthesis and breakdown of collagen sets in about 3 weeks after wounding. Overtime, the collagen starts to form scar tissue for strength and cross links and shrinks in size. Overtime, the blood flow to the area declines and activity in the wound site decreases, resulting in a fully matured scar with high tensile strength (Woo, Ayello, & Sibbald, 2007; Velnar, Bailey, & Smrkol, 2009).

### 4.2 Participation & Activities & tasks

Occupational therapy treatment on Dupuytren's disease focuses on functional treatment, however, using participation, activities & tasks as a therapy goal is often a good motivation for the patients (Bielecki & Wysocki, 2011).

## 4.3 Functions & Basic skills

### 4.3.1 Sensory functions

Amini (2011) promotes sensory re-education for effective post-operative sensory treatment of Dupuytren's disease, although this most often only occurs with long lasting post-operative complications.

#### 4.3.1.1 Sensory re-education

Sensory re-education focuses on the patient re-educating his brain on sensations in the hand (Rosén, Balkenius, & Lundborg, 2003). This is done by letting the patient concentrate on applying different materials on and around the problem area. The materials selected can vary in texture and shape, in order to re-educate the sensation. Comparing the affected hand's sensation with the unaffected hand's sensation can support the patient's awareness of how the texture should be experienced. By slowly increasing the roughness of the selected material, the sensation of the patient should normalize.

For sensory re-education it is key that the patient focuses on all senses, so that he can train himself how the sensation should be experienced. Stimulation of the nerves with this method stimulates the nerve repair of the body (Svens, 2009).

### 4.3.2 Motoric functions

Effective treatment options of Dupuytren's disease on motoric functions are named by Amini (2011); splinting, exercises for increasing range of motion, scar management and oedema management. Bielecki & Wysocki (2011) add to this by promoting the use of function based activities in the patient's daily life. Sweet & Blackmore (2014) posit that self-management of the patient should also be promoted throughout treatment, as a lot of motoric function treatments require the patient to continue them independently at home.

#### 4.3.2.1 Splinting

Although widely challenged and researched, post-operative splinting to counter extension deficits remains a standard intervention (Sweet & Blackmore, 2014). Many researches show there is little high level evidence available to support its functionality & benefit and promote to stop the use of splinting altogether, as long as the patient receives instructions and exercises during post-operative care (Larson & Jerosch-Herold, 2008; Huisstede, Hoogvliet, Coert, & Fridén, 2013; Kemler, Houpt, & van der Horst, 2012; Jerosch-Herold, Shepstone, Chojnowski, Larson, Barrett, & Vaughan, 2011; Collis, Collocott, Hing, & Kelly, 2013). However, post-operative splinting can help when a contracture occurs after the first week of surgery (Jerosch-Herold et al., 2011). Currently, no article researched at what amount of contracture splinting is beneficial, causing splinting to remain a standard intervention, as not enough research has been done to prove its redundancy. Another use for splinting with Dupuytren's is to delay surgery (Larocerie-Salgado & Davidson, 2012).

Splinting primarily makes use of thermoplastics, a plastic that gets soft in hot water and sets when cooled off. This allows the therapist to make "made to measure" patterns (most often first on paper) for the desired model of splint and mould this onto the patient's hand after cutting it out of the plastic. For Dupuytren's, splints are most often used during the night-time and stretch the patient's fingers to optimum extension. The splint can be adjusted after frequent time intervals, at the beginning of the post-operative treatment, 1-2 week intervals are most often used. This night-time wearing regime can continue for up to 6 months and has a close relation to the formation of scar tissue, as discussed at the wound healing phases, if the patient's scar has healed, a consideration can

be made for a short wearing period. By stretching out the fingers overnight, contraction of the scar tissue is minimized, allowing for optimal range of motion during the day.

Practical experience is most important for acquiring preferences in materials, patterns and wearing regimes. It also trains the therapist in spotting problems in the splint's design, for instance the creation of pressure points or rough edges, harmful to the patient and can be adjusted immediately after the initial mould.

#### **4.3.2.1 Exercises for increasing range of motion**

There are a lot of exercises available to promote the range of motion (ROM) of the hand. When providing exercises, there is a difference between passive and active exercises. Passive exercises make the patient move his fingers without the use of his own muscles, for instance by moving them with the other hand. Active exercises make the patient move his fingers with his own muscle strength, without further assistance (Brunner-Ziegler, Strasser, & Haber, 2011). When deciding between using active or passive exercises, the patient's muscle strength and integrity of the muscles and tendons should be taken into account. For treatment on Dupuytren's active exercising is most often used and is started after the removal of the surgical dressing. Exercises are done during the day. For the fingers, the most commonly used exercises are the Tendon Gliding Exercises (TGE), which stimulate the full ROM of the fingers (Wehbe, 1987). When the thumb also needs exercising, exercises that stimulate its full ROM should also be selected. It occurs that the patient struggles to use the full range of motion of each joint, the therapist can then teach the patient to block the other joints with one hand, while actively and more efficiently exercising a specific joint.

TGE exercises consist of five movements to be made with the hand. The first is full extension of the fingers. The second is making a 90 degree flexion in the knuckles, also called the metacarpophalangeal (MCP) joints. The third movement is adding a 90 degree flexion in the proximal interphalangeal (PIP) joints, so that the tips of the fingers touch the base of the palm. The fourth movement is adding a 90 degree flexion in the distal interphalangeal (DIP) joints, so that the patient's hand ends up in a fist. The final movement is the abduction of the thumb. This stimulates the full range of motion of these joints (Wehbe, 1987).

When exercising, progress over time can be tracked by making use of the pre-operative ROM baseline set in the diagnosis stage as well as regularly measuring, comparing and charting the joint's ROM. Promoting the patient's use of the hand in daily life contributes to a faster increase of the ROM (Bielecki & Wysocki, 2011). When handing out exercises, the patient needs to do them by himself at home in regular intervals, the frequency is mostly based on preference of the surgeon and the therapist, but on average is three times a day. Because of this, efficiently teaching the patient the exercises and promoting self-management is key (Sweet & Blackmore, 2014). Training, use in daily life and exercising of the ROM of the hand most often also results in the improvement of grip strength.

Another useful technique is to heat the hand before exercising, this temporarily increases the ROM and can counteract the stiffness of the joints, which should only be done after the inflammatory stage passes.

A realisable end-goal of exercising is to reach the baseline of flexion set in the diagnosis stage. For extension, the optimum extension should be the main goal, often the surgeon mentions the extension measured right after surgery and is a goal to work towards.

#### **4.3.2.2 Oedema management**

Oedema starts building up as part of the inflammatory wound healing phase. It is a crucial part of fighting against the possible infection. Oedema's initial effect of fighting bacteria is positive, but the waste material lingers for too long. This impairs the range of motion of that area. Therefore, oedema managing is a good method of draining the oedema and allowing the hand to utilize its optimal ROM as soon as possible. It prevents the hand to have the chance to stiffen up. The goals for oedema management in the hand is to keep the oedema moving, and preferable to drain it towards the arm (Minnis, 2001).

Managing oedema starts immediately after surgery, as soon as the inflammatory phase initiates. The patient's hand will be elevated above the heart, to allow the body and gravity to drain it out of the hand. Another technique frequently used is to ask the patients to wiggle his fingers as much as possible, stimulating the body to drain the oedema (Minnis, 2001).

As the hand comes out of the surgical dressing, it becomes possible to physically drain the oedema towards the wrist, especially when the proliferative phase sets in and granulation of the wound starts. The goal here as a therapist is to teach the patient to drain his hand himself, massaging the oedema and pushing it towards the wrist exclusively. Self-management is important, as the patient will need to do this independently at home (Minnis, 2001). A good technique of motivating and convincing the patient of its usefulness is to measure the ROM before and after draining the oedema, most often the ROM increases and shows the effectiveness.

#### **4.3.2.3 Scar management**

Amini (2011) shows that scar management is an effective post-operative treatment of Dupuytren's disease. Scar management focuses on the manipulation of scar tissue created during the remodelling wound healing phase. As described, scar tissue hardens and tightens over time, limiting the range of motion of the affected area. By providing scar management, the therapist focuses on softening and stretching the scar tissue as it forms, allowing the patient to experience less limitation in his range of motion. This management is usually done during the start of the remodelling phase, starting from 2 weeks after surgery and lasting up to approximately 6 months. The therapist's role here is to teach the patient self-management, in order to be able to independently manage his scar at home.

Techniques of scar management are applying pressure and applying silicone gel sheeting. Pressure is based on massage on the scar, where moving the scar tissue prevents it from contracting and hardening. Applying enough and varied pressure is important for maximum effect. Silicone gel sheets are sticky sheet applied directly to a closed wound, which is forming scar tissue. The silicone in the sheet softens the scar tissue, ensuring minimum contraction and minimum range of motion impairment (Hegge, Henderson, Amalfi, Bueno, & Neumeister, 2011). These sheets are re-usable multiple times and most often worn during night-time, as the splint will help to keep it in place.

### **4.4 Personal Factors**

During treatment, personal factors should also be taken into account. Especially the patient's learning methods are important. Self-management is key, as almost all of the treatments are to be continued independently at home. Teaching the patient and making sure that he understands and is able to execute the treatment can be ensured by linking to the patient's learning methods (Sweet & Blackmore, 2014).

