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Digital triage after knee replacement surgery to reduce unnecessary in-person follow-up visits

Submission date
18/08/2026

Recruitment status
Recruiting

Registration date
19/08/2026

Overall study status
Ongoing

Last Edited
19/08/2026

Condition category
Surgery

[X] 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
After a knee replacement, patients are routinely invited to attend an outpatient check-up at around 8 weeks after surgery. In practice, many patients recover well with no complications, yet everyone is asked to come in regardless of how their recovery is going. This study investigates whether a short digital questionnaire via a smartphone app can help identify patients who are recovering well and who do not need a routine in-person check-up, without putting patient safety at risk.

Who can participate?
Adults aged 18 years or older who have had a primary total knee replacement due to osteoarthritis at one of the participating hospitals in the Netherlands

What does the study involve?
Participants are randomly assigned to one of two groups. In both groups, a scheduled outpatient check-up at 8 weeks after surgery is planned as usual care. All participants use a smartphone app that sends them a short questionnaire 6 weeks after their operation, asking about pain, knee movement, wound healing, and how their physiotherapist rates their recovery.
In the control group, the standard 8-week outpatient appointment goes ahead as planned regardless of the questionnaire answers. This reflects current usual care.
In the intervention group, the answers are used to assess whether recovery is going well. Only if all four indicators suggest uncomplicated recovery, the participant receives one additional question through the app asking whether they would be willing to skip the scheduled appointment. If the participant indicates they are open to this, their answers and preference are shared with their treating healthcare provider, who makes the final decision on whether to cancel the appointment. The appointment is only cancelled if the provider independently agrees that recovery is uncomplicated and that no in-person visit is needed. At any point, participants can change their mind and request an in-person appointment.
All participants complete further questionnaires through the app at 90 days after surgery, measuring pain, knee function, and quality of life.

What are the possible benefits and risks of participating?
Participants who are recovering well may not need to travel to the hospital for a routine check-

up. Care is more closely matched to individual needs. There are no additional medical procedures. The only extra action required is answering one additional question in the app for participants in the intervention group who recover well. An appointment is only cancelled when both the patient and their healthcare provider agree it is not needed. Participants can request a physical appointment at any time.

Where is the study run from?
Radboud University Medical Centre (Radboudumc) (Netherlands)

When is the study starting and how long is it expected to run for?
September 2026 to July 2027

Who is funding the study?
Radboud University Medical Centre (Radboudumc) (Netherlands)

Who is the main contact?
Casper Craamer, casper.craamer@radboudumc.nl

Contact information

Type(s)
Public, Scientific, Principal investigator

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Additional identifiers

Study information

Scientific Title
Digital triage after total knee arthroplasty: a randomised controlled trial to reduce unnecessary in-person follow-up visits

Study objectives
The aim of this study is to investigate the extent to which a digital triage strategy can safely contribute to a reduction in routine 8-week in-person follow-up appointments among patients with an uncomplicated recovery following total knee arthroplasty.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 12/06/2026, Medical Ethics Committee Zuyd-Máx (De Run 4600, Veldhoven, 5504 DB, Netherlands; +31 (0)88 4590129; metczuydmax@zuyderland.nl), ref: N26.044

Primary study design
Interventional

Allocation
Randomized controlled trial

Masking
Open (masking not used)

Control
Active

Assignment
Parallel

Purpose
Health services research

Study type(s)

Health condition(s) or problem(s) studied
Routine follow-up regimens in patients after total knee arthroplasty

Interventions
Participants undergoing primary total knee arthroplasty (TKA) who meet the eligibility criteria are enrolled and randomised to one of two postoperative follow-up strategies. Randomisation is performed at the individual patient level. Participants are randomised on a 1:1 basis to either the control arm or the intervention arm using a computerised randomisation system. No blocking or stratification is applied. Randomisation is performed across all participating centres without restriction.

All participants use a mobile application that delivers a digital triage questionnaire at 6 weeks postoperatively, evaluating recovery based on predefined clinical indicators including pain control, knee function, wound status, and physiotherapist satisfaction.

Control arm: Participants receive standard postoperative care, consisting of a scheduled in-person outpatient follow-up consultation at 8 weeks postoperatively. Questionnaire responses at 6 weeks postoperatively are not used for triage purposes and do not influence the scheduled appointment. This reflects usual care.

