Multidisciplinary Consensus Guideline for Managing Trigger Finger: Results From the European HANDGUIDE Study

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Background. Trigger finger is characterized by sometimes painful snapping or locking when flexing the finger. Although trigger finger is frequently seen in clinical practice, no standard treatment protocol has been established as "best practice."

Objective. The aim of this study was to achieve consensus on a multidisciplinary treatment guideline for trigger finger.

Design. A European Delphi consensus strategy was initiated. Systematic reviews reporting on the effectiveness of surgical and nonsurgical interventions were conducted and used as an evidence-based starting point for this study.

Setting. In total, 35 experts (hand therapists and hand surgeons selected by the national member associations of their European federations and physical medicine and rehabilitation physicians) participated in the Delphi consensus strategy.

Measurements. Each Delphi round consisted of a questionnaire, an analysis, and a feedback report.

Results. After 4 Delphi rounds, consensus was achieved on the description, symptoms, and diagnosis of trigger finger. The experts agreed that use of orthoses (splinting), corticosteroid injections, corticosteroid injections plus use of orthoses, and surgery are suitable treatment options. Relevant details for the use of orthoses, corticosteroid injections, and surgery were described. Main factors for selecting one of these treatment options were identified as severity and duration of the disease and previous treatments received. A relationship between the severity and duration of the disorder and the choice of therapy was indicated by the experts and reported on in the guideline.

Limitations. The results represent a group's opinion at a given point in time. When the evidence for the effectiveness of interventions increases, experts' opinions will change, and the guideline should be re-evaluated and adjusted in view of these new insights.

Conclusions. This multidisciplinary treatment guideline may help involved therapists and physicians in the treatment of trigger finger and indicate areas needing additional research.

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The participating organizations and members of the European HANDGUIDE Group are presented on page 1428.

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Locking and sometimes painful snapping are characteristics of trigger finger (stenosing tenosynovitis). In less severe cases, patients have pain in the affected finger, stiffness (especially in the morning), and tenderness over the A1 pulley without triggering. Several causes have been proposed, but the precise etiology remains unclear.[1] Although trigger finger is one of the most common conditions seen in a hand surgeon's office, no standard treatment protocol has been established as "best practice."[2] Different treatment strategies can be followed, from use of orthoses (splinting) or corticosteroid injections to percutaneous or open surgery.[3] Developing evidence-based multidisciplinary treatment protocols and guidelines can help to optimize the care for hand disorders[4] and guide health care professionals to provide the patient with trigger finger with the most effective and efficient treatment available. This study was part of the European HANDGUIDE study, a project with the goal to develop treatment guidelines for the following 5 nontraumatic hand disorders: trigger finger, de Quervain disease, Dupuytren disease, carpal tunnel syndrome, and Guyon canal syndrome. This article concentrates on trigger finger.

To establish an evidence-based starting point, a systematic review was published on the evidence for the effectiveness of nonsurgical, surgical, and postsurgical interventions for trigger finger.[4] Subsequently, in the absence of sufficient evidence-based information, a Delphi consensus strategy was performed to achieve consensus on a treatment guideline for trigger finger. In a Delphi consensus strategy, a series of sequential questionnaires (or rounds) is presented to a panel of experts, interspersed with controlled feedback, with the aim to achieve consensus of opinions among these experts.[5] This is a proven method when insufficient conclusive evidence is found in the literature and additional expert opinion is needed to achieve consensus.[6–8] In this article, the results of the Delphi consensus strategy are reported.

Method

Preparation of the Study—Systematic Review

Evidence for effectiveness of interventions for trigger finger. To provide an evidence-based overview of nonsurgical and surgical interventions for trigger finger, we searched the Cochrane Library, PEDro, PubMed, EMBASE, and CINAHL up to February 2009 to select potential relevant studies from the titles and abstracts of the references retrieved by the literature search. Relevant Cochrane reviews and randomized controlled trials (RCTs) were included. Two reviewers independently extracted the data and performed a methodological quality assessment. Because of heterogeneity of the data, a meta-analysis was not possible; therefore, a best-evidence synthesis was performed to summarize the results of the included trials (Appendix 1). One Cochrane review and 13 RCTs were included, reporting on steroid injections and surgery. No studies reporting on physical therapy could be included. Table 1 shows a summary of the evidence for treatment of trigger finger. A more detailed description of the method and the results is available in the article by Huisstede et al.[4] The results were used as an evidence-based starting point for the Delphi consensus strategy.

Delphi Consensus Strategy

Steering committee, advisory team, and selection of experts. A steering committee comprising a hand surgeon, a physical medicine and rehabilitation (PM&R) physician, and a physical therapist was composed to initiate and guide the study.