Often it is important to instruct the patient on the use of the treatments to be done at home. By not simply handing out exercises or massaging techniques, but acquiring the patient's understanding of the benefit of doing these, it can be ensured that the patient is motivated to do them at home.

Examples of subjects that could use such instruction are the splint wearing regime, desensitisation, exercises, oedema management and scar management.

Another important personal factor is promoting the patient's use of the affected hand in daily life, as this increases the range of motion of that hand. Some patients have the tendency to nurse the hand and keep it from being used, spotting and addressing this issue and convincing the patient to use his hand is beneficial to the therapist and the patient. An effective method to convince the patient could be to address earlier explained benefits, such as oedema drainage, prevention of stiffness and effective scar management.

#### **4.5 Environmental factors**

Environmental factors like the social context are of less influence with Dupuytren's disease, however especially with severe cases or during the immediate post-operative phase, this can be important. As the patient is temporarily one-handed, a lot of daily life activities become more difficult, discussing this beforehand can create awareness with the patient. Discussing that sensory problems may last a long time, particularly sensitivity to cold can also be beneficial. This enables the patient to arrange for help if not available and deemed necessary.

### **5. Discussion & recommendations for further completion**

Although viable and useful, this guideline was constructed under time pressure, in order to support a research report before it's deadline. Therefore the guideline has a lack of variety in sources and detail, compared to other finished guidelines. This guideline however provides a good overview for introducing and supporting occupational therapists in their treatment options and clinical reasoning at Dupuytren's disease treatment.

For further completion, this guideline should be expanded. Apart from variety in sources, recommendations could be isolated and ranked in levels of evidence for clarity. Details could be added about subjects such as the assessments that are addressed and splinting patterns which are discussed but are lacking examples. Finally some segments are based on personal experiences and need sources to either support or change the mentioned theories.

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## Appendix 6: W.A.S.P. Assessment Sheet

### W.A.S.P. framework structure

In order to assist in the assessment of skills, the W.A.S.P. (Witnessed, Assimilated, Supervised, and Proficient) framework can be used. The W.A.S.P. Framework is divided into four sections; i) action, ii) rationale, iii) W.A.S.P. assessment and iv) comments and progress record.

The W.A.S.P. assessment (see table below) is used for each competency and contains a scoring process which is used to assess progress.

|       |             |   |
|-------|-------------|---|
| W     | Witnessed   | Observe or witness the competency. It is considered good practice that the learner will have had the opportunity to observe an assessment prior to being supervised.  |
| A     | Assimilated | Understand the elements of the competency. Three essential elements, theory, practice and professional approach. Demonstrate sound knowledge base for the competency element, including relevant Trust Policies, and Professional and Legal issues relating to it. Assimilation of knowledge can be assessed through observation of practice, or through questioning/discussion/simulation of situations relating to the competency element if these particular situations have not arisen. |
| S     | Supervised  | Practice under supervision to demonstrate understanding. Score as follows:<br>1 needs further practice;<br>2 shows aptitude;<br>3 proficient.   |
| P     | Proficient  | Competent in knowledge and skill elements of the competency.  |
| Score | -           |   |

## Appendix 7: Literature Research

### Background:

The purpose of this literature research is to provide the main research with an overview of available literature & evidence, providing answers together with the information from the interviews, through the use of sub-questions.

The aim of this research is to make an efficient and effective evidence base for post-operative occupational therapy treatment of Dupuytren's disease.

The evidence is needed to create a guideline and a protocol for Raigmore Hospital occupational therapy department on post-operative treatment of Dupuytren's disease and providing support for training new occupational therapy staff and students for independent practice. Creating these products will be addressed in the final report.

In both its purpose and aim this research supports the main research question. The main research question is:

*Which requirements must be met when training new occupational therapy staff and students, to ensure they efficiently obtain the competencies needed for evidence based independent practice on patients in the post-operative phase of Dupuytren's disease with problems in hand function and self-management?*

The sub-questions are:

- 1- *Which competencies does an occupational hand therapist require for independent practice on patients with Dupuytren's disease in the post-operative phase?*
- 2- *Is there evidence that post-operative splinting improves the hand function of patients with Dupuytren's disease?*
- 3- *Is there evidence that instruction by an occupational hand therapist contributes to self-management for patients in the post-operative phase of Dupuytren's disease?*
- 4- *Which educational methods contribute optimally to training new occupational therapy staff and students for independent practice?*

## Method:

Evidence was searched in professional research libraries like Google Scholar, Pubmed, Cinahl, Medline, OT seeker, British/American/Canadian Journal of Occupational Therapy and the British Journal of Hand Therapy. Searches were also done in Knowledge Network, a search engine provided by National Health Services (NHS) education, able to search all previously mentioned databases at once. All search terms used were listed in appendix 7.2, but main searching terms were Dupuytren's, Treatment, Assessment, Instruction, Education, Splinting and Occupational Therapy. The search terms were combined using operators "AND", "OR" & "NOT" in order to efficiently control the relevance and amount of results a search provided. The screening of articles and choices of combining search terms were done by title and abstract. The article was screened on content and according to the PRISMA group's flow diagram and checklist afterwards, found in appendix 7.4 & 7.5 (Moher, Liberati, Tetzlaff, & Altman, 2009). The search history was documented and listed in appendix 7.3. Several criteria needed to be met to be able to select an article. If deviations of these criteria occurred and the article was still used, this was stated & explained accordingly (Kuiper, Verhoef, de Louw, & Cox, 2008).

The article had to be:

- a. recent, no older than the year 2000.
- b. either Dutch or English.
- c. the highest evidence level possible.
- d. relevant to the research questions, by title and abstract.
- e. provide evidence relevant to the research questions, by content.

Articles were analysed and summarized for each sub-question. Finally, conclusions were drawn.

## Results:

This literature search resulted in 30 articles; nine were evidence level I, eighteen evidence level II and three evidence level III.

### ***Dupuytren's disease and its implications***

Dupuytren's is an affliction which causes the fascia in the palm of the hand to harden and form scar tissue nodes. These nodes grow and connect, forming cords. These cords often spread and branch out into the fingers. Most affected are the little- and ring finger (Rayan, 2007). They harden up over time and start to tighten and shrink. This causes the fingers to pull towards the palm of the hand, resulting in an inability to fully stretch the fingers (Townley, Baker, Sheppard, & Grobbelaar, 2006). There is currently no cure, only surgeries that improve the contracture, but the patient will potentially face further surgery after some years (Werker, Press, van Rijssen, & Denkler, 2012). Dupuytren's impairs patients in their daily life in an advanced stage. Occupational Therapy can contribute to improving quality of life of Dupuytren's patients with splinting and exercises (Thoma et al., 2014). The most reported daily life problem is functional decrease, where patients have trouble gripping items and wearing gloves. Other reported problems are dangers from catching fingers, maintaining personal hygiene, self-consciousness and an uncertainty of further progression through a lack of information (Pratt & Byrne, 2009; Engstrand, Borén, & Liedberg, 2009). The cause for Dupuytren's is unknown, although a genetic factor does seem to effect the prevalence, as Dupuytren's is most often reported in north-European countries. Dupuytren's most often occurs in men of 50 years or older. Prevalence numbers fluctuate per region. The prevalence of Dupuytren's increases in patients with Diabetes and Frozen Shoulders (Hindocha, McGrouther, & Bayat, 2009). The literature demonstrates the unique nature, progression & implications of Dupuytren's. It is important for practitioners to have an understanding of these facts when undertaking treatment.

### ***Competencies for independent occupational therapy practice on Dupuytren's disease***

A seminal piece of work by Shimeld & Weed (1982) reports that general key areas of professional practice are: "credentialing" (p. 54), auditing, utilization review, clinical activities and continuing education. These key elements must be taken into account in order to be able to assure quality of care as a practitioner. Credentialing focuses on ensuring the practitioner has the right credentials for the position, or is willing to acquire these. Auditing focuses on reflection and evaluation of the practitioner. Utilization focuses on efficiency of the practitioner, examples are use of time, materials, services and how referrals are handled. Clinical activities is meant for the assessment of clinical programs and reviewing problems that occur, creating an acceptable standard of practice. Continuing education focuses on keeping the practitioner up to date on his/her education. These are key elements for assuring quality in overall independent practice and can also be applied to post-operative treatment of Dupuytren's (Shimeld & Weed, 1982). These key elements can be considered competencies required for medical independent practice.

Occupational Therapy interventions on a functional level aimed towards the hand, wrist and forearm can return patients with such to full occupational engagement. Research by Amini (2011) supports the usefulness of these multiple interventions, which are the competencies needed for independent occupational therapy practice on patients with hand, wrist and forearm injuries. Specification is required for Dupuytren's disease.

Bielecki & Wysocki (2011) posited that post-operative treatment by a handtherapist on Dupuytren's patients can enhance the surgical outcome. The most important areas in hand therapy after surgery specifically for Dupuytren's disease include: early detection of potential postoperative complications, including disturbances in wound healing; oedema control; scar management; maintenance of surgical correction & restoration of finger flexion. They also report a handtherapist should see the

patient immediately after removal of surgical dressings to give advice on active mobilization (Bielecki & Wysocki, 2011).

