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Rehabilitation of wrist injuries

Submission date
04/02/2026

Recruitment status
Recruiting

Registration date
24/04/2026

Overall study status
Ongoing

Last Edited
24/04/2026

Condition category
Injury, Occupational Diseases, Poisoning

[_] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[X] Record updated in last year

Plain English summary of protocol

Background and study aims
The wrist is one of the body's most complex and unique joint systems that enables us to grasp, hold and manipulate objects with both precision and force. Trauma to the wrist can result in pain and disability. Even though post-traumatic wrist pain often carries a high morbidity and is difficult to treat, no treatment consensus exists. The literature and research on wrist rehabilitation are predominantly theoretical in nature, with limited clinical evaluations.
The aim of this study is to describe the development and to evaluate the feasibility of PROWRIST, a 12-week progressive rehabilitation program for individuals with post-traumatic wrist pain. The program consists of a progressive exercise program combined with structured patient education. The PROWRIST program aims to improve wrist function, reduce pain, and enhance activity performance through gradually increasing load, difficulty, and movement complexity, with a strong focus on effective transfer to daily activities.
The PROWRIST program will be developed through a co-creative process that integrates insights from clinical experts and is to be evaluated on end-users (individuals with posttraumatic wrist pain). Its structure and content will be designed in accordance with the Template for Intervention Description and Replication (TIDieR) checklist.

Who can participate?
We will include individuals aged 18 years and over with posttraumatic wrist pain seeking care at the Department of Hand Surgery in Malmö and assessed by a hand or orthopedic surgeon as not requiring surgical intervention. The diagnosis will be based on the individual’s medical history, symptom location, a comprehensive wrist examination, and radiographs.

What does the study involve?
This development and feasibility study comprises of two parts. First, the PROWRIST program will be developed by the research team in collaboration with additional clinical experts. Second, the feasibility of the program will be evaluated in individuals with post-traumatic wrist pain. This evaluation will focus on treatment experience and outcomes, program content and delivery, user preferences, and perceived barriers and facilitators.
Based on these findings, the final version of the PROWRIST program will be drafted. The program will then be structured and described in detail according to the Template for Intervention Description and Replication (TIDieR) checklist, to support evaluation in a future

randomized controlled trial (RCT).
The program development process follows the Guidance for Reporting of Intervention Development (GUIDED) recommendations.

What are the possible benefits and risks of taking part?
The PROWRIST program is a non-invasive, low-risk exercise therapy intervention. Participants may experience temporary fatigue and/or pain during or after exercise, but this is considered to be temporary. To minimize discomfort and potential risks, all participants will receive thorough instructions adjusted to individual needs by experienced physiotherapists. Exercises will be adapted as needed to suit individual capabilities and responses. If pain or discomfort persist despite adjustments, this will be investigated further and, if necessary, participation in the study will be discontinued. The anticipated benefits of participation include improved understanding of the condition, pain reduction and enhanced functional outcomes

Where is the study run from?
The study is conducted at the Department of Hand Surgery, Skåne University Hospital in Malmö, Sweden – a tertiary healthcare facility that receives referrals for hand and wrist injuries from across the Southern Sweden healthcare region.

When is the study starting and how long is it expected to run?
The development of the PROWRIST program began in May 2025, with participant inclusion in the feasibility part of the study planned to begin in February 2026. The study is expected to be completed by December 2026.

Who is funding the study?
The trial is supported by grants from Lund University and Skåne University Hospital, governmental funding for clinical research within the National Health Service (NHS).

Who is the main contact?
Docent, Elisabeth Ekstrand, elisabeth.ekstrand@med.lu.se

Contact information

Type(s)
Scientific, Principal investigator

Contact name
Dr Elisabeth Ekstrand

ORCID ID
https://orcid.org/0000-0001-6107-5258

Contact details
Handkirurgi Rehabilitering
Jan Waldenströmsgata 5
Malmö
Sweden
21420
-
elisabeth.ekstrand@med.lu.se

Type(s)
Public

Contact name
None Maria Sontag

Contact details
Handkirurgi rehabilitering
Jan Waldenströmsgata 5
Malmö
Sweden
21420
+46 (0)40336782
maria.sontag@skane.se

Additional identifiers

Study information

Scientific Title
Development and feasibility of PROWRIST: a 12-week home-based progressive exercise and patient education program for individuals with post-traumatic wrist pain

Acronym
PROWRIST

Study objectives
The aim of this study is to describe the development and to evaluate the feasibility of PROWRIST, a 12-week progressive rehabilitation program for individuals with post-traumatic wrist pain. The program consists of a progressive exercise program combined with structured patient education. The PROWRIST program aims to improve wrist function, reduce pain, and enhance activity performance through gradually increasing load, difficulty, and movement complexity, with a strong focus on effective transfer to daily activities.

PROWRIST will be developed through a co-creative process involving clinical experts and will be evaluated among end users, individuals with post-traumatic wrist pain.