Table 1.
Evidence for the Effectiveness of Interventions for Trigger Finger

Interventions	Evidence[a]
Nonsurgical	
Physical therapy	No data
Oral medication	No data
Injection	Moderate or strong evidence[b]
Other[c]	No data
Surgical	0[d]
Postsurgical[e]	No data

[a] Searches in PubMed, EMBASE, CINAHL, and PEDro up to February 2009.
[b] Moderate evidence for effectiveness in favor of steroid injection plus lidocaine versus lidocaine injection in the short term (about 4 weeks) and for effectiveness in favor of corticosteroid injection versus placebo in the short term (1 week).
[c] Other than physical therapy, oral medication, or treatment with an injection.
[d] Randomized controlled trials were available, but only limited, conflicting, or no evidence was found for the effectiveness of the interventions.
[e] Treatment after surgery.

All 3 Steering Committee members have PhD degrees as well as a clinical and a scientific or epidemiological background. They designed the questionnaires, analyzed the responses, and formulated the feedback reports. Furthermore, an advisory team (consisting of 2 professors of hand surgery, 1 professor of PM&R, and an internationally renowned hand therapist) was formed, which could be consulted at any time and could give their opinions and advice as they saw fit.

The Federation of European Societies for Surgery of the Hand (FESSH) and the European Federation of Societies for Hand Therapy (EFSHT) supported this study. The national member associations of these organisations selected the experts in their respective fields. Each national member association was invited to select a maximum of 3 representative experts for this Delphi consensus strategy. In addition, some European PM&R physicians who specialized in hand rehabilitation were invited to

participate in this study. All participating experts fulfilled all of the criteria listed in Table 2.

Procedure. Each round of the Delphi consensus strategy consisted of a questionnaire and a feedback report. In the feedback report, the results of the previous questionnaire or round were reported. The questionnaires of the Delphi rounds on trigger finger included questions on the description, symptoms, diagnosis, grading systems, and interventions for this disorder. In this Delphi consensus strategy, only the hand surgeons and PM&R physicians answered questions on treatments with medication and injections, and only the hand surgeons answered questions on surgical treatments. All experts answered remaining questions, including questions on advice after treatment with corticosteroid injections and postsurgical treatment.

We used structured questions with answer formats such as "yes/no/no opinion," after which the experts were invited to explain their individual choices. After each round, a feedback report was made to inform the experts about the answers and explanations of all experts, and on which items consensus was achieved. Based on the answers and arguments of the experts, the Steering Committee formulated the questions for the following questionnaire. Finally, conclusions were presented and explained in the feedback report.

To avoid any imprecise definition for consensus, the experts were consulted about the cutoff point for consensus.[8] A cutoff point of 70% was proposed in the first round of the Delphi consensus strategy because this cutoff is often used in Delphi strategies.[9,10] In case of consensus, this percentage also was calculated for each of the 3 participating professional groups. To reveal any discordant viewpoints among these groups, a remark was made in the feedback report when fewer than 50% of the experts within a professional group answered in accordance with the achieved consensus.

Table 2.
Experts' Criteria for Participation in the Delphi Consensus Strategy

Criterion No.	Description
1	The expert[a] should be a medical or health care professional with considerable experience in treating patients with nontraumatic tendinopathies of hand disorders
2	The expert should be considered by his or her own professional specialty to be a key person in the field of nontraumatic hand disorders
3	The expert should have basic knowledge of evidence-based practice

[a] Participating hand surgeons and hand therapists participated as delegates for their respective professional association.

Target population. All physicians and health care professionals who are involved in the treatment of patients with a trigger finger can use this guideline.

Delphi Questionnaires

Description, symptoms, and diagnosis of trigger finger. In the first round questionnaire, we included short descriptions of trigger finger, the *International Statistical Classification of Diseases and Related Health Problems, 10th Revision*[11] (ICD-10) code, the symptoms, and its diagnostic process and asked the experts if they agreed with these descriptions. Furthermore, the grading systems of Patel and Moradia[12] and Peter et al[13] are often used to stage the severity of trigger finger. In the first round questionnaire, these 2 systems were incorporated into questions about the use of grading systems in clinical practice to classify the severity of trigger finger. We also asked if all health care professionals should use a grading system and, if so, which grading system was preferable. The questions of the subsequent rounds were formulated based on the results of the respective previous rounds.

Interventions to treat trigger finger. In the first round questionnaire, generally accepted nonsurgical interventions (ie, use of orthoses and corticosteroid injection) and surgical interventions (ie, open or percutaneous division of the A1 pulley) for trigger finger were listed. The evidence for the effectiveness of each type of intervention, including the full text of the review[4] and the "evidence table" as reported in this review, was incorporated into this questionnaire.

The above-mentioned interventions were then discussed. For each intervention, questions were included about its usefulness and the main factors for starting and discontinuing the intervention. To identify useful treatments, combinations of treatments, and a therapeutic hierarchy of interventions, the experts were asked if the interventions could be used as sole treatment or combined with another treatment, whether a specific intervention is the first choice in treatment, and to identify the treatment strategy in case the intervention was insufficient. Additional questions were included on the use of orthoses, corticosteroid injections, and surgery. In all situations where treatment options were suggested by the Steering Committee, the experts were invited to provide additional options to avoid any limitations in the experts' choices.