Specific competencies required for treatment of Dupuytren's can be selected by combining the articles by Amini (2011) and Bielecki & Wysocki (2011). These competencies are: techniques for increasing range of motion, wound healing management, measuring of functional outcome, silicone gel sheeting, massage, splinting, using function based activities & sensory re-education.

All these findings allow for the creation of a competency list for independent occupational therapy practice on Dupuytren's disease.

### ***Post-operative splinting with Dupuytren's disease and its effect on hand function***

Although post-operative splinting to counter extension deficits is considered a standard intervention, a systematic review by Larson & Jerosch-Herold (2008) shows there is little high level evidence available to support its functionality. Recent articles suggest post-operative splinting for Dupuytren's provides no benefit when the patient receives instructions and exercises during post-operative care (Huisstede, Hoogvliet, Coert, & Fridén, 2013; Kemler, Houpt, & van der Horst, 2012; Jerosch-Herold, Shepstone, Chojnowski, Larson, Barrett, & Vaughan, 2011; Collis, Collocott, Hing, & Kelly, 2013). The systematic review by Larson & Jerosch-Herold (2008) provides insight on the articles available on post-operative splinting of Dupuytren's, contrasting articles for contemporary splinting to those against post-operative splinting. This review showed articles demonstrating no benefit in post-operative splinting are of a higher evidence level. Post-operative splinting can help when a contracture occurs of 15° or more in the proximal interphalangeal joint and/or 20° or more in the metacarpophalangeal joint after the first week (Jerosch-Herold et al., 2011). Another use for splinting with Dupuytren's is to delay surgery (Larocerie-Salgado & Davidson, 2012). Post-operative splinting can even increase complications during early wound healing by putting unnecessary mechanical stress on the extension (Evans, Dell, & Fiolkowski, 2002).

### ***Effect of occupational handtherapy on self-management for patients in the post-operative phase of Dupuytren's disease***

Bielecki & Wysocki (2011) report that an occupational handtherapist should see the patient immediately after removal of surgical dressings to give advice on active mobilization. Seeing the patient directly after removal of dressings enables the occupational therapist to instruct the patient on a home program, so the patient can do self-treatment at home and the time frame of certain goals should be discussed. This method saves both money and time and allows the patient to get an understanding of his own progression (Sweet & Blackmore, 2014). A study also suggests patients with Dupuytren's disease know too little about it to be able to make informed decisions on their treatment, resulting in uncertainty of progression. Informing the patients about Dupuytren's will increase their self-management, because they have more understanding of progression, surgical treatments, post-operative rehabilitation & features of the disease (Pratt & Byrne, 2009). If the patient doesn't meet the set goals in the set time-frame it is advised to review the home program and follow up directly (Sweet & Blackmore, 2014).

### ***Training new occupational therapy staff and students for independent practice***

Many occupational therapy educations focus on evidence based practice, however as reported by students, this educational methodology does not fully address the essential practical and pragmatic decision making needs of practitioners (Tomlin & Borgetto, 2011). The need for education when transitioning to practice is a recurring theme for occupational therapy students (Roberts, Hooper, Wood, & King, 2015). Educating occupational therapists and students in qualitative inquiry prepares them for independent practice beyond making decisions based on evidence. Training (future) occupational therapists in qualitative inquiry helps them in thinking, performing and acting with integrity, for more professional decision-making and forming positive practice habits. Positive habits mentioned are reflection, reflexivity, being critical and being actively engaged (Marterella & Aldrich, 2014).

Research shows linking theory to practice during occupational therapy education is advised to increase students' and newly graduates' confidence and that theoretical knowledge provides credibility towards other professionals (Hodgetts, Hollis, Triska, Dennis, Madill, & Taylor, 2007). Sharing insight between other professions is beneficial for knowledge & abilities for practice obtained by students and makes students more willing to collaborate. Interprofessional education lets students develop competencies for delivering quality care, gain knowledge of other professions and develop a professional identity (Dubouloz, Savard, Burnett, & Guitard, 2010).

## Discussion:

The research provides evidence to be able to create a list of competencies needed for specific independent occupational therapy practice on patients with Dupuytren's disease.

Recent articles suggest post-operative splinting on Dupuytren's is unnecessary in most cases, if the patient receives additional post-operative occupational handtherapy, and can even increase the chance of complications. A lack of research in revision and duration procedures of not splinting makes it difficult to currently adopt this method as the new standard.

The evidence shows the importance of post-operative occupational therapy on Dupuytren's patients and the fact that it enhances surgical outcome. A home program is promoted to provide patient-education on post-operative Dupuytren's disease in the first treatment, this allows the patient to self-manage at home and this saves time and costs to health organisations.

The research shows there is room for improvement in occupational therapy education, it often does not cover teaching practical and pragmatic decision-making during practice, a recurring theme for occupational therapists transitioning to practice. Training in qualitative inquiry proves to be a promising method to improve this. Other evidence provides more key points contributing to efficient contemporary educational methods.

The limits of this study apply mostly to the amount of Dupuytren's research available. There are limited amount of articles available on post-operative therapeutic treatment differences between specific surgeries, causing the term "post-operative" to be broad and generic. There are also limited articles on the impact of specific interventions, causing an unclear image of when splinting is beneficial, when it is not and what alternative interventions could be used (Amini, 2011; Sweet & Blackmore, 2014). Only the research of Jerosch-Herold et al. (2011) provided precise numbers on when a splint should be considered, but these numbers were unfounded by evidence and used out of ethical necessity of the trial.

The article by Shimeld & Weed (1982) is older than allowed, but is still used because it is a seminal piece of work, which is not bound to change much over the years.

The reflexivity of the researcher was discussed as part of the evaluation process as recommended by Finlay (2002) "researchers can use reflexivity explicitly as part of their methodological evaluation, as a way of demonstrating trustworthiness." (p. 543). Reflexivity also provides a method of addressing research rigor and the issue of researcher objectivity (Sin, 2010).

Compared to the research proposal, one research question is dropped, because the answer comprised more of repetition than new information and because the same information would return in the conclusion.

Further research is recommended on post-operative therapeutic treatment differences between specific surgeries, the impact of specific intervention types and revision and duration procedures of splinting.

## Reflexivity:

Reflexivity is defined as “a strategy that makes explicit the deep-seated views and judgements that effect the research process” (Carpenter, 2010, p. 131; Macgregor, 2015). It is appropriate for me to document my account of reflexivity during the research in first person (Finlay, 2003).

As a student my main goal is to complete and pass my thesis and meet the demands of my university, but also to have a topic relevant to my placement. The Dupuytren’s topic motivates and interests me due to my natural interest in occupational hand therapy. Initially I wanted it to be more focused on the best method of treating Dupuytren’s post-operatively, but the placement had a need for staff education on this subject. My initial focus originates out of my previous placement, where they are really interested in the best method of treating Dupuytren’s post operatively.

I am satisfied with the current research, since it still covers part of my initial idea and also offered me some great insight in methods of developing myself when I transition to practice.

## Conclusion:

This research provides support for the thesis by answering all sub-questions. Enough evidence is collected to complete the aim of this research to start the creation of a guideline for post-operative occupational therapy treatment of Dupuytren’s disease and incorporate these in an effective and efficient training method for new occupational therapy staff and students for independent practice.

Further research should focus on providing specific information for Raigmore Hospital occupational therapy department, to complete an effective and efficient protocol and training program designed for them. The current results are generic and could be applied anywhere.

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## Appendix 7.2: Search terms/mesh terms

| <b>Search terms:</b>          | <b>Alternative terms for that word:</b>                                       |
|-------------------------------|---|
| Assessment                    |   |
| Checklist                     | Article checklist, review checklist   |
| Collagenase                   |   |
| Competencies                  | Requirements, competence  |
| Daily life                    | Daily Living  |
| Dupuytren's disease           | Dupuytren's, Vikings disease, Dupuytren's, Dupuytren, Dupuytren's contracture |
| Educational methods           | Teaching methods, training method, instruction method, schooling, education   |
| Etiology                      | Prevalence  |
| Exercise                      | exercises, training   |
| Guide                         | Tool  |
| Guideline                     |   |
| Hand function                 | Range of Movement, Sensitivity, strength, force                               |
| Hands                         | Hand  |
| Independent practice          |   |
| Instruction                   | Education   |
| Occupational (hand) therapist | Occupational therapist, hand therapist  |
| Occupational Performance      |   |
| Occupational therapy          | Hand therapy  |
| Optimum results               | Best results, effect  |
| Patients                      | Clients   |
| Post-operative                | After surgery   |
| Prevalence                    |   |
| Protocol                      |   |
| Quality of care               |   |
| Quality of life               |   |
| Reflexivity                   |   |
| Rehabilitation                |   |
| Research                      | Qualitative research  |
| Self-management               |   |
| Splinting                     | Splint, Splintage   |
| Treatment                     | Advice, Intervention, Treatments, Advices, Interventions                      |

