Trust Guideline for the Enhanced Recovery Programme for Total Hip Replacement (THR) and Total Knee Replacement (TKR)

Document Control: Clinical Guidelines

For Use In:	Norfolk and Norwich Hospital, Norfolk and Norwich Orthopaedic Centre (NANOC) Enhanced Recovery Programme for Primary Hip and Knee Replacements in Adults For use in operating theatres, Pre-admission clinic, NNUH Orthopaedic Wards, including Norfolk & Norwich Orthopaedic Centre.		
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5	10/10/23	Updates to include recommendations from GIRFT for enhanced recovery hip & knee replacements	Ben Cracknell, James Wimhurst, Amy Benterman
6	15/02/24	Updates of thromboprophylaxis, pain control, discharge medications	James Wimhurst
7	July 2024	Updated on page 18 following	Amresh Singh

		update from thrombo-embolic committee.	
8	October 2024	Update to section 3.4 by anaesthetists Related documents section added	Amresh Singh

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Distribution Control

Printed copies of this document should be considered out of date. The most up to date version is available from the Trust Intranet.

Trust Intranet, Orthopaedic Wards, NANOC, Orthopaedic Theatres, Theatre Recovery, Orthopaedic Surgeons, Anaesthetists, Acute Pain Team, Physiotherapy Department, Occupational Therapy Department.

Consultation

The following were consulted during the development of this document:
Roger Garforth, Morne Wolmerans, Consultant Anaesthetists, Hamish Lyall, Consultant Haematologist, Sarah Wood, Consultant Urologist,
Sarah Hazelden, Physiotherapy Service Lead, Yvonne Walker, Senior Orthopaedic Nurse Practitioner, Lucy Harness, Orthopaedic Clinic Sister, Claire Brown, Orthopaedic ward Sister, Daryl Tan, Surgical Care Practitioner, Michala D'Elia, Dietician, Ketan Dhatariya, Consultant in diabetes and endocrinology, Vera Borges, Orthopaedic Nurse Practitioner

During its development, this guideline has been circulated for comment to: representatives of the Anaesthetic Department, the Orthopaedic Department, the Pharmacy Department, Senior Elective Nursing staff, the Physiotherapy Department and the Occupational Therapy Department. Advice has been received from urology, haematology & endocrinology departments.

Monitoring and Review of Procedural Document

The document owner is responsible for monitoring and reviewing the effectiveness of this Procedural Document. This review is continuous however as a minimum will be achieved at the point this procedural document requires a review e.g. changes in legislation, findings from incidents or document expiry.

Trust Guideline for the Enhanced Recovery Programme for Total Hip Replacement (THR) and Total Knee Replacement (TKR)

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Quick reference

- Length of Stay (LoS) target reinforced at all stages: 25% may be suitable for Day Case Surgery, the majority discharged on Day 1 post-operatively & an overall median LoS of 2 days achieved across the Norfolk and Norwich university Hospitals NHS Foundation Trust (NNUH) and Norfolk and Norwich Orthopaedic Centre (NANOC)
- Inclusion of NICE / Getting it Right First Time (GIRFT) enhanced recovery guidance
- Pre-operative provision of patient education / pre-habilitation materials / multimedia at time of adding to waiting list
- Timely Pre-Operative Assessment (POA)
- Pre-admission consenting
- Pre-operative MRSA and MSSA decolonization
- Day of surgery admission
- Pre-operative and immediate post-operative high calorie carbohydrate drinks
- Spinal anaesthetic without opioid and appropriate local blocks for majority of patients
- High volume local anaesthetic infiltration at time of surgery
- Standardized post-operative analgesia regime.
- Mobilization within 1 hour of offset of spinal motor block
- Targeted physiotherapy to achieve early, safe discharge with a minimum of 2 daily sessions
- Rapid mobility progression and functional assessment for discharge
- Timely X-rays to facilitate early discharge
- Nurse-led, criteria-based discharge
- Patient to have access to a dedicated phone line to discuss post operative issues (OPAL: Orthopaedic Practitioner Advice Line & ward contact details)
- Post-operative well-being call to patients discharged within 24 hours, from ONP or SCP, at 24 & 72 hours post-discharge, with a follow up contact by the therapy team at day 2-3. Patients discharged between day 1-2 post operatively will also receive a wellbeing call by physiotherapy within 1 week and therapy team can escalate any concerns to the ONP/SCP in NANOC
- Nurse dressing clinic at 12 days for clip removal (knees) & dressing removal / wound check (hips) with physiotherapy availability for knee replacement patients as needed. Patients may also elect to access clip removal / wound checks at their GP surgery, if more convenient.
- Outpatient follow up at 6 weeks

1. Introduction

1.1. Rationale

Approximately 600 hip and 600 knee arthroplasties are performed at NNUH each year. In 2011, the Norwich Enhanced Recovery Programme (NERP) was introduced. Prior to NERP, the median length of stay (LoS) for joint replacements at NNUH was 8 days. This fell to 4 days within 6 months.