Table 3.
Experts and Participating Countries in the HANDGUIDE Study[a]

Profession (European Federation)	Participating Countries (In Alphabetic Order)	Total No. of Experts	No. of Experts for Trigger Finger and Years of Experience $\bar{X}$ (Range)
Hand surgeons (FESSH)	Belgium, Denmark, Estonia, Finland, France, Germany, Italy, Norway, the Netherlands, Spain, Sweden, Switzerland, Turkey, and United Kingdom	52	14 15.2 (8–30)
Hand therapists (EFSHT)	Belgium, Denmark, Finland, France, Italy, Norway, the Netherlands, Slovenia, Sweden, Switzerland, Turkey, and United Kingdom	47	16 17.5 (6–33)
PM&R physicians	Austria, the Netherlands, Portugal, Slovenia, Switzerland, and Turkey	13	5 16.0 (10–20)
Total		112	35 16.5 (6–33)

[a] FESSH=Federation of European Societies for Surgery of the Hand, EFSHT=European Federation of Societies for Hand Therapy, PM&R=physical medicine and rehabilitation.

In the second round questionnaire, the treatment options (and their combinations) mentioned by the experts were summarized, and the experts were asked to state (separately for each treatment option/combination of treatment options) whether this treatment option is applicable to treat trigger finger. Based on the answers given by the experts in the first round on the question about what should be done in case one of above-mentioned treatment was not successful, a therapeutic hierarchy was formulated (ie, from the lightest—in the context of this article, the term "lightest" contains elements of invasiveness as well as effectiveness—to the most intense form of treatment). Subsequently, the experts were asked ("yes/no/no opinion") if they agreed with this therapeutic hierarchy. The experts also were asked what they considered to be the main factors for choosing a certain treatment option and in which ways these factors influenced their choice of treatment. For questions relevant for each specific intervention for which no consensus was achieved in the first round, new questions were added in the second round.

In the third round, the summary of the consensus on the main factors for choosing a treatment option for trigger finger were combined and presented in one table.

Any remaining questions on this table and all other items, for which no consensus was achieved in the second or third round, were added in the third and fourth rounds, respectively.

Data Analysis

A quantitative and qualitative analysis was made of the responses from the Delphi rounds. Quantitatively, for each question we determined and reported the number and percentages of experts who gave a certain answer. Subsequently, the levels of conformity were calculated to decide whether consensus was achieved. In the qualitative analysis, key elements were extracted from the rationale for the answers as well as additional information given by each expert. When consensus was reached on a subject, these elements could be used to compose new questions on related subjects. When no consensus could be reached on a subject, the elements could be used to rephrase the original question or to compose new questions on related subjects.

Role of the Funding Source

The study was funded by Fonds NutsOhra, the Netherlands.

Results

Expert Panel

A total of 112 experts (52 hand surgeons, 47 hand therapists, and 13 PM&R physicians) from 17 European countries were selected to participate in 1 of the 3 Delphi consensus strategies of the HANDGUIDE study, which was performed between June 2009 and December 2012. For the Delphi consensus strategy on trigger finger, 38 experts (16 hand surgeons, 16 hand therapists, and 6 PM&R physicians) were selected. Three of the selected experts (2 hand surgeons and 1 PM&R physician) did not complete any of the questionnaires. Response rates for the first, second, third, and fourth round questionnaires of the remaining 35 experts were 97%, 94%, 91%, and 91%, respectively. Table 3 lists the participating countries, the total number of experts of the HANDGUIDE study, and the number of participating experts in the Delphi consensus strategy on trigger finger and

their years of experience with this topic.

Delphi Consensus Strategy on Trigger Finger

Cutoff point for consensus. In the first round, consensus was achieved on a cutoff point of 70% for consensus. In this Delphi consensus strategy, there was only one discordant viewpoint between a professional group and the general consensus; <50% (2 of the 5) of the PM&R physicians agreed to add a local anesthetic to treatment with a corticosteroid injection.

Guideline for trigger finger. Four rounds were needed before consensus on the treatment guideline for trigger finger could be achieved. The guideline is shown in Appendix 2.

Description, Symptoms, and Diagnosis of Trigger Finger

In the first round, consensus was achieved on a short description of a trigger finger, its ICD-10 (2006) code, its symptoms, and the diagnosis of the disorder. Nevertheless, some experts noted that the definition of the disorder could be used only for adults and not for children (ie, congenital). Therefore, it was suggested to add the word "acquired" to this description. However, because in subsequent rounds no consensus was achieved on this change, the use of the word "acquired" was omitted.