Ethics approval required
Ethics approval required

Ethics approval(s)
1. Approved 25/11/2025, Swedish Ethical Review Authority (Box 2110, Uppsala, 750 02, Sweden; +46 (0)10-4750800; registrator@etikprovning.se), ref: 2025-07147-02

2. Approved 21/08/2024, Swedish Ethical Review Authority (Box 2110, Uppsala, 750 02, Sweden; +46 010-4750800; registrator@etikprovning.se), ref: 2024-04455-01

Primary study design
Interventional

Study design
Single-centre feasibility study

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Post-traumatic wrist pain

Interventions
The PROWRIST program will be developed through a multi-stage co-creative process involving the research group and additional clinical experts. Clinical experts will be engaged at an early stage via a workshop and will subsequently be invited to review and provide feedback on the program.

The participants will engage in a home-based, 12-week PROWRIST program combining progressive exercises and structured patient education with self-management strategies, with follow-up appointments every 2 to 3 weeks, which can be conducted in person or replaced by digital sessions if needed. A member of the research team, together with experienced physiotherapists at the Hand Surgery Department in Malmö, will be responsible for delivering and supervising the program. Prior to starting PROWRIST, each participant will have a consultation with the treating physiotherapist to discuss the treatment plan, set individual goals, and receive detailed instruction on the exercises. During this session, participants will also be guided through the educational content and taught how to apply self-management strategies, such as pacing, goal-setting, and problem-solving. During the follow-up sessions, the therapist will provide ongoing feedback to ensure correct exercise performance and to reinforce self-management strategies, with the aim of enhancing wrist function, reducing pain, and facilitating the transfer of exercises to daily activities.

The program includes two main types of exercises, organized in three phases: 1) daily exercises performed once a day, focusing on wrist-specific movements, and 2) weekly exercises performed three times a week, consisting of a more comprehensive set of multi-joint exercises targeting the proximal muscles and core strength. The educational content and self-management strategies are integrated throughout the program to support adherence, facilitate recovery, and enhance the transfer of improvements to daily activities.

Intervention Type
Behavioural

Primary outcome(s)
All primary outcome measures related to the feasibility of the PROWRST program will be assessed after completion of the program at 12 weeks:
1. The acceptability of the treatment program (PROWRIST) will be assessed through interviews after completion. The interviews will address perceptions of the program content, duration, number of exercises, home-based format, clinical follow-ups with the physiotherapist, and perceived level of difficulty. Participants will also be asked about perceived effects on wrist symptoms, the outcome measures used, experiences of the educational component, and to identify beneficial and less beneficial aspects of the program, any missing components, and potential areas for improvement. Based on the input from the participants, the PROWRIST program will be further refined and developed.
2. The participants' perceptions of difficulties or barriers encountered during treatment with

PROWRIST program will be evaluated with the extended and Swedish version of the Problematic Experiences of Therapy Scale (PETS). The extended PETS comprises six subscales capturing different types of problematic experiences related to therapy. Items are rated on a 5-point Likert scale ranging from 1 to 5, with higher scores indicating more problematic experiences or greater perceived barriers. Subscale scores are calculated by summing or averaging item responses within each domain, with higher scores reflecting greater treatment-related difficulties.
3. Adherence to the PROWRIST program will be assessed with the participants logging their exercise sessions in a training diary. Participants will be classified as adherent if they complete the prescribed number of sets and repetitions in at least 75% of the scheduled sessions, which is the predefined adherence threshold for the feasibility evaluation.
4. Adverse events, such as increased pain, swelling, stiffness, or new symptoms, will be evaluated and registered during the clinical follow-ups with the treating PT to ensure participant safety and to guide any necessary modifications to the program, and at the end of the training period.
5. The need for conversion to other treatments, such as corticosteroid injections or surgery, will be evaluated at the 12-week follow-up.

Key secondary outcome(s)

All secondary objective and patient-reported outcome measures (PROMs) will be evaluated at baseline and at the 12-week follow-up.

Objective outcome measures:
1. Wrist range of movement (extension, flexion, ulnar- and radialdeviation, pro- and supination) will be measured with a goniometer (degrees).
2. Isometric grip strength, three trials for each hand with a mean value (kilograms, kg), will be measured using the Jamar hydraulic hand dynamometer.
3. The wrist's weight-bearing capacity will be evaluated using the Push-Off Test (POT), performed with a Jamar hydraulic hand dynamometer according to previously described and validated instructions. Three trials for each hand will be recorded and the mean value, recorded in kilograms (kg), for each hand was calculated.
4. Wrist lifting strength will be evaluated using a Kern dynamometer. Three trials will be conducted for each hand, and the mean value of the measurements is calculated and expressed in Newton meters (Nm).
5. The strength component of the Constant score will used to assess shoulder strength. Measurements will be obtained using a digital spring balance dynamometer with force expressed in pounds (lb). Three attempts will be performed for each shoulder, with a minimum rest interval of one minute between trials, and the highest value will be recorded.

