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**Title**

Comparison of three different orthoses on the effects of pain and daily function of carpometacarpal thumb arthrosis

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None

**Summary**

This single centre prospective randomised study will compare our standard treatment of osteoarthritis of the thumb carpometacarpal joint consisting of both prefabricated splints and custom-made splints with 3D patient-specific printed splints.

**Introduction/ basics**

Thumb base OA is a highly prevalent chronic condition that causes pain, limits hand function, and interferes with day-to-day activities. Surgical intervention can provide relief but is invasive and expensive. Non-operative treatment includes splinting, which aims to provide external support to the joint and reduce pain. In general, high to moderate level of evidence can be found for the use of splints with a reduction in pain. However, a large heterogeneity can be found in the types of orthoses, as splints are made of a variety of materials and have varied designs. As such, hard evidence is lacking as to which splint is the most effective. The increase in manufacturing capabilities of 3D printing have created the ability to create patient-specific 3D printed splints. So far, no studies have looked at the possible effect of 3D printed orthoses on pain, function and patient satisfaction.

**Material method; implementation/ process**

We are conducting a single center, prospective randomized controlled study at the Orthopaedic department of AZ Herentals, Belgium. All patients presenting with thumb base osteoarthritis, and meeting the inclusion criteria are included in the study and will be followed for one year. The study will end when the last included patient has passed the 1-year follow-up. Treatment is based on the current treatment guideline of our hospital. Patients are randomised to a custom-made IMF (immediate fitting), prefabricated (Push®) or 3D-printed orthosis. Patients

are instructed to wear the splint (almost) 24 hours a day during the first 6 weeks to give the thumb rest, reduce inflammation and improve stability in the joint. After this period patients will be advised to use the splint only during heavy activities, depending on the pain level and the patient's ability to perform activities with a stable thumb position. Patients are asked for NRS pain score, FIHOA,

## Results

Final results will be available January 2023. A total of 133 patients have been included for 156 braces (some patients had thumb OA bilaterally). For the prefabricated brace, a total of 52 patients have been included, for the IMF brace 35 patients and for the 3D brace 46 patients. So far, 58 patients have reached the 6 weeks evaluation, 23 patients the 3 months and 7 patients the 6 months evaluation.

## Discussion/ conclusion; conclusion for the practice

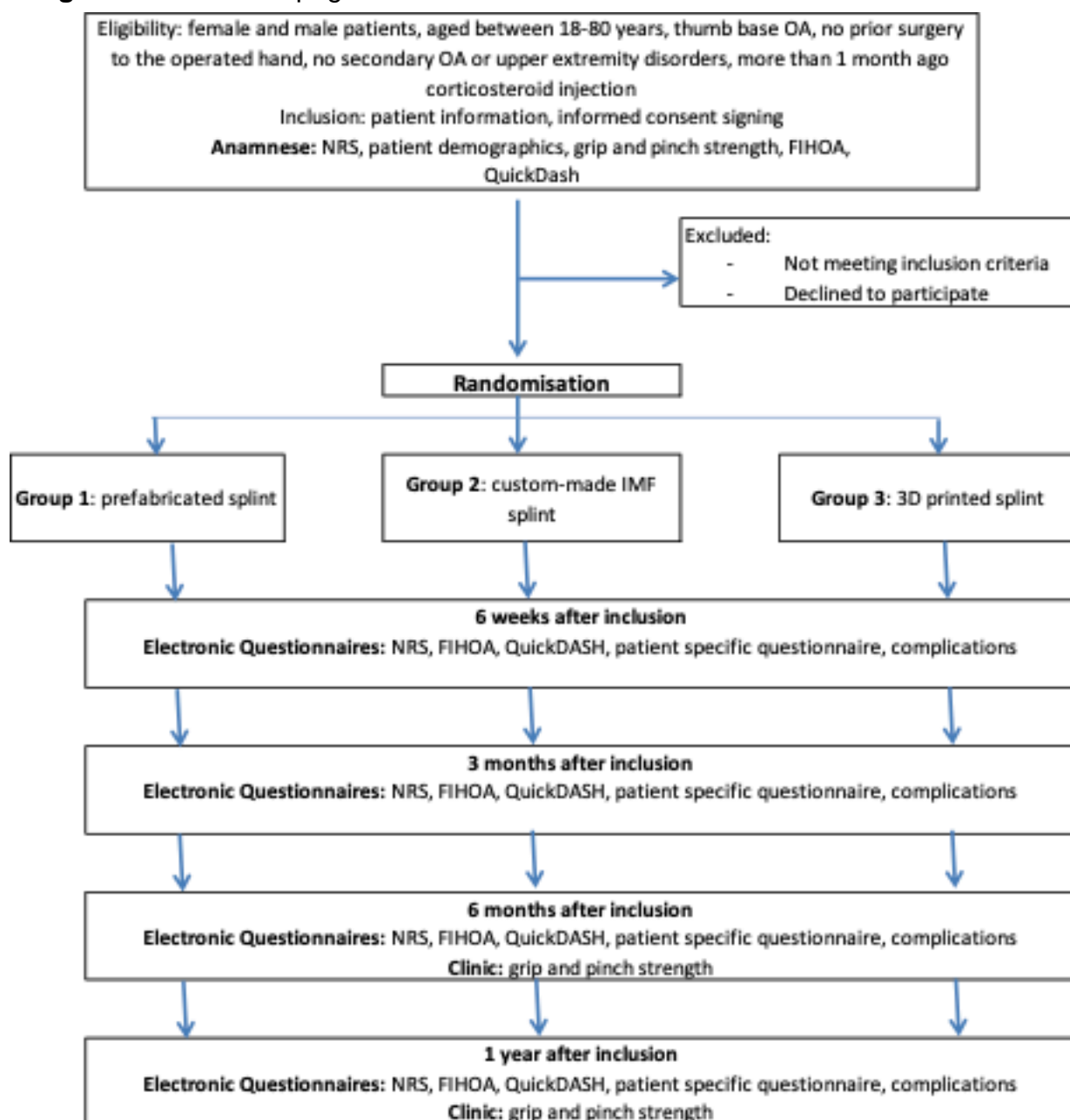
Preliminary results will be available March 2022.

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