Grading the Severity of Trigger Finger

In the first round of the Delphi consensus strategy, the experts indicated that different classification systems for trigger finger are used in clinical practice. Besides the above-mentioned grading systems of Patel and Moradia[11] and Peter et al,[12] in the first round the experts mentioned the Quinnell grading[13] and the Newport classification.[14] Nevertheless, almost 70% of the experts stated that they do not use a grading system themselves. They make their own assessment of the severity of trigger finger on the basis of the clinical picture and felt using a grading system had no additional value for this assessment. Despite this finding, about 50% of the experts indicated that a grading system should be used, which means that almost 20% of these experts prefer to use a classification but do not use it. In general, it was indicated that it is important that studies compare the outcomes; on the other hand, it also is important to achieve uniformity in clinical practice. Moreover, in the first round of the Delphi consensus strategy, it was indicated that the severity of trigger finger should be documented. Regarding which grading system should be used, 22.2% and 33.3% of the experts prefer to use the grading system of Patel and Moradia[11] and Peter et al,[12] respectively; the remaining experts had no opinion on this subject. Therefore, this question had no equivocal answer. Adding 2 more grading systems (ie, those of Quinnell[13] and Newport et al[14]) would only increase the amount of disagreement on this topic.

When experts were asked if they had additional remarks on the use of a grading system for trigger finger, the most important was that (besides locking and triggering, as mentioned in all the above-mentioned grading systems) the factor "pain" should be added to the grading system. Based on the answers given by the experts after the first round of this Delphi consensus strategy, it was concluded that we would not achieve consensus on a single grading system to be used in clinical practice. However, it was indicated that, besides locking and triggering, pain is an important factor to assess the severity of trigger finger. This topic was subsequently discussed in the second to fourth rounds of the Delphi consensus strategy, in anticipation of the answers on other questions regarding components of importance in relation to the choice of treatment strategy.

Table 4.
Therapeutic Hierarchy of Suitable Treatments for Trigger Finger[a]

Treatment No.	Treatment
1	Use of orthoses
2	Corticosteroid injections
3	Corticosteroid injections plus use of orthoses
4	Operative treatment/surgery

[a] A therapeutic hierarchy—from the lightest to the most serious form of treatment—does not mean that all steps should always be performed for each patient.

Interventions to Treat Trigger Finger

Treatment options and therapeutic hierarchy. Experts did not add any interventions that should be included as "most commonly used interventions" to the list of nonsurgical and surgical interventions (as described in the "Method" section). Consensus was achieved that use of orthoses, corticosteroid injections, corticosteroid injections plus use of orthoses, and surgery are applicable in the treatment of trigger finger. Use of orthoses was considered the lightest form of treatment, followed by corticosteroids and, finally, surgery for the most serious forms of trigger finger. Consensus was achieved on a therapeutic treatment hierarchy (Tab. 4).

Additional questions for use of orthoses, corticosteroid injections, and surgery. For use of orthoses, corticosteroid injections, and surgery, consensus was achieved on the aim of the treatment and when that treatment should be adjusted or stopped. Other items for each specific treatment are discussed below.

Table 5.
Kinds of Orthoses Used in Clinical Practice for Trigger Finger and Presented in the First Round Questionnaire[a]

Orthosis	Description
1	0° MCP blocking orthosis to prevent the tendon from loading the A1 pulley
2	10°–15° (hyperextension) MCP blocking orthosis; this orthosis blocks the MCP joint in extension to prevent the finger from flexing and thereby prevents the tendon from loading the A1 pulley

[a] MCP=metacarpophalangeal.

Use of orthoses. In the first round questionnaire, 2 kinds of orthoses (splints) often used in clinical practice were considered (Tab. 5). The experts preferred to use a metacarpophalangeal (MCP) blocking orthosis in 0 degrees. No additional orthoses were considered to be adequate. The orthosis should be worn for 3 to 6 weeks. Of all suggested orthotic regimens (splinting regimens) (ie, only during daytime, only during nighttime, 24 hours per day, or depending on the trigger pattern of the patient), there was a slight preference for the latter regimen. However, no consensus was achieved on this issue, and this topic could not be included in the guideline.

Corticosteroid injection. All experts indicated that an intermediate-acting corticosteroid should be used to treat trigger finger. Consensus also was achieved on the maximum number of injections (ie, 1–3) that a local anesthetic should be used with the corticosteroid injection and on what advice the patient should receive after this treatment.

Surgery. Consensus was achieved that open surgery (in preference to a percutaneous technique) with use of a local anesthesia technique, a transversal incision, and use of nonresorbable sutures is preferable for trigger finger. Recommendations for treatment of the primary postoperative period (ie, up to 10–14 days postsurgery) are included in the guideline. Consensus was achieved on the main goal of postsurgical treatment after this period.

Other therapeutic interventions. Besides use of orthoses, corticosteroid injections, and surgery (or a combination thereof), the experts also mentioned nonsteroidal anti-inflammatory drugs (NSAIDs) and cold therapy. To indicate that the guideline concentrates on the most commonly used interventions but that additional therapeutic modalities can be added, consensus was achieved to include the following note in the guideline: "Depending on the patient's situation and personal preferences, additional therapeutic modalities, such as NSAIDs and cold therapy, can be added."