## Appendix 7.3: Search history

| Search Terms                             | Library        | Number of hits | Relevant hits | Used hits/articles   |
|--|----------------|----------------|---------------|----------------------|
| dupuytren's                              | Pubmed         | 2129           | 200+          | 1 (Rayan)            |
| dupuytren's AND protocol                 | Pubmed         | 9              | 6             | ?                    |
| dupuytren's AND guide                    | Pubmed         | 5              | 2             | ?                    |
| Fasciotomy AND Dupuytren's               | Pubmed         | 64             | 51            | <del>1 (Eaton)</del> |
| Fasciotomy AND collagenase               | Google scholar | 684            | 20+           | 2 (Townley)(Werker)  |
| Dupuytren's AND daily life               | Pubmed         | 2              | -             | -                    |
| Dupuytren's AND daily living             | Pubmed         | 8              | 6             | 1 (Engstrand)        |
| Dupuytren                                | Cinahl         | 10             | -             | -                    |
| Dupuytren's                              | Cinahl         | 92             | 76            | 1 (Pratt)            |
| dupuytren's contracture AND prevalence   | Pubmed         | 211            | -             | -                    |
| Dupuytren's AND prevalence AND etiology  | Pubmed         | 125            | 37            | 1 (Hindochoa)        |
| Dupuytren's                              | Otseeker       | 3              | 2             | -                    |
| Hand AND quality of life                 | Otseeker       | 63             | -             | -                    |
| Quality of life AND hands                | Pubmed         | 4977           | 60+           | 1 (Thoma)            |
| occupational performance AND dupuytren's | Pubmed         | 1              | -             | -                    |
| Occupational performance AND hands       | Pubmed         | 1016           | -             | -                    |
| Occupational AND performance AND hands   | Pubmed         | 1016           | -             | -                    |

|   |  |         |      |   |
|---|--|---------|------|---|
| Occupational performance AND dupuytren's                    | Otseeker   | 0       | -    | -   |
| Occupational performance AND dupuytren                      | Otseeker   | 0       | -    | -   |
| Occupational performance hand                               | Otseeker   | 24      | -    | -   |
| occupational performance AND dupuytren's                    | Google Scholar                                   | 1080    | 1    | 1 (Engstrand)   |
| Competencies AND dupuytren's                                | British Journal of Occupational Therapy          | 0       | -    | -   |
| Dupuytren's   | British Journal of Occupational Therapy          | 21      | -    | -   |
| Dupuytren's   | American Journal of Occupational Therapy ( AJOT) | 5       | -    | -   |
| Dupuytren   | AJOT   | 5       | -    | -   |
| Search in "topic" of AJOT. Topic = hand and upper extremity | AJOT Topiclist                                   | 140     | 1    | 1 (Amini)   |
| Dupuytren   | Canadian Journal of Occupational Therapy (CJOT)  | 7       | 1    | 1 (Shimeld)   |
| Hand  | CJOT   | 1312    | 30+  | 2 (Roberts) (Marterella)  |
| Splint  | CJOT   | 187     | -    | 1 (Hodgetts)  |
| article checklist systematic review items                   | Google Scholar                                   | 125.000 | 30+  | 1 (Moher)   |
| Splinting   | Pubmed   | 3093    | 100+ | 5-  |
| Splinting AND Dupuytren                                     | Pubmed   | 24      | 18   | 6 (huisstede)(Kemler)(Iarocrie-salgado)(Jerosch-herold)(Larson) |
| Splint AND Dupuytren  | Pubmed   | 47      | 30+  | 1 (Evans)   |

|                                      |                   |      |      |                                 |
|--------------------------------------|-------------------|------|------|---------------------------------|
| Splint and Dupuytren                 | Medline           | 3    | 3    | -                               |
| Dupuytren                            | Medline           | 2    | 2    | -                               |
| Reflexivity                          | Knowledge Network | 1206 | 100+ | -                               |
| Reflexivity AND Finlay               | Knowledge Network | 7    | 7    | 2 (Finlay, 2002) (Finlay, 2003) |
| Reflexivity AND research             | Knowledge Network | 702  | 100+ | -                               |
| Reflexivity AND qualitative research | Knowledge network | 317  | 50+  | -                               |
| Dupuytren's AND interventions        | Knowledge Network | 23   | 10   | 1 (Sweet, 2014)                 |
| Dupuytren's AND treatment            | Knowledge Network | 236  | 40+  | 1 (Bielecki, 2011)              |
| Dupuytren's AND competencies         | Knowledge Network | -    | -    | -                               |
| Dupuytren's requirements             | Knowledge Network | 3    | -    | -                               |
| Dupuytren's AND competence           | Knowledge Network | 4    | -    | -                               |
| Dupuytren AND assessment             | Knowledge Network | 70   | 20+  | -                               |
| Dupuytren's AND self-management      | Knowledge Network | 3    | -    | -                               |
| Dupuytren AND self-management        | Knowledge Network | 3    | -    | -                               |
| Dupuytren AND Therapy                | Knowledge Network | 353  | 30+  | -                               |
| Dupuytren's AND therapy              | Knowledge Network | 241  | 30+  | -                               |
| Dupuytren's AND Therapy AND Effect   | Knowledge Network | 34   | 17   | 1 (Collis)                      |
| Dupuytren's AND Therapy AND Result   | Knowledge Network | 11   | 4    | -                               |

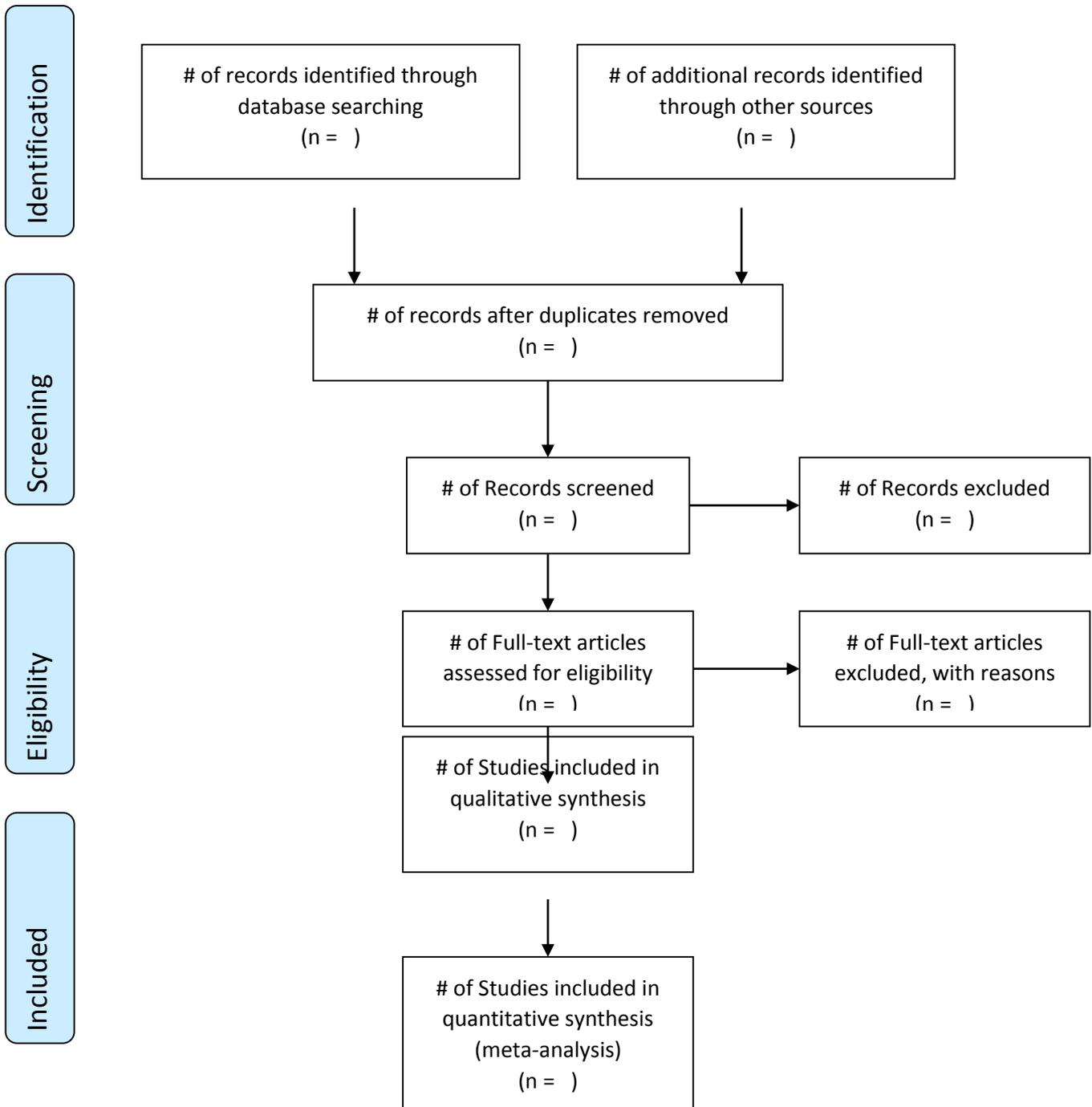
|                                      |                   |    |     |   |
|--------------------------------------|-------------------|----|-----|---|
| Dupuytren's AND Therapy AND outcome  | Knowledge Network | 78 | 20+ | - |
| Dupuytren's AND post-operative       | Knowledge Network | 4  | 4   | - |
| Dupuytren's AND occupational therapy | Knowledge Network | 10 | 6   | - |
| Dupuytren's and Rehabilitation       | Knowledge Network | 36 | 20+ | - |

