

# Value of body-worn sensors to assess functioning in the follow-up of patients with a hip fracture

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<b>Registration date</b> 30/01/2023	<b>Overall study status</b> Completed	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
<b>Last Edited</b> 27/05/2025	<b>Condition category</b> Surgery	<input type="checkbox"/> Individual participant data <input checked="" type="checkbox"/> Record updated in last year

## Plain English summary of protocol

### Background and study aims

Osteoporotic hip fracture treatment remains challenging both due to the increasing age of the population and the high number of complications including death. As a consequence, multiple guidelines have been developed during the last decades to improve the care for geriatric hip fracture patients. Early surgery (surgery within 24 to 48 hours after admission), as well as early mobilization after surgery allowing for full weight bearing, have been proven to be important process indicators. To evaluate the postoperative functionality of geriatric hip fracture patients, both patient-reported, as well as observer-based measurement methods, are used. The aim of this study is to explore the added value of wearable technology for evaluating postoperative functionality through continuous measurement of posture and movement.

There are two primary study aims:

1. To describe patient-reported and observer-based evaluations of functional status during hospitalization for geriatric hip fracture treatment and at follow-up consultations at 6 weeks, 3 months and 6 months after surgery.
2. To evaluate the responsiveness of patient-reported, observer-based and sensor-provided functional assessment methods.

### Who can participate?

Patients undergoing surgical repair for proximal femoral fracture, aged 50 years or over, allowed to execute any form of weight bearing

### What does the study involve?

Detailed longitudinal follow-up of functioning using patient-reported, sensor-based and observer-based assessments of functioning up to 6 months after surgery.

### What are the possible benefits and risks of participating?

Participating will help with the development of feasible, reliable and valid assessments of functioning. This will help with the detection of unfavourable functional outcomes in patients undergoing hip fracture repair. There are no risks associated with this study

Where is the study run from?

1. University Hospitals Leuven (Belgium)
2. KU Leuven (Belgium)

When is the study starting and how long is it expected to run for?

April 2021 to April 2024

Who is funding the study?

1. University Hospitals Leuven (Belgium)
2. KU Leuven (Belgium)

Who is the main contact?

Prof Dr An Sermon (Belgium)

an.sermon@uzleuven.be

## Contact information

### Type(s)

Principal investigator

### Contact name

Prof An Sermon

### Contact details

Herestraat 49

Leuven

Belgium

3000

+32 (0)16344592

an.sermon@uzleuven.be

### Type(s)

Scientific

### Contact name

Mr Thijs Swinnen

### Contact details

Herestraat 49

Leuven

Belgium

3000

+32 (0)16 34 05 13

thijs.swinnen@uzleuven.be

### Type(s)

Public

### Contact name

Ms Elga Nijs

## Contact details

Herestraat 49  
Leuven  
Belgium  
3000  
+32 (0)1642364  
elga.nijs@uzleuven.be

## Additional identifiers

### Clinical Trials Information System (CTIS)

Nil known

### ClinicalTrials.gov (NCT)

Nil known

### Protocol serial number

Nil known

## Study information

### Scientific Title

Added value of a technology-driven assessment of functioning in patients with proximal femoral fracture

### Acronym

IMU

### Study objectives

1. To describe and compare patient-reported, observed, and technology-measured assessments of physical function (physical activity and functionality) during hospitalization and during follow-up consultations up to 6 months over time in patients with proximal femoral fracture.
2. To compare the responsiveness of patient-reported, observed, and technology-measured assessments of physical functioning (physical activity and functionality) in patients with proximal femoral fracture.

### Ethics approval required

Old ethics approval format

### Ethics approval(s)

Approved 21/05/2021, Ethics Committee Research UZ/KU Leuven (Herestraat 49, 3000 Leuven, Belgium; +32 (0)16 34 86 00; ec@uzleuven.be), ref: S65163

### Study design

Single-centre prospective interventional study with retrospective use of Good Clinical Practice data

### Primary study design

Interventional

**Study type(s)**

Other

**Health condition(s) or problem(s) studied**

Surgical repair of proximal femur fractures in patients older than 50 years

**Interventions**

This study is a monocentric prospective study with an intervention (additional use of one sensor on the chest without health risk to the patient), with retrospective use of Good Clinical Practice (GCP) data collected from 01-01-2021 to 22/04/2021 (physical activity measured by one similar sensor on the leg, the Timed-Up-and-Go test and observation of functioning during the hospitalization period).