Main factors for indications of the use of a treatment option. In the first Delphi round, experts' answers suggested that the main factors for choosing a treatment option are: (1) severity of the disease, (2) duration of the disease, and (3) previous treatments given. The latter item also was incorporated in the therapeutic hierarchy. The relationship between severity or duration of the disease and the choice of therapy was further explored in the subsequent Delphi rounds. On the basis of the terminology used by the experts for severity and duration, 5 levels were created for both variables. In the first Delphi round, the experts described the severity of trigger finger in terms of the amount of pain or severity of symptoms (eg, mild, severe) of pain and snapping or locking. The duration of trigger finger was expressed in terms of acute, subacute, and chronic or by mentioning the exact duration in terms of number of weeks or months. Combining these expressions for severity and duration resulted in the identification of 5 subgroups for both severity and duration (Tab. 6).

In the second round, the experts were asked which treatment options, as listed in Table 4, were suitable for the different subgroups of severity of symptoms. Subsequently, for each level of severity,

Table 6.
Subgroups Related to the Severity and Duration of Trigger Finger

5 Subgroups for Severity		5 Subgroups for Duration
Symptoms	**Pain**	**Duration (Stage)**
1: very mild	Very mild pain/no snapping or locking	1: ≤1 mo (acute)
2: mild		2: 1≤2 mo (subacute)
3: moderate	↓	3: 2≥3 mo
4: severe		4: 3≤6 mo (chronic)
5: very severe	Unbearable pain/cannot be unlocked	5: ≥6 mo (chronic)

the Steering Committee calculated for which treatment or combination of treatments the cutoff point of 70% for consensus was reached or exceeded. The same process took place for the duration of the complaints.

The results for severity and duration were combined and reported in a table that was included in the final guideline. In this table, each cell represents a subgroup of patients with a certain severity and duration of trigger finger and the corresponding treatment options. After the second Delphi round, some cells in this table remained empty. After the fourth Delphi round, all cells included one or more treatment options (see the table in the guideline presented in Appendix 2).

Discussion

The aim of this European Delphi consensus strategy was to decide on a treatment guideline for trigger finger that can be used by all relevant medical and paramedical specialties involved in its treatment. After 4 Delphi rounds, multidisciplinary consensus was achieved on the majority of the items relevant to the subject. This is the first time that a multidisciplinary treatment guideline for trigger finger has been developed on a European level.

To differentiate between an acquired trigger finger and a congenital trigger finger, some experts suggested adding the word "acquired" to the description of trigger finger; however, no consensus was achieved on this topic. Initially, the congenital trigger finger was seen and treated as being different from the adult acquired trigger finger.[15,16] However, due to recent debate on the existence of a true congenital form of trigger finger, treatment is starting to resemble that of the acquired form.[17–19]

For use of orthoses, no evidence for effectiveness was found in our systematic review.[4] One recent RCT compared 2 different orthoses: the MCP joint blocking orthosis and the distal interphalangeal (DIP) joint blocking orthosis.[20] At the 6-week follow-up, the MCP joint blocking orthosis resulted in complete relief of symptoms in 31% of the patients compared with 27% of those treated with the DIP joint blocking orthosis, whereas partial relief was achieved in 46% and 20%, respectively. In that study, about 75% of the patients wore the orthosis for more than 18 hours per day, and about 25% wore the orthosis for less than 12 hours per day. The MCP joint blocking orthosis was found to be more comfortable than the DIP joint blocking orthosis.

The experts in our study achieved consensus that the MCP blocking orthosis in 0 degrees is preferable. Neither incorporation of the wrist into the orthosis nor the wrist angle were mentioned by the experts, probably because when the MCP joint is in the neutral position (or slight hyperextension), the tension in the involved flexor tendon is not transferred to the A1 pulley. Therefore, the wrist angle and flexor tendon tension are not relevant for use of orthoses in trigger finger.

No consensus could be achieved on the optimal orthotic regimen. The fact that no consensus could be reached on the duration of wearing the orthosis during the day does not mean that the efficacy of use of orthoses is independent of how much the orthosis is used. It is the result of the democratic nature of a Delphi consensus strategy combined with the varied experience of the experts that wearing an orthosis has advantages as well as disadvantages. The experts differed sufficiently in their opinions about the optimal balance between these 2 opposing qualities of use of orthoses to prevent consensus from being reached. Future research should concentrate on the effectiveness and optimal use of orthoses for trigger finger.