Patient- reported outcome measures (PROMs):
1. Pain will be measured using the Numeric Pain Rating Scale (NPRS). The NPRS is an 11-point scale (0–10) where 0 indicates no pain and 10 the worst imaginable pain.
2. Wrist pain and function will be evaluated with the Patient Rated Wrist Evaluation (PRWE). PRWE is a wrist-specific PROM designed to assess pain and disability in daily activities over the past week. It consists of a pain subscale (five items) and a function subscale (10 items), with a total score ranging from 0 to 100, where a higher score indicates greater disability.
3. Self-reported upper extremity physical function and symptoms will be rated with the Swedish version of Disabilities of the Arm, Shoulder, and Hand (DASH). DASH is a PROM assessing upper extremity physical function and symptoms on a scale from 0-100, 100 represents most severe disability, whereas 0 characterise no disability.
4. The Patient Specific Functional Scale (PSFS) will be used for collaborative goal setting, allowing participants to identify and rate personally meaningful activities affected by their wrist

condition on a 0–10 scale, with higher scores indicating better function.
5. The Swedish version of the Pain Self-Efficacy Questionnaire short form (PSEQ-2SV) will be used to assess pain-related self-efficacy. The PSEQ-2SV consists of two items that measure an individual's confidence in performing daily activities despite pain. Each item is rated on a 7-point Likert scale ranging from 0 ("not at all confident") to 6 ("completely confident"), yielding a total score from 0 to 12, with higher scores indicating greater pain self-efficacy.
6. Health-related quality of life will be assessed using the EQ-5D-5L, a standardized EuroQol questionnaire covering five domains (mobility, self-care, usual activities, pain/discomfort, and anxiety/depression), each rated on five levels. It also includes the EQ Visual Analogue Scale (EQ VAS), a 20 cm vertical scale for self-rated health ranging from "the best health you can imagine" to "the worst health you can imagine."
7. The Global Rating of Change (GROC) is an 11-point scale (-5 to +5) assessing perceived change since treatment, where -5 means "a very great deal worse," 0 "about the same," and +5 "a very great deal better". Participants will rate: "Considering how your wrist functioned before the treatment, how would you rate your wrist function now?"
8. The Patient Acceptable Symptom State (PASS) will be used to assess whether participants considered their symptom state satisfactory following the intervention. The PASS identifies patients who consider themselves well and is evaluated using a dichotomous (yes/no) anchor question asking participants whether they perceived their current wrist condition as satisfactory, taking into account wrist function in daily activities, sports and recreational activities, pain and other symptoms, and wrist-related quality of life.

Completion date
31/12/2026

Eligibility

Key inclusion criteria
1. Diagnosed partial wrist ligament injuries, distortions, or other post-traumatic and symptomatic wrist conditions with no structural carpal malalignment
2. Wrist pain ≥3 months

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
18 Years

Upper age limit
100 Years

Sex
All

Total final enrolment
0

Key exclusion criteria
1. Total wrist ligament injuries, carpal malalignment such as dorsal intercalated segment instability (DISI) and volar intercalated segment instability (VISI), surgically treated or acute wrist ligament injuries
2. Previous surgery to the wrist
3. Intra-articular wrist cortisone injection within the last 3 months
4. Wrist fractures, or ongoing upper extremity fracture healing
5. Radiocarpal osteoarthritis ≥ grade 2
6. Inability to understand and follow test instructions due to communicative, mental, or cognitive impairments.

Date of first enrolment
15/02/2026

Date of final enrolment
31/12/2026

Locations

Countries of recruitment
Sweden

Study participating centre
Department of Hand Surgery
Skåne University Hospital
Jan Waldenströmsgata 5
Malmö
Sweden
205 02

Sponsor information

Organisation
Skåne University Hospital

ROR
https://ror.org/02z31g829

Funder(s)

Funder type
Not defined

Funder Name
Lunds Universitet

Alternative Name(s)
Lund University, Universitas Lundensis, Universitas Gothorum Carolina, Royal Caroline Academy, Regia Academia Carolina, Lund University | Lund, Sweden | LU, Lunds universitet, LU

Funding Body Type
Government organisation

Funding Body Subtype
Universities (academic only)

Location
Sweden

Funder Name
Skåne University Hospital

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study will be stored in an non-publicly available repository on a secure storage platform of Region Skane. The secure storage platform is password-protected, requires login with a SITS card, and is only accessible to the participating researchers.
The datasets generated and/or analyzed during the current study will not be publicly available due to restrictions under the Swedish Public Access to Information and Secrecy Act (https://www.government.se/information-material/2009/09/public-access-to-information-and-secrecy-act/). Data can be obtained from the corresponding author upon reasonable request, but access to data requires special review and approval of the research project by both the Swedish Ethical Review Authority and the governmental data safety committees.

IPD sharing plan summary
Stored in non-publicly available repository