After surgery, a sensor will be attached to the affected leg and the chest as soon as possible. This sensor measures physical activity throughout the hospitalization period. These sensors will be re-installed during a consultation at 6 weeks, 3 and 6 months after surgery to measure physical activity for at least 7 days at home. In addition, participants complete several questionnaires: Global Ratings of Perceived Effect, Parker Mobility Score, Pain Assessment, Fall Efficacy Scale and questionnaires on the ease of use of sensor measurements.

In addition, the researchers will perform the following measurements: Harris Hip Score, the Morton Mobility Index (DEMMI) and the timed up-and-go (TUG) test.

Finally, the researchers will also collect general information from the patients' medical records, as well as information about the surgery and rehabilitation.

**Intervention Type**

Mixed

**Primary outcome(s)**

1. Patient-reported functional status assessed using the Harris Hip Score: Pre-surgery status at day 9 after surgery; week 6, and months 3 and 6 after surgery
2. Observed functional status assessed using DEMMI at Day 9, week 6, and months 3 and 6 after surgery
3. Performance-based functional status assessed using TUG test at Day 9, week 6, and months 3 and 6 after surgery
4. Physical activity assessed using activity sensors during hospitalisation, at least 7 days at home, week 6, and months 3 and 6
5. Health status assessed using Global ratings of perceived effect at week 6, and months 3 and 6

**Key secondary outcome(s)**

The following outcomes will be extracted from the patients' medical records or questioned to the patient during hospitalisation and at day 9, week 6, months 3 and 6 after the surgery:

1. Pre-surgery status assessed at day 9 after surgery
2. Demographics and anthropometrics
3. Medical history
4. Time of admission, surgery
5. Surgical procedure, history of hip surgery
6. Time to start mobilization and gait rehabilitation, number and timing of physical therapy sessions
7. Date of admission, medical discharge and discharge (calculation of admission time, admission

time until medical discharge)

8. Mental status assessed using a categorical clinician score (electronic patient record), at all time points

9. Comorbidity assessed using the American Society for Anaesthesiologists Physical Status classification

10. Comorbidity assessed using the Charlson Comorbidity Index

11. Medication schedule

12. Fear of falling assessed using the Fall Efficacy Scale

13. Mortality

14. Pain assessed using Numerical Rating Scale

15. Participation assessed using the Parker Mobility Score

16. Feasibility of sensor measurements assessed using Numerical Rating Scale

### **Completion date**

26/04/2024

## **Eligibility**

### **Key inclusion criteria**

1. Surgical treatment of proximal femur fracture

2. Age >50 years

3. Immediate weight bearing allowed after surgery

### **Participant type(s)**

Patient

### **Healthy volunteers allowed**

No

### **Age group**

Other

### **Sex**

All

### **Key exclusion criteria**

1. Revision surgery (affected leg)

2. Pathological fracture

3. Preoperative bedridden, not able to stand up

4. Current COVID-19 infection or other infectious risk requiring isolation

5. Polytrauma/multiple injuries

### **Date of first enrolment**

21/05/2021

### **Date of final enrolment**

21/05/2025

## **Locations**

**Countries of recruitment**

Belgium

**Study participating centre**

**UZ Leuven**

Herestraat 49

Leuven

Belgium

3000

## **Sponsor information**

**Organisation**

Universitair Ziekenhuis Leuven

**ROR**

<https://ror.org/0424bsv16>

## **Funder(s)**

**Funder type**

University/education

**Funder Name**

KU Leuven

**Alternative Name(s)**

Katholieke Universiteit Leuven

**Funding Body Type**

Private sector organisation

**Funding Body Subtype**

Universities (academic only)

**Location**

Belgium

## **Results and Publications**

## Individual participant data (IPD) sharing plan

Data are available on reasonable request from the corresponding study lead, Prof Dr An Sermon (an.sermon@uzleuven.be), but not publicly, given possible intellectual property affairs related to raw sensor data processing or classification algorithms in this specific population.

## IPD sharing plan summary

Available on request

## Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Participant information sheet</a>	Participant information sheet	11/11/2025	11/11/2025	No	Yes