Evidence for the effectiveness of corticosteroid injections or surgery to treat trigger finger is scarce.[4,21] Only a small number of RCTs concentrating on treatment with corticosteroid injections or surgery were found. Corticosteroid injections were found to be effective (moderate evidence) for the first 1 to 4 weeks but did not remain effective in the mid term or long term. Similar findings were found for the effectiveness of corticosteroid injection for specific upper extremity disorders.[22–24] The mechanism behind the reduction of symptoms when using corticosteroid injections remains unclear. To emphasize that the effect of this treatment is not anti-inflammatory, the experts decided to add a note clarifying this fact when describing the aim of this treatment in the guideline.

Consensus was achieved on the maximum number of corticosteroid injections (ie, 1–3) that can be used in the treatment of trigger finger. Accidentally, the time interval between these injections was not discussed in this Delphi consensus strategy. However, in future updates of the guideline, this time interval definitely should be included in the Delphi consensus strategy.

In the systematic review that was performed before the Delphi consensus strategy and used as a basis for this study, conflicting evidence regarding surgery was found for the effectiveness of an open versus a percutaneous technique.[4] However, the experts participating in this study achieved consensus that an open surgical technique is preferable; it is considered the safest technique

because it allows more careful inspection of the surgical area.

Some recent RCTs studied treatment with surgery versus corticosteroid injections and were published after we conducted the systematic review that was used as a starting point for the Delphi consensus strategy. In a recent RCT,[25] percutaneous A1 pulley release was compared with one steroid injection for trigger finger. At the 6-month follow-up, there were significantly more recurrences after corticosteroid injection than after surgery. Furthermore, differences in pain in favor of surgery and in grip strength in favor of corticosteroid injections were found. Because the researchers of this RCT considered recurrences as their main outcome measure, they concluded that surgery (although more costly) is more effective than treatment with one corticosteroid injection for trigger finger.

Another recent RCT[26] reported on the effectiveness of corticosteroid injections versus percutaneous release versus open surgery. At the 6-month follow-up, of those patients treated with 1 and 2 corticosteroid injections, 57% and 86%, respectively, were cured from triggering compared with 100% in both surgery groups. For pain and movement of the fingers, no significant differences were found between the groups. In a recent small-scale RCT,[27] ultrasound-guided corticosteroid injection was compared with open surgery; although the differences are not significant, at the 6-month follow-up those patients treated with corticosteroid injections had a shorter recovery time than those treated with surgery (which has an impact on reduced absence from work and other activities).

As shown in the above-mentioned studies, depending on the primary outcome measurement used, conclusions can differ regarding the effectiveness of surgery versus corticosteroid injections. Kerrigan and Stanwix[2] performed a cost-minimization analysis to identify the least costly strategy for successful treatment of trigger finger. Five different corticosteroid injections or surgical treatment regimens were studied: 1, 2, or 3 corticosteroid injections before open surgery; open surgical release as first option; and percutaneous release with definitive open surgery for failures.[2] They found that the costs were lowest in case the treatment strategy concerns a corticosteroid injection, followed by a second injection for failures or recurrence, followed by definitive surgery if needed. Moreover, the costs were 248% to 340% lower when open surgery was performed as first option. In our opinion, more RCTs are needed (taking into account the number of corticosteroid injections needed for successful treatment and using different outcome measurements) before firm conclusions can be drawn regarding the evidence for treatment and cost-effectiveness of corticosteroid injections compared with surgery.

The guideline was developed in cooperation with many experts in the field of hand disorders, with different clinical backgrounds and from different countries. By providing feedback from previous Delphi rounds, the Delphi consensus strategy has the advantage of a group process of building on the work and expertise of all participating experts.[28] Furthermore, only guidelines developed in international collaboration have a reasonable chance of becoming widely used. Moreover, standardization is one of the best methods to improve quality and reduce costs of care.[29]

An important limitation of a Delphi consensus strategy is that bias might be introduced due to individual interpretation of the findings. Therefore, objectivity of the researchers is most important when performing a Delphi consensus strategy. In the present study, the Steering Committee tried to avoid this kind of bias by adding notes in the feedback report, including summaries of the explanations given by the experts and interpretation of these summaries. Subsequently, the experts were asked if they agreed with this and if they had other concerns or considerations that should be taken into account. Another limitation of a Delphi consensus strategy is its temporariness. The results of a Delphi consensus strategy generally represent a group's opinion at a given point in time.[30] When the evidence for the effectiveness of interventions increases or new treatment options are developed, experts' opinions will change. Consequently, the guideline should be re-evaluated and adjusted in view of these new insights.

In conclusion, by means of a European Delphi consensus strategy, hand therapists, hand surgeons, and PM&R physicians achieved multidisciplinary consensus on a treatment guideline for trigger finger. This guideline can be of use for physical therapists, occupational therapists, and hand therapists as well as physicians involved in the treatment of patients with a trigger finger. The guideline also may help in targeting future research on trigger finger.

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* Only experts who filled in at least 2 questionnaires are mentioned.

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Appendix 1.