Questionnaire responses are used to determine whether recovery is uncomplicated or whether deviations from the expected course are present. If recovery is assessed as uncomplicated, the participant receives one additional question via the application asking whether they are willing to forgo the scheduled 8-week follow-up appointment. This additional question is only

presented to participants whose questionnaire responses meet all predefined criteria for uncomplicated recovery. If the participant indicates they are open to forgoing the appointment, the questionnaire responses together with the participant's preference are forwarded to the treating healthcare provider, who makes the final decision on whether to cancel the appointment. The appointment is cancelled only if the provider independently confirms the uncomplicated recovery and endorses the patient's preference to forgo the visit. At all times, participants retain the right to change their preference or to contact their healthcare provider to schedule an in-person appointment.

All participants are followed up to 90 days postoperatively. At 90 days, the application administers validated patient-reported outcome measures (Knee injury and Osteoarthritis Outcome Score [KOOS], EuroQoL 5-Dimension [EQ-5D], and Numeric Rating Scale [NRS]) to assess symptom burden, health-related quality of life, and pain.

Intervention Type
Other

Primary outcome(s)
1. The proportion of participants in the intervention group who ultimately forgo the routine 8-week in-person follow-up appointment following completion of all three steps: uncomplicated recovery on digital triage, patient preference to forgo the appointment, and validation by the treating healthcare provider, measured using the proportion (percentage) of participants in the intervention group who have their 8-week outpatient follow-up appointment cancelled at 8 weeks postoperatively

Key secondary outcome(s)
1. Complications, hospital readmissions, and additional unplanned healthcare contacts measured using the incidence and number of events, extracted from electronic patient records at 90 days postoperatively

Completion date
31/07/2027

Eligibility

Key inclusion criteria
1. Age ≥18 years
2. Undergoing a primary total knee arthroplasty due to gonarthrosis
3. Digitally literate: able to use the digital application for telemonitoring and triage, independently or with the assistance of a caregiver
4. Able to provide informed consent for participation in the study

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. Revision total knee arthroplasty
2. Unicompartmental knee arthroplasty
3. Primary total knee arthroplasty for reasons other than gonarthrosis
4. Severe cognitive impairment
5. Insufficient proficiency in the Dutch language
6. No access to a smartphone or tablet
7. No access to internet or WiFi at home

Date of first enrolment
01/09/2026

Date of final enrolment
30/04/2027

Locations

Countries of recruitment
Netherlands

Study participating centre
Anna Hospital
Bogardeind 2
Geldrop
Netherlands
5664 EH

Study participating centre
Canisius Wilhelmina Hospital
Weg door Jonkerbos 100
Nijmegen
Netherlands
6532 SZ

Study participating centre

Alrijne Hospital
Simon Smitweg 1
Leiderdorp
Netherlands
2353 GA

Study participating centre
VieCuri Medical Center
Tegelseweg 210
Venlo
Netherlands
5912 BL

Sponsor information

Organisation
Radboud University Medical Center

ROR
https://ror.org/05wg1m734

Funder(s)

Funder type

Funder Name
Radboud Universitair Medisch Centrum

Alternative Name(s)
Radboudumc, Radboud University Medical Center, Radboud University Nijmegen Medical Center, RUNMC

Funding Body Type
Private sector organisation

Funding Body Subtype
Universities (academic only)

Location
Netherlands

Results and Publications

Individual participant data (IPD) sharing plan

The datasets generated during and/or analysed during the current study will be available upon request from Casper Craamer (casper.craamer@radboudumc.nl).

Type of data: Anonymised patient-reported outcome data and appointment registration data.
When available: Following publication of the primary results.
How long: For a minimum of 5 years following publication.
Access criteria: Reasonable requests from researchers for scientific purposes will be considered on an individual basis.
With whom: Qualified researchers with a legitimate scientific purpose.
Mechanism: Data will be shared upon written request and subject to a data sharing agreement.
Consent: Informed consent for data collection was obtained from all participants. Data sharing was not explicitly addressed in the consent procedure; data will therefore only be shared in fully anonymised form.
Anonymisation: All data will be fully anonymised prior to sharing. No directly or indirectly identifying information will be included.
Ethical/legal restrictions: Data sharing is subject to Dutch privacy legislation (Algemene Verordening Gegevensbescherming / General Data Protection Regulation) and the institutional data governance policies of Radboud University Medical Centre, Nijmegen, the Netherlands.

IPD sharing plan summary

Available on request