In 2024 our mean LoS is just under 3 days, with national average slightly lower at 2.7. A major factor in this has been the transfer of fitter patients to alternative providers. With the advent of the NANOC we aim to “repatriate” these patients and to improve further upon our LoS whilst maintaining patient safety and satisfaction. Getting It Right First Time (GIRFT) has released guidance which has been incorporated into this document & their recommendation is that at least 25% of patients should be able to be safely discharged on the day of surgery, with the majority home on day 1 post-operatively.

1.1.1. GIRFT recommendations

The GIRFT (March 2023) guide to delivering perioperative ambulatory care for patients with hip and knee pain requiring joint replacement surgery makes the following recommendations:

1. All patients are put on an ambulatory pathway by default, apart from patients who are pre-identified as requiring post-operative High Dependency Care.
2. Extension of physiotherapy services to support therapy discharge until 20.00hrs Monday to Friday and half day over the weekend across all elective caseloads.
3. Patient education programmes embed the expectation of a 0 or 1 night stay as the default.
4. Highly refined clinical pathways providing maximal patient optimisation and enhanced recovery. Small modifications in current practice can yield cumulatively powerful results in achieving shorter stay surgery – sharing of best practice developed in centres.
5. Reduce variation – adherence to protocols is critical for success.
6. Consolidate elective inpatient bed base. Reducing LoS offers opportunities to make efficient use of inpatient elective bed provision and protect the ring-fenced status of the required number of beds.
7. Multi-disciplinary engagement through clinical, managerial, and executive levels is paramount to success. Teams on the ground must be empowered by their Trust’s executive team and management structure to be supported to achieve change.

GIRFT requires that all patients should be admitted to a dedicated, ring-fenced orthopaedic ward.

1.2. Objective

The aim is to enhance the recovery of all patients having primary hip and knee replacements with a multimodal programme which facilitates early mobility and

discharge. This results in improved patient satisfaction and reduces risks of infection and thromboembolism.

The objective of this clinical guideline is to:

- Set out standardised pathways for patients from the pre to post operative stage and to reduce clinical variation.
- Achieve a streamlined pathway of care for arthroplasty patients leading to early mobilisation, safe discharge and appropriate post operative care.
- Provide standardised guidance on:
    - Education of patients and Health Care Professionals
    - Pre-operative Physiotherapy and Occupational Therapy information
    - Pre-operative anaesthetic, surgical and therapy assessments
    - Pre-operative therapy assessment will be performed virtually in liaison with POA and the wards management team.
    - Utilising surgical and anaesthetic techniques which facilitate early mobility
    - Excellent post-operative analgesia allowing early patient mobilisation
    - Intensive post-operative physiotherapy
    - Early discharge with appropriate back-up and follow-up
    - Incorporation of GIRFT 2023 guidance to delivering perioperative ambulatory care for patients with hip and knee pain requiring joint replacement surgery.

1.3. Scope

This document does not cover revision hip and knee arthroplasty or patients undergoing surgery at any other site apart from NNUH and NANOC.

1.4. Glossary

The following terms and abbreviations have been used within this document:

Term	Definition
NERP	Norwich enhanced recovery pathway
NNUH	Norfolk and Norwich University Hospitals
GIRFT	Getting It Right First Time
THR	Total hip replacement
TKR	Total knee replacement
UKR	Uni knee replacement
NANOC	Norfolk and Norwich Orthopaedic Centre
RCS	Royal college of Surgeons
GMC	Good Medical Council
PROMs	Patient related outcome measures
FBC	Full blood count
U&E	Urea and electrolytes

LOS	Length of stay
HDU	High dependency unit
WHO	World Health organisation
GA	General anaesthetic
LA	Local anaesthetic
PMH	Past medical history
VTE	Venous thrombo embolism
ASIS	Anterior superior iliac spine
CrCl	Creatinine clearance
TWOC	Trial without catheter
LWMH	Low molecular weight heparin
DOAC	Direct oral anticoagulants
OPAL	Orthopaedic practitioners advice line
ODEP	Orthopaedic data evaluation panel

2. Responsibilities

Aside from the authors listed above, this document was supported by

- Consultant Anaesthetists
- Consultant Haematologist
- Consultant Urologist,
- Physiotherapy Service Lead
- Senior Orthopaedic Nurse Practitioner
- Orthopaedic Clinic Sister
- Orthopaedic ward Sister
- Acting Deputy Chief Pharmacist
- Surgical Care Practitioner
- Dietician
- Consultant in diabetes and endocrinology
- Orthopaedic Nurse Practitioner.

All surgeons, anaesthetists and allied health care professionals involved in the patient pathway for patients undergoing primary hip and knee replacement surgery should be aware of these guidelines for use in clinical practice.

3. Policy Principles

3.1. First Consultation

Patients who have exhausted conservative management options for their condition may be listed for joint replacement surgery following good quality shared decision making. For patient additional

The Orthopaedic Health Screening Tool should be filled out by every patient being listed for joint replacement surgery & the “Traffic Light” system applied when adding

patients to the waiting list. Those patients identified as “green” or “amber” should be suitable for surgery in NANOC, whilst those with significant medical co-morbidities (“red”) will be accommodated in the NNUH main hospital inpatient orthopaedic ward (currently Cringleford Ward). This latter group may benefit from early anaesthetic assessment & can be referred at time of listing via: AnpoaRequests@nnuh.nhs.uk. However, unless these patients require HDU post-operatively, the enhanced recovery principles should still apply.