Levels of Evidence for Effectiveness Used in the Systematic Review

1. Strong evidence for effectiveness: consistent (when ≥75% of the trials report the same findings) positive (significant) findings within multiple higher-quality randomized controlled trials (RCTs)

2. Moderate evidence for effectiveness: consistent positive (significant) findings within multiple lower-quality RCTs or 1 high-quality RCT, or both

3. Limited evidence for effectiveness: positive (significant) findings within 1 low-quality RCT

4. Conflicting evidence for effectiveness: provided by conflicting (significant) findings in the RCTs (<75% of the studies reported consistent findings)

5. No evidence found for effectiveness of the inventions: RCTs available, but no (significant) differences between intervention and control groups were reported

6. No systematic review or RCT found

Appendix 2.
Guideline for Trigger Finger

The European HANDGUIDE study

The aim of the European HANDGUIDE study was to achieve consensus on multidisciplinary treatment guidelines for the following five non-traumatic hand disorders: trigger finger, De Quervain's disease, Dupuytren's disease, carpal tunnel syndrome, and Guyon's canal syndrome.

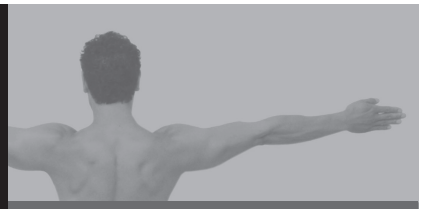
To establish an evidence-based starting point for the HANDGUIDE study, systematic reviews were written reporting on the evidence for effectiveness of non-surgical, surgical as well as post-surgical interventions for these five hand disorders.
Supplementary to the available evidence-based information, a Delphi consensus strategy was used to achieve consensus on each treatment guideline. In a Delphi consensus strategy a series of sequential questionnaires or rounds is presented to a panel of experts, interspersed by controlled feedback, with the aim to achieve consensus of opinions within this group of experts.
A total of 112 experts – hand surgeons, hand therapists, and PM&R physicians – from 17 countries were selected by their national member associations of the Federation of European Societies for Surgery of the Hand (FESSH) and the European Federation of Societies for Hand Therapy (EFSHT) to participate in the HANDGUIDE study. Also, a number of Physical Medicine and Rehabilitation (PM&R) physicians specialized in hand rehabilitation were added to the expert group. The HANDGUIDE study was performed between June 2009 and December 2012.

Treatment guideline for trigger finger

This guideline concerns the treatment of trigger finger. A total of 35 experts (14 hand surgeons, 16 hand therapists and 5 PM&R physicians) cooperated in the Delphi consensus strategy to achieve consensus on this treatment guideline.

For whom?

All physicians and allied healthcare professionals who are involved in the treatment of patients with trigger finger can use this guideline.



MULTIDISCIPLINARY TREATMENT

Initiative and organisation:
This guideline is part of the HANDGUIDE study, which was initiated and organised by (Blinded).
This study is supported by the FESSH and the EFSHT.

Project group:
(Blinded)

GUIDELINE FOR TRIGGER FINGER

Description of trigger finger
Trigger finger is a disorder characterized by snapping or locking of a finger or thumb with or without pain, generally occurring in the palm at the level of the metacarpophalangeal (MP) joint. In most cases this is due to a non-inflammatory thickening of the digit's A1 pulley with secondary entrapment and sometimes thickening of the tendon(s).

ICD-10 (2010)

Soft tissue disorders (M60-M79)
- Disorders of synovium and tendon (M65-M68)
  - M65 Synovitis and tenosynovitis,
    - M65.3 Trigger finger (Nodular tendinous disease)

Symptoms of patients
When attempting to extend the digit after full flexion, there is a sensation of snapping or actual locking. This snapping or locking is frequently associated with pain.

Diagnosis
History:
The initial diagnosis of trigger finger is usually made on the basis of clinical symptoms, as described above.

Physical examination:
Palpation of the region of the A1 pulley can reveal tenderness or swelling. When the tendon is moved, some grinding, unevenness or swelling of the tendon can be felt and triggering can be provoked.

Appendix 2.
Continued

I NON-SURGICAL TREATMENT

1 Splinting

Aim of splinting: To decrease the amount of mechanical friction of the tendon within the tendon sheath by immobilization of the affected finger and consequently avoiding movement between the aforementioned structures in order to decrease the amount of triggering and other symptoms.

Type of splint: A MCP blocking splint in 0 degrees.

Duration of wearing the splint: 3 to 6 weeks.

When should a splint be adjusted or stopped? If the patient is free of symptoms or splinting has insufficient or no effect after a certain period of splinting, or when complications, such as skin problems, occur.

2 Corticosteroid injection

Aim of a corticosteroid injection: To reduce the symptoms of trigger finger. The mechanism behind this reduction still needs to be elucidated.[1]

Kind of corticosteroid injection: Intermediate-acting corticosteroid injections, such as methylprednisolone or triamcinolone, should be used. **I**t is preferable to add a local anaesthetic to a corticosteroid injection to treat trigger finger.

Maximum number of injections: 1-3.