Found through snowballing method:

- 6- (Tomlin et al., 2011)
- 7- (Dubouloz et al., 2010)
- 8- (Sin, 2010)
- 9- (Carpenter, 2010)

# Appendix 7.4: The PRISMA 2009 FLOW Diagram

## PRISMA 2009 Flow Diagram



## Appendix 7.5: The PRISMA Checklist

| Section/topic                      | #  | Checklist item  | Reported on page # |
|------------------------------------|----|---|--------------------|
| <b>TITLE</b>                       |    |   |                    |
| Title                              | 1  | Identify the report as a systematic review, meta-analysis, or both.   |                    |
| <b>ABSTRACT</b>                    |    |   |                    |
| Structured summary                 | 2  | Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria; participants; and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number. |                    |
| <b>INTRODUCTION</b>                |    |   |                    |
| Rationale                          | 3  | Describe the rationale for the review in the context of what is already known.  |                    |
| Objectives                         | 4  | Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).  |                    |
| <b>METHODS</b>                     |    |   |                    |
| Protocol and registration          | 5  | Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.   |                    |
| Eligibility criteria               | 6  | Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.  |                    |
| Information sources                | 7  | Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.  |                    |
| Search                             | 8  | Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.   |                    |
| Study selection                    | 9  | State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).   |                    |
| Data collection process            | 10 | Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.  |                    |
| Data items                         | 11 | List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.   |                    |
| Risk of bias in individual studies | 12 | Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.  |                    |
| Summary measures                   | 13 | State the principal summary measures (e.g., risk ratio, difference in means).   |                    |
| Synthesis of results               | 14 | Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I <sup>2</sup> for each meta-analysis).   |                    |
| <b>RESULTS</b>                     |    |   |                    |
| Risk of bias across studies        | 15 | Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).  |                    |
| Additional analyses                | 16 | Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.  |                    |
| <b>RESULTS</b>                     |    |   |                    |
| Study selection                    | 17 | Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.   |                    |
| Study characteristics              | 18 | For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.  |                    |
| Risk of bias within studies        | 19 | Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).   |                    |
| Results of individual studies      | 20 | For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.  |                    |
| Synthesis of results               | 21 | Present results of each meta-analysis done, including confidence intervals and measures of consistency.   |                    |
| Risk of bias across studies        | 22 | Present results of any assessment of risk of bias across studies (see Item 15).   |                    |
| Additional analysis                | 23 | Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).   |                    |
| <b>DISCUSSION</b>                  |    |   |                    |
| Summary of evidence                | 24 | Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).  |                    |
| Limitations                        | 25 | Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).   |                    |
| Conclusions                        | 26 | Provide a general interpretation of the results in the context of other evidence, and implications for future research.   |                    |
| <b>FUNDING</b>                     |    |   |                    |
| Funding                            | 27 | Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.  |                    |

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med* 6(8): e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: [www.prisma-statement.org](http://www.prisma-statement.org)

## Appendix 8: Interviews staff & students

*This interview will be about your OT experience, your knowledge of Dupuytren's disease & your preferred method of learning. The goal of this interview is to support the dissertation about Dupuytren's. The end products of the dissertation will be a protocol for Raigmore on treating Dupuytren's & means to train and assess new students and band 5 staff on treating Dupuytren's. There are no right or wrong answers, the answers you give are meant to form a baseline on the knowledge a student or band 5 staff has on Dupuytren's and what needs training and what does not. Therefor the interview will be divided in three parts; experience, knowledge & learning.*

*This is the first part, about your OT Experience*

Do you have any experience in occupational therapy practice, if yes, what experience?

Do you have any experience in hand therapy, if yes, what experience?

Do you have any experience in treating Dupuytren's, if yes, what experience?

*This is the second part, about your Knowledge of Dupuytren's disease*

What do you know of Dupuytren's?

What competencies do you think you will need for occupational therapy treatment on Dupuytren's?

*Next follows a list of elements needed for treating a patient with Dupuytren's disease, these questions are meant to check if you know anything about specific parts of occupational therapy treatment of Dupuytren's disease.*

What do you know of splinting?

What do you know about training grip strength?

What do you know about scar healing & scar management?

What do you know of treating range of movement?

What do you know about treating oedema?

What do you know about nerve healing and treatment on sensitivity?

What competency/element would you like to have the emphasis on during training on Dupuytren's?

*This is the final part, about your Learning*

What is your own preferred method of learning new information?

Do you prefer practical or theoretical training?

How would you like to make sure you don't forget anything you're taught? (notes/hand-outs) and what do you like about this method?

Have you got any experience with a training/education method that you liked? If yes, why?

Have you ever been assessed before and how did you get the results of the assessment? Did you like this method of handing out results?

Have you got any suggestions on a method of training that you'd like for treating Dupuytren's?

## **Summaries:**

### **Interview 1: Student A**

The student has had 2 placements giving her experience in occupational therapy. They were both in orthopaedics. Varying between elective and trauma OT. She didn't do anything in hand therapy herself up till now. She did see one of her supervisors making a hand splint once. She has had no experience in treating Dupuytren's but the splint from her supervisor was intended for a Dupuytren's patient, but that was very brief.

Her knowledge of Dupuytren's is quite okay. She heard about it and describes it as a disease in the tendons of the hands, which curls the fingers in. This makes the hand look like a claw. She knows it can be treated with surgery and that a splint follows for the night time. When she's asked about what she feels she needs to know more about before treating Dupuytren's, she says a deeper understanding of what the disease actually is would help a lot. The causes and effects are also important. And finally she thinks methods of treatment need to be trained last, so she knows what to do and why. Her knowledge of splinting is limited. She has only seen the one splint being made, and didn't receive a lot of explanation about it at the time. She has no experience and knowledge in training grip strength & scar management. She did get some education from her university about range of movement and what it is, but no practical information about treating it. She has had no experience or knowledge about treating oedema & nerve damage/sensitivity. The most important part if she would be trained in treating Dupuytren's is understanding the disease.

When she is learning she writes notes and summarizes what she needs to learn. She also prefers visual instructions which help her understand the theoretical information. She prefers practical training because it's easier to remember the information afterwards. To make sure she won't forget any theoretical information provided, she would like to be able to revise the information and go over it again. She experiences practical training as quite helpful, because it's hands-on and you can see what you do wrong and change it as you go along. She also likes it when an example is set, so you can see what to do and copy it, providing her with feedback on the spot. At her university she got some formal assessments. The results were shared with her online. She feels this could be better, because you can't ask questions at online text. Face-to-face feedback would be her preference, so you can talk about what happened with your trainer. The online feedback is quick, but leaves quite a lot of questions, face-to-face would not. Her suggestions on the method of training she would like for Dupuytren's is mostly practical, but it needs a theoretical introduction on what the disease is, to understand why you are doing what you do.

## **Interview 2: Student B**

This student has had 3 OT placements which gave him practical experience. The first two were in community occupational therapy, focussing on mental & physical health of the community. The one he is currently on is in a hospital, where he works on the stroke unit. He is now able and required to treat his own patients. He didn't come across actual hand therapy yet, but did see someone with nerve damage getting a splint on her hand to alleviate the pressure on the nerve in the wrist. He did not ever come across patient with Dupuytren's disease.

When asked what he feels is most important if he would get trained in treating Dupuytren's is the theory behind what you're doing and why you're doing it. Because it's important that you can tell the patient what is going on as well. He has seen splinting being done once, and saw a splint bath being used. It was a splint to free the nerves of the wrist. That is all his experience in splinting and would like to know more about it. He has no experience with training grip strength & scar healing. He did have experience with improving range of movement. He is used to stroke patients with either high or low tone in their arms and/or hands. Low tone patients have a high active & passive range of movement his goal here is to do the movement with them. Patients with high tone have a low active & passive range of movement, his goal there is to lower the tone before initiating any movements. He has had no experience in treating patients with oedema before. He has had experience with patients with nerve problems, for example the patient who got the splint to free the nerves in the wrist. He knows that nerves can be damaged by putting too much pressure on it, like a flexed wrist for example. When asked which treatment competency he sees as most important to learn he picks splinting. If you get the splinting wrong, everything else is useless as well and you lost all credibility with the patient.

His preferred method of learning is to learn through experience, not theoretical learning. He likes the visual aspect of practical learning. Seeing what needs to be done, and get it explained and then do it yourself and get the feeling for it straight away. If he does learn theoretically because there's no other option he prefers to make mind maps, to see the connections to all things that he needs to learn. He had practical training before and as an example he gives manual handling training at his university. This was preceded by a lecture & immediately after he got a practical training. This training is done every year with more detail, so each year his proficiency in manual handling is improved. Feedback given during the training is done ongoing, so as you're doing it if that's the correct method and the safest method for the training. This allows you to adjust you're technique right away, so that you never get used to the wrong method. This direct feedback has his preference. If he needed to learn to treat Dupuytren's now he would like to get educated on it first, and then observe and ask questions as the trainer treats a patient. Then after he would try a treatment on his own, as he gets direct feedback from the trainer.

### ***Interview 3: Band 5 Occupational Therapy staff Z***

This staff member had had previous experience in a community hospital, in an orthopaedic ward and the surgical wards. Her placements in school were a stroke placement, mental health rehabilitation unit, homeless daycentre and a hospice. She hasn't had experience with hand therapy yet, although the hospital she works in now does have a hand therapy service. She has come across Dupuytren's disease before, so she has a minor understanding of what it is. She has never had to treat it.

When asked about what she knows of Dupuytren's, she describes it as a contracture of the middle and the ring finger and that it gives quite some functional difficulties which also affects day-to-day business. She has no idea how to treat Dupuytren's and what competencies could go along with it. When asked about separate parts of the treatment so does have some knowledge. She has had experience with splinting before, consisting of a workshop at her university at which she learned the basics. She also has had some experience with training grip strength and doing hand exercises, mainly using putty. She has had no experience in treating scars or educating patients in scar management. Training range of movement is something she does do a lot at the stroke unit, focusing on hand-eye coordination and making use of specific activity based goals. She hasn't has experience with treating oedema directly, but she has had experience with the consequences of oedema. She does know about necessary elevation to reduce the swelling. She has some knowledge of sensory re-education, but no experience. Especially the dangers of not being able to feel anything is what she is aware of, examples give are the dangers of using a kettle and a candle. If she was to be trained in Dupuytren's she would prefer the emphasis to be on training range of movement, because she thinks the most important part of the treatment is battling the contractures.

Her preferred method of learning is practical learning, where she prefers to see it first before given the opportunity to try it herself. She does recognize the value of theoretical learning, but feels that having direct experience is the best way of learning. If she wants to make sure that she doesn't forget anything that she is taught she would want to write the information down somewhere or possible record it. Her most useful form of practical training she has had is her placement, where she got to see complex and real cases as they actually were. She prefers feedback to be given verbally & directly, either positive or negative to be able to develop and change things as she goes along. When asked for suggestion on how she would like to be trained on Dupuytren's right now she would prefer a mixture of theory and practice to be able to understand why she would do certain practical interventions.

#### ***Interview 4: Band 5 Occupational Therapy staff Y***

This staff member currently works as an occupational therapist in orthopaedics as her first post, but she previously had occupational therapy placements during her education, one in mental health, care of the elderly and in drug and alcohol abuse. During all these experiences she never came across hand therapy treatment. Therefore, she also has no experience in treating Dupuytren's disease.

When describing her knowledge about Dupuytren's disease she doesn't know anything about the overall disease. When asked about specific elements she has knowledge about treating range of movement. Although she doesn't assess this personally, she does closely work with physiotherapists who do this. She hears about it through this method and often sees them working based on the patient's muscle tone and helping them practice through their full range of movement. However she doesn't know much about the theory behind this. About all other elements involved in treatment of Dupuytren's disease discussed, she doesn't know anything else. When asked what element she would like the emphasis on during training, she replies that she prefers to have the general knowledge of Dupuytren's first of all, after which everything else would be picked up faster through understanding the use of it.

Her preferred method of learning and storing information is writing things down over and over again until it is ingrained in her head, but she needs to have interest in the subject for motivation in order to grasp it quicker. She does however express a preference to practical learning, because she is able to remember that information better due to its 'activeness'. In order to ensure not forgetting information taught to her, she would prefer to make her own notes and also to receive a handout. She likes this mix because her own notes are more understandable when read by herself, but the handout gives the assurance that all knowledge distributed is present. The hard-copy of facts is a better source, but her own notes make her better remember and interpret the situation in which she learned it. Her experiences with being trained in this post consist of re-occurring five minute talks to refresh everyone's memories on certain subject. She likes this method, depending on what it is for, as some subject could require longer than five minutes. Assessments done during her education are reflective, she did not really get graded. However after placements she did get feedback, both verbally and in a report. As a method of feedback she preferred both methods (verbal and a report) together. This is because written feedback makes it hard to tell how someone means certain feedback, but it does allow her to look back on the feedback later. By verbally discussing feedback she gets the opportunity to ask questions about it and understand the feedback. Finally, when asked about suggestions on a form of training about Dupuytren's that she would like, she would like a PowerPoint® or theoretical intro combined with a hand-out for later reference. However practical training would be more beneficial after having basic understanding of the disease for direct training, since direct feedback is possible.

### ***Interview 5: Band 5 Occupational Therapy Staff X***

This staff member has worked in this department since qualification, but she has been in the orthopaedics, surgical, amputees and stroke, acute medical and community rehab post. However during this time she has had no experience with performing hand therapy. However on the stroke unit she saw quite a lot of hand therapy being done, where people would get assessed and recommended for splints. Also any hand therapy that could be done in the wards would be carried on, an example is massaging patients with a high tone. She also came across patient's suffering from Dupuytren's disease, but never really had to treat it. She is familiar with the impact the disease can have on her own treatments as well as the patient's daily life, for example one patient had to use a transport lift for transferring but couldn't quite hold it due to Dupuytren's in both hands.

She knows the basic knowledge of Dupuytren's, she describes the fact that there are surgeries which offer no cure but provide correction for a limited amount of time. She describes the disease as tendons which contract and curl the fingers in towards the palm. When asked about OT treatment of Dupuytren's she knows that the OT makes splints but doesn't know the details about that and couldn't tell much about other treatment involved. Of splinting she knows that it's used for positioning people's hands and that it is based on "the healing stage of certain things". There are also dynamic splints for exercising but she is not clear if those are needed for Dupuytren's disease treatment. She doesn't know anything about training grip strength. She knows that scar healing can be influenced positively by massaging the scar. She has no knowledge of range of movement treatment, apart from splints being used to influence it. She has basic knowledge of oedema management, such as hand positioning above the heart and massaging. She has no knowledge of nerve healing. She would prefer the emphasis of training to be on all of the elements overall, but range of movement, including splinting, seems to be the most functional result in order to get the patient active as quick as possible.

Her preferred learning method is an active method, she likes to practically try things out. She prefers to see someone setting an example before she tries it out. In order to remember information that she was taught, she would like to repeat and execute the information repeatedly, but if the time between practical exercise occasions is too big, she would write down what she was taught. She prefers teamwork as a method of training, being able to dynamically discuss information as she goes. Written information is useful for referring back to it, but she would have trouble to learn and internalize the information from solely that. She was often assessed during school, the feedback was provided in text. She prefers to have the opportunity to also be able to ask questions about the feedback, in order to clarify what she could improve if necessary. Finally, her suggestion for a training method was to set-up a practical case-study based on dynamical teamwork, in order to discuss what to do and why as its being done.

### ***Coding & results of staff & student interviews:***

Before making conclusions about all interviews, coding is required for efficient analysis. Coding the interviews makes for an efficient overview of the results to ensure for effective and complete conclusions to be drawn. The method used for coding was a three step method as described by Brent & Slusarz (2003). This involves 'open coding' (p. 285), which creates and links codes to segments of the fieldnotes and interview for categorisation. This is followed by 'axial coding' (p. 285), which connects and divides codes to categories and links these together to offer contextualisation. Finally, 'selective coding' (p. 285) allows the research codes to be compared and contrasted for analysis by looking at selective key themes. These key themes can then be used for the descriptive narrative of the report (Brent & Slusarz, 2003)

#### **Open coding:**

##### *Codes created based on Interview questions:*

Student  
Junior staff  
Experience  
OT experience  
Hand therapy experience  
Dupuytren's treatment experience  
Knowledge  
Splinting  
Training grip strength  
Scar healing & scar management  
Treating range of movement  
Treating oedema  
Nerve healing and treatment on sensitivity  
Emphasis during training on Dupuytren's  
Learning  
Preferred method of learning new information  
Preference: practical or theoretical training  
Methods for remembering theory  
Training/education method preferred  
Assessment  
Feedback preference  
Method of training suggestions

Codes created based on the interviews,  
anything positive mentioned was coded:

Student  
Placements  
Orthopaedics  
Tendon disease  
Curling in of fingers  
Surgery  
Splinting  
Splinting regime  
Background/basic knowledge  
Causes and effects  
Educational preference (theoretical/practical)  
Range of movement  
Emphasis on knowledge required  
Writing notes  
Practical instructions  
Ability to revise information  
Flexibility during practical training  
Feedback  
Face-to-face feedback  
Practical training with theoretical introduction  
Student  
Placements  
Community OT  
Stroke unit  
Nerve damage treatment  
Emphasis on background theory  
Patient education  
Splinting  
Range of Movement  
Nerve damage  
Emphasis on splinting  
Practical learning  
Visual learning  
Theoretical introduction before practical education  
Direct feedback & adjustments  
Junior Staff  
Community hospital  
Orthopaedics  
Surgical  
Stroke unit  
Mental health rehabilitation  
Homeless daycentre  
Hospice  
Dupuytren's disease  
Contracture of middle and ring finger  
Functional difficulties  
ADL difficulties  
Splinting  
Training grip strength

putty  
Range of movement  
Activity based goals  
Oedema management  
Nerve damage (danger of)  
Emphasis on Range of movement  
Practical learning  
Experience  
Writing notes  
Recording  
Cases for practice  
Verbal & direct feedback  
Suggestion on training: mix of theory and practice  
Junior Staff  
Orthopaedics  
Mental health  
Care of the elderly  
Drug and alcohol abuse  
Range of movement treatment  
Physiotherapy  
Emphasis on background knowledge of Dupuytren's  
Writing down notes for remembering  
Practical training  
Notes written down for own understanding  
Handouts for hard-copy of facts  
Presence of all knowledge in hand-out  
5 minute talks  
Verbal & written feedback mix, for reference and questions  
Suggestion on training: theoretical introduction for understanding of practical elements  
Junior Staff  
Orthopaedics  
Surgical  
Stroke unit  
Acute medical  
Community rehabilitation  
Hand therapy  
Dupuytren's disease  
Surgical correction  
Daily life difficulties  
Tendon disease  
Contract and curling fingers to the palm  
Splinting for positioning and 'healing'  
Dynamic splinting  
Scar healing  
Massaging  
Oedema management  
elevation