Advice after treatment with corticosteroid injections should focus on 2 items:
1 Possible adverse effects of the corticosteroid injection:
   – Pain: The patient can have pain for 1 or 2 days. **I**f the pain persists for a longer period, a physician should be contacted.
2 Aftercare
   – Resting the hand: Partial or complete rest for 0-7 days depending on the clinical situation of the patient.

When should treatment with corticosteroid injections be stopped? If the patient is free of symptoms, if the maximum number of steroid injections (1-3) has been given, and in case of complications such as allergy, increased pain or nerve injury.

II SURGICAL TREATMENT

Surgical division of the A1 pulley

Aim of surgery: To reduce the mechanical friction of the tendon within the A1 pulley due to surgical division or partial resection of the A1 pulley in order to reduce the symptoms of trigger finger.

Preferable technique:
– Anaesthetic technique: Local anaesthesia,
– **I**ncision: Transverse incision,
– Open surgery,
– Suture: Non-resorbable.

What to do if surgery is not successful?
If division of the A1 pulley does not resolve trigger finger, the patient can be re-examined to check for other diagnosis such as tenosynovitis or A2 pulley problems. **I**f the diagnosis is correct, operation can be repeated or conservative treatment, such as hand therapy, NSA**I**Ds or corticosteroid injections, can be initiated.

Post-surgical treatment

Primary post-operative advice: During this primary post-operative period, i.e. up to 10-14 days after surgery, when the sutures are removed, advice for the patient consists of:
1 Elevation of the hand, i.e. hand above heart level to prevent swelling,
2 Move the finger to prevent scar adhesions,
3 No heavy lifting or forceful activities until 2-4 weeks post-surgery,
4 Hand therapy, bandaging, or cold therapy if necessary.

Post-surgical treatment can be prescribed if necessary.

Main goal of post-surgical therapy: Is (if necessary) to return the patient to full function by increasing range of motion, and preventing oedema and scar adhesions. **I**n addition, instructions should be given to the patient on how to best use the hand.

Treatment options and combinations for trigger finger

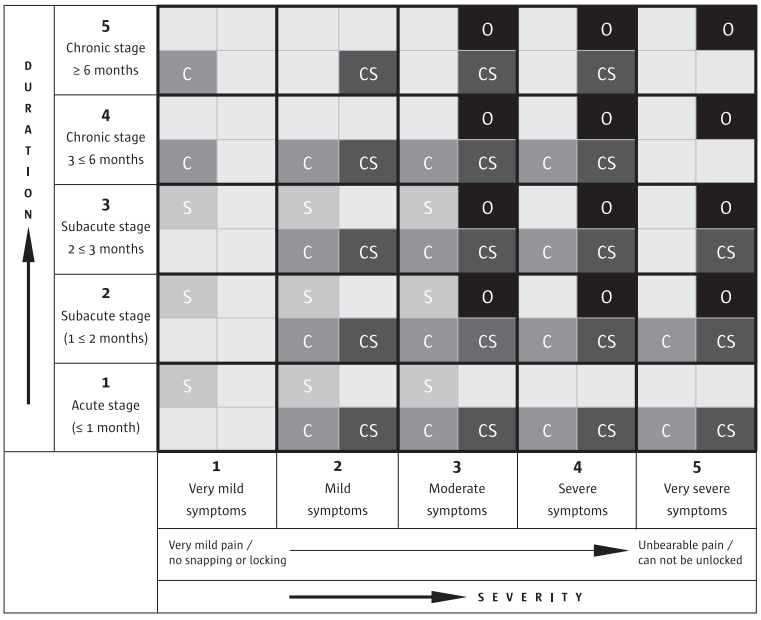
The following treatment options are applicable in the treatment of trigger finger:	**Therapeutic hierarchy** [2, 3, 4]
– Splinting (S),	1 S
– Corticosteroid injection (C),	2 C
– Corticosteroid injection plus splinting (CS),	3 CS
– Operative treatment/surgery (O).	4 O

[1] Originally, the aim of corticosteroid use was to decrease the amount of inflammation. However, because tissue changes in hand and wrist, including trigger finger, appear to be more degenerative than inflammatory in nature, the exact mode of action of corticosteroids remains unclear, although some hypotheses do exist.

[2] Namely, from the lightest to the most severe form of treatment options.
[3] Please note that a therapeutic hierarchy does not indicate that all steps should be performed for each patient.
[4] Depending on the patient's situation and personal preferences, additional therapeutic modalities, such as NSA**I**Ds and cold therapy, can be added.

Appendix 2.
Continued

Table Severity and duration of trigger finger and suitable treatment options
Severity and duration of trigger finger are the main factors when deciding on the type of treatment. Both severity and duration were divided into five subgroups. For each subgroup of patients the suitable treatment options are indicated below:



S: splinting; **C**: corticosteroid injection; **CS**: corticosteroid injection plus splinting; **O**: operative treatment/surgery.

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