Emphasis on training on all elements  
 Range of movement most important for functional results  
 Practical learning  
 Example before trying  
 Ability for repetition and execution for remembering  
 Writing notes  
 Dynamical training preference  
 Written information for reference  
 Prefers questions during feedback  
 Suggested training method: practical, dynamic case study

**Axial coding/ categorisation:**

*Green: categories based on interview questions*

Theme:

----Experience----

Student  
 Junior staff  
 Experience  
 OT experience  
 Hand therapy experience  
 Dupuytren's treatment experience  
 Student  
 Placements  
 Orthopaedics  
 Student  
 Placements  
 Community OT  
 Stroke unit  
 Junior Staff  
 Community hospital  
 Orthopaedics  
 Surgical  
 Stroke unit  
 Mental health rehabilitation  
 Homeless daycentre  
 Hospice  
 Junior Staff  
 Orthopaedics  
 Mental health  
 Care of the elderly  
 Drug and alcohol abuse  
 Junior Staff  
 Orthopaedics  
 Surgical

Stroke unit  
 Acute medical  
 Community rehabilitation  
 Limited Hand therapy

Theme:

----Knowledge----

Knowledge  
 Splinting  
 Training grip strength  
 Scar healing & scar management  
 Treating range of movement  
 Treating oedema  
 Nerve healing and treatment on sensitivity  
 Emphasis during training on Dupuytren's  
 Tendon disease  
 Curling in of fingers  
 Surgery  
 Splinting  
 Splinting regime  
 Background/basic knowledge  
 Causes and effects  
 Nerve damage treatment  
 Emphasis on background theory  
 Patient education  
 Splinting  
 Range of Movement  
 Nerve damage  
 Emphasis on splinting  
 Dupuytren's disease  
 Contracture of middle and ring finger  
 Functional difficulties  
 ADL difficulties  
 Splinting  
 Training grip strength  
 putty  
 Range of movement  
 Activity based goals  
 Oedema management  
 Nerve damage (danger of)  
 Emphasis on Range of movement  
 Range of movement treatment  
 Physiotherapy  
 Emphasis on background knowledge of Dupuytren's  
 Dupuytren's disease  
 Surgical correction  
 Daily life difficulties  
 Tendon disease  
 Contract and curling fingers to the palm  
 Splinting for positioning and 'healing'  
 Dynamic splinting

Scar healing  
Massaging  
Oedema management  
elevation  
Emphasis on training on all elements  
Range of movement most important for functional results

Theme:

-----preferred learning methods-----

Learning

Preferred method of learning new information

Preference: practical or theoretical training

Methods for remembering theory

Training/education method preferred

Assessment

Feedback preference

Method of training suggestions

Writing notes

Practical instructions

Ability to revise information

Flexibility during practical training

Feedback

Face-to-face feedback

Practical training with theoretical introduction

Practical learning

Visual learning

Theoretical introduction before practical education

Direct feedback & adjustments

Practical learning

Experience

Writing notes

Recording

Cases for practice

Verbal & direct feedback

Suggestion on training: mix of theory and practice

Writing down notes for remembering

Practical training

Notes written down for own understanding

Handouts for hard-copy of facts

Presence of all knowledge in hand-out

5 minute talks

Verbal & written feedback mix, for reference and questions

Suggestion on training: theoretical

introduction for understanding of practical elements

Practical learning

Example before trying

Ability for repetition and execution for remembering

Writing notes

Dynamical training preference

Written information for reference

Prefers questions during feedback

Suggested training method: practical, dynamic case study

**Axial coding – simplified in tables for overview purposes:**

| Theme: experience                 |   |                        |
|-----------------------------------|---|------------------------|
| Occupational therapy experience   | Hand therapy experience                 | Dupuytren's experience |
| Student (2x)                      | (no real work post experience reported) | (no reports)           |
| Junior staff (3x)                 |   |                        |
| Placements (2x)                   |   |                        |
| Orthopaedics (4x)                 |   |                        |
| Community OT (3x)                 |   |                        |
| Stroke Unit (3x)                  |   |                        |
| Surgical (2x)                     |   |                        |
| Mental health rehabilitation (2x) |   |                        |
| Homeless daycentre                |   |                        |
| Hospice                           |   |                        |
| Care of the elderly               |   |                        |
| Drug and alcohol abuse            |   |                        |
| Acute medical                     |   |                        |

Table 1: Axial coding theme; Experience

| Theme: Knowledge                      |                   |                        |                 |                        |                        |                             |                             |
|---------------------------------------|-------------------|------------------------|-----------------|------------------------|------------------------|-----------------------------|-----------------------------|
| Dupuytren's                           | Splinting         | Grip strength          | Scar management | Range of movement      | Oedema                 | Sensitivity                 | Preferred training emphasis |
| Tendon disease (2x)                   | Splinting (3x)    | Training grip strength | Scar management | Range of movement (3x) | Oedema management (2x) | Nerve damage treatment (2x) | Background knowledge (3x)   |
| Curling in of fingers (2x)            | Positioning       | putty                  | massaging       | Activity based goals   | elevation              | Danger of nerve damage      | Causes and effects          |
| Correctional Surgery (2x)             | healing           |                        |                 | Physiotherapy          |                        |                             | Patient education           |
| Contracture of middle and ring finger | Dynamic splinting |                        |                 |                        |                        |                             | splinting                   |
| Functional difficulties               |                   |                        |                 |                        |                        |                             | Range of movement (2x)      |
| ADL difficulties (2x)                 |                   |                        |                 |                        |                        |                             | All elements/competencies   |
| Dupuytren's disease (3x)              |                   |                        |                 |                        |                        |                             |                             |

Table 2: Axial coding theme; Knowledge

| Theme: Learning              |  |   |  |   |
|------------------------------|--|---|--|---|
| Preferred method of learning | Methods for remembering theory                 | Preferred training method                         | Preferred feedback method                | Suggestions   |
| Practical instructions(5x)   | Writing notes (4x)                             | Flexibility during practical training (dynamical) | Face-to-face (5x)                        | Theoretical introduction with practical training after (4x) |
| Writing notes                | Hand-outs (2x)                                 | Theoretical introduction before practical         | Written after face-to-face for reference | Case-study with practical training                          |
| Visual learning (2x)         | Ability to revise information (2x)             | Case study (2x)                                   |  |   |
| Gaining experience           | recording                                      | 5 minute talks (on short topics)                  |  |   |
|                              | Presence of all factual knowledge in hand-outs | Dynamical training                                |  |   |
|                              | Ability for repetitive exercise                |   |  |   |

Table 3: Axial coding theme; Learning

### Axial coding – “Wordle diagram”



Figure 1: Staff & student coding, Wordle diagram

### **Selective coding, comparing and contrasting key themes:**

When comparing the experience of all interviewed participants, it shows that there is a versatile pool of experience. Widespread working posts show that the participants all bring along different occupational therapy experience. However none of these participants have any experience in treating in occupational hand therapy and Dupuytren's disease themselves. Some of them report seeing other practitioners performing hand therapy, from which they draw their basic knowledge.

Their knowledge of Dupuytren's disease is therefore basic and sometimes flawed, naming it a tendon disease. However they do report knowledge of the disease's causes and effects, for instance the curling in of fingers towards the palm, the functional difficulties and the difficulties it brings in daily life. Two participants also know that surgical correction is possible, and one realises that this procedure is not a cure.

When asked about separate elements of treating Dupuytren's disease, the participants know more about it. The most commonly mentioned knowledge was on splinting and range of movement. For splinting they reported that it was beneficial to the positioning and healing of the hand and also that dynamic splinting was possible for exercising. On range of movement they knew that support of physiotherapy was possible and that activity based goals could be used. Other reported knowledge was on oedema management and sensitivity treatment. Elevation was a theme connected to oedema management and sensitivity treatment was linked to the daily danger of a patient with damaged nerves. Only one participant reported knowledge of training grip strength by using putty. One participant reported knowledge of scar management through the use of massaging.

When asked about their thought on the emphasis that a Dupuytren's treatment training should be on, the majority reports that they would prefer background knowledge to have the emphasis. This way the causes and effects of the disease become clear and patient education becomes a possibility. However another often preferred emphasis is on range of movement, primarily splinting, because this is considered key to the patient's recovery.

All participants report a preference to practical instructions to learn, during which they have the ability to write notes, see examples and gain their own experience. Writing notes is reported as an efficient method to revise the theory afterwards, but a preference to have this backed-up by a hand-out containing factual knowledge is also reported. They all report a preference to face-to-face feedback which enables them to ask questions. One participant would like to receive extra written feedback for future reference.

When asked about suggestions for methods of training in Dupuytren's, almost all report a preference for a theoretical introduction with a practical training afterwards.

## Appendix 9: Implementation Interview

### ***Interview with the hand therapist for implementation:***

This interview will be about key elements that need to be addressed in the theoretical training, final products of the research and locally viable methods of practical training. The goal of this interview is to support the dissertation about Dupuytren's. The end products of the dissertation will be a protocol for Raigmore on treating Dupuytren's & means to train and assess new students and band 5 staff on treating Dupuytren's. There are no right or wrong answers, the answers you give are meant to form a requirement list for the final products to ensure implementation into local practice. Therefore the interview will be divided in three parts; final products, theoretical training & practical training

## **Final products**

What is the most important part of a protocol on Dupuytren's disease for you?

What should the end-goal of the protocol be?

What should be included in a new Dupuytren's treatment protocol for Raigmore Hospital?

- time frame?
- Treatment goals?
- Treatment steps?
- "red flags"/things patients need to reach at certain thresholds?
- Background information on treatments?

Any other suggestions for a useful protocol?

## **Theoretical training**

What is the most viable method of a local theoretical training?

Key elements required/ most important in theoretical training?

What should the end-goal of theoretical training be?

What would make you give a theoretical training to students or junior staff?

How much time should a theoretical training cost?

What do you think of a supportive hand-out after the theoretical training?

What is the most important part of a hand-out with knowledge on Dupuytren's disease, for future reference after the training?

## **Practical training**

What is the end-goal of practical training on Dupuytren's disease?

How long should practical training take?

Are materials available for exercising?

What is the most important focus during practical training according to you?

Any suggestions on a practical training that you would like to give to students or junior staff?

## **Summary:**

### **Interview 6: Implementation interview with the hand therapist:**

The hand therapist feels that the new protocol should focus on a step-by-step approach for the new staff & students to have an understanding of Dupuytren's. It's also important that they should be able to implement treatment, review it and know when to discharge patients. The end-goal is that the member of staff would be competent in treating patients post-operatively. A time-frame based protocol is a good method of sorting the treatment information, but it is also important to recognize that the patients don't all fall into these nice categories. However, it does help a beginner to get an understanding of the treatments. The protocol should not have goals, as protocols are more a quick list of what should be done and when. "Red flags" should be in the protocol, as it is important to know when patients have different outcomes than expected. Splinting should be included in a protocol, especially the style of splint required, how to make the splint and required standards. Background information should not be included in the protocol, as this should be to the point. The background information could be made separate of the protocol. As for the size of the protocol, it should be about 2 sides of A4, in order to be able to quickly overview the protocol. When asked for suggestions on the protocol, the therapist thinks time-frame based sorting is a good method, as that is in line with the way the department works.

When asked about the most viable method of local theoretical training, the therapist suggests a presentation for visual cue, so that the member of staff can observe what they need to know. Another good method is to have a talk with a patient about their hands and educate them. Theoretical training also requires some background reading of the member of staff. The most important part to learn from theoretical training is that they need to get a broad understanding of the nature of the disease, the course it can take, the OT's role and the fact that there's no cure. The hand therapist thinks that theoretical training should be included both before and after practical training. By being able to look back at the theory after practical training, the member of staff is able to relate to his own experience. Therefore a background hand-out after the practical training would be a nice method of revision for the member of staff. When asked about the commonly suggested method of training by students and junior staff members (a theoretical introduction with a practical training, supported by a hand-out for future reference), the hand therapist feels this would be a good method of training. A theoretical background hand-out should be of high quality in order to be of use. However she also feels that a time-frame based hand-out should not be too much, as it's supposed to be easy to check back on.

The practical training should work towards training the member of staff to be able to treat Dupuytren's patients independently. The most important part of the training for usefulness in practice is that it should contain standards that they could reach, a quick assessment sheet. The practical training should cover a time-frame that enables the member of staff to see multiple stages of treatment of Dupuytren's disease. Locally available exercise materials are limited, as splinting material is meant for patients. However, the members of staff are able to get a feel for the material through the use of scrap materials & can practice splinting on patients, while supervised. The suggested method of training (& assessment) is the use of the WASP method used locally (a graded process leading up to independent practice).

## ***Coding & results of the implementation interview:***

### **Open coding:**

Step-by-step approach  
Understanding of Dupuytren's treatment  
Implement treatment  
Review treatment  
Discharge patients  
Competent in independent practice  
Time-frame based sorted protocol  
Protocol is a quick overview  
"red flags" included  
Splinting included (style, fabrication & standards)  
Background information separate  
Presentation for visual cue  
observation  
patient dialogue  
patient education  
background reading  
broad understanding of the disease  
causes and effects of the disease  
occupational therapy's role  
no cure  
before and after practical training  
ability to revise  
relating to experience  
theoretical training → practical → hand-out  
high quality theoretical background  
Independent Dupuytren's treatment  
Reachable standards  
Quick assessment  
Time-frame for multiple stages  
Materials for patients  
Supervised practice  
Case-practice  
WASP method  
Graded process

## Axial coding – simplified in tables for overview purposes:

| Theme: Products                                     |   |
|---|---|
| Protocol  | Background information                      |
| Step-by-step approach                               | Understanding of Dupuytren's treatment      |
| Implement treatment                                 | Background information separate of protocol |
| Review treatment                                    |   |
| Discharge patients                                  |   |
| Competent in independent practice                   |   |
| Time-frame based sorted protocol                    |   |
| Protocol is a quick overview                        |   |
| "red flags" included                                |   |
| Splinting included (style, fabrication & standards) |   |

Table 4: Axial coding theme; Products

| Theme: Theoretical training                 |                                    |                                     |
|---|------------------------------------|-------------------------------------|
| Method                                      | Contents                           | Background information              |
| Presentation for visual cue                 | Broad understanding of the disease | Background reading                  |
| Observation                                 | Causes and effects of the disease  | Ability to revise                   |
| Patient dialogue                            | Occupational therapy's role        | Relating to experience              |
| Patient education                           | No cure                            | High quality theoretical background |
| Before and after Practical training         |                                    |                                     |
| Theoretical training → practical → hand-out |                                    |                                     |

Table 5: Axial coding theme; theoretical training

| Theme: Practical training         |                     |
|-----------------------------------|---------------------|
| Content                           | Assessment          |
| Case-practice                     | Reachable standards |
| Independent Dupuytren's treatment | WASP method         |
| Time-frame for multiple stages    | Graded process      |
| Materials for patients            |                     |
| Supervised practice               |                     |

Table 6: Axial coding theme; Practical training

## Open coding:

The implementation interview showed the preference of the local practitioner for locally viable methods of training and research products. By analysing the interview it can be made sure that resulting products can be successfully implemented into local practice.

There was a preference for a protocol to support members of staff in implementing treatment on Dupuytren's disease for independent practice. The protocol should have a step-by-step approach, sorted based on the time frames used in local treatments and easy to use as a quick overview. The protocol contents should be about the treatments, but also means to review and discharge patients. Furthermore it is requested that the protocol should contain information about splinting (style, fabrication and standards) and "red flags" to recognize patients that need to be referred back. A desire for separate background information on the protocol is also expressed. The goal of the separate background information should be to give an understanding on Dupuytren's disease occupational therapy treatment.

When asked about theoretical training, the therapist suggest a presentation for visual cues, but also observation of a treatment. Another suggestion is to allow the new member of staff to engage in a dialogue with the patient in an attempt to educate the patient about his disease. It is also mentioned that the

theoretical training should be before and after practical training. The theoretical training after could consist of a hand-out to enable the new member of staff to revise high quality background information and relate to their experience during practical training. The contents of the theoretical training should be about getting a broad understanding of the disease, its causes and effects, the occupational therapist's role and the fact that there is no cure.

The goal of practical training should be to prepare the new member of staff for independent occupational therapy practice on Dupuytren's disease. A method suggested is a supervised case-practice. Practice material is limited, as splinting material is needed for the patient, supervised case practice would solve this issue. The practical training should be spread in a time-frame that allows to see multiple stage of occupational therapy treatment on Dupuytren's disease. A desire for reachable standards is also expressed, as this would allow for a quick method of assessment. A favoured assessment method is the W.A.S.P., a locally used graded assessment model which results in the competency of independent practice.

## Appendix 10: Informed consent sheet

You are being asked to participate in a research project entitled “Instructing & assessing new staff about Dupuytren’s disease”, which is being conducted by Yorick van den Ouden, a student at Rotterdam University of Applied Sciences. This interview will be analysed and used anonymously. No one, including the researcher, will be able to associate your responses with your identity after the interview analysis. Your participation is voluntary. You may choose not to take the survey, to stop responding at any time, or to skip any questions that you do not want to answer. Your completion of the interview serves as your voluntary agreement to participate in this research project. During the interview, your response will be recorded for analysing purposes. The recording will be deleted after completion of the analysis. If you have any more questions feel free to approach the researcher at any time. You reserve the right to remove your interview responses from the research until the research deadline at the 8<sup>th</sup> of June 2015.