3.2. Consent

The patient should be consented in accordance with Royal College of Surgeons (RCS) and General Medical Council (GMC) guidelines. (RCS 2018, GMC 2020)

Consent is an ongoing process that begins from the first consultation and continues through the care episode. It is not ideal to formally obtain consent on the day of surgery. Patients undergoing surgery should have the opportunity to reflect on the planned surgery and may need to ask further questions. This may be particularly necessary if there is a significant delay or if there is need to clarify the surgical plan.

There should be either a consent clinic consultation within 6 weeks of surgery or consent gained by the surgical team at the time of pre-assessment.

Patients should be supplied with a copy of their consent form.

Patients sometimes have to be transferred from one surgical team to another to ensure equity in waiting time. It is not good medical practise that the patients meet the surgical team for the first time on the day of surgery. After the consent stage, the patient should stay with their specific surgical team throughout their onward care.

3.3. Patient education

Education is important in the setting of joint replacement as it reduces patients’ anxiety and reduces length of stay. It allows the patient a better understanding of the events in the peri and post-operative period.

The expected LoS should be discussed at all stages through the process. Patients planned for NANOC should be aware that they are likely to be ready to go home on the day of surgery or first post-operative day. Those planned for the in-patient orthopaedic ward should be counselled of a 1 or 2 day LoS.

Verbally delivered information will be supported by written material. This is in the form of a patient journey booklet that should follow the patient through all their appointments and brought in at the time of admission. This information will also available online.

Topics included in patient booklet include:

- Overview of surgical procedure, benefits, symptom management, risks, and complications.
- Expectations around pain management.

- Information about the benefits of spinal anaesthetic techniques, use of music and audiobooks.
- Early mobilisation and length of stay expectations, to facilitate optimal Patient Reported Outcome Measures (PROMs) and to avoid dissatisfaction from unmet expectations.
- Preparation for hospital stay and what to bring.
- Discharge planning and the need to prepare the discharge destination safety, ease and comfort. This may include stocking up on meals, clearing clutter in the home and storing items to avoid unnecessary bending or reaching. Preparation of appropriate sleeping facilities and any support the patient may require from friends and/or family should also be discussed.

3.4. Pre-Operative Assessment Clinic

This should be completed within 6 weeks of surgery and should include a pool of pre-assessed patients who can fill in last minute cancellations. 'As part of the pre-assessment and listing process, reference should be made to the health screening tool for orthopaedic procedures (Trust Docs (nnuh.nhs.uk)) to assess the best location for the patients operation. ASA 1 and 2 patients, with a BMI <40 and aged <85 who fit into the low risk group can be listed as NANOC suitable. Medium risk patients (age >85 with no risk factors on orthopaedic health screening tool, <85 with 1 risk factor, BMI <45, or ASA3) might be suitable for NANOC, as decided by the listing surgeon, or with input from anpoarequests@nnuh.nhs.uk if in doubt. High risk patients are suitable for the NNUH main site only.'

Factors that should be optimised before considering surgery:

- Anaemia – Patients should be screened. Pre-operative anaemia has been shown to increase mortality, acute kidney injury and infection. (Munting et al 2019) The transfusion of a single unit in surgical patients has also been shown to increase mortality and morbidity. (Ferraris et al 2012)
- The locally agreed Hb is > 130g/dL, although it is recognised that “normal” Hb for some female patients may be between 120 & 130g/dL. If patients are found to be anaemic, they should be referred to their GP for investigation and treatment of their anaemia.
- Patients with diabetes – HbA1c should ideally be <69 mmol/l. If above this level, patients will be referred to their GP or diabetic team for optimisation.
- Preoperative assessment protocol to be followed regarding actions required for out-of-range investigation results (eg U&Es) this may include deferring the patient until health is optimised
- Infection – Skin examination of the lower limbs. MRSA and MSSA screening and decontamination protocols. Medication review – Patients should be reviewed by the clinical pharmacy team who will obtain a full medication history and provide advice in the pre, peri and post-operative period. Patients are instructed to bring all current medications to their POA appointment. Guidelines on how anticoagulant medications should be administered or omitted in the peri-operative period are in place. ACEi/A2RB drugs should be withheld from 24 hours before admission.

- A 200ml Fresubin Energy Fibre drink (300kcal / 11.2g pr/36g CHO) drink is supplied to the patient. This should be avoided in patients with diabetes to avoid perioperative hyperglycaemia.
- Analgesia – the standard post-operative analgesia protocol will be discussed with the patient. Those taking opioids will be identified for potential pre-operative weaning and/or post-operative requirements.
- Occupational therapy virtual review to anticipate equipment and care needs
- Urine Screening – routine urine screening is not indicated unless patient symptomatic. Separate guidance exists for those with symptoms on TrustDocs.

3.5. Admission

Patients should be admitted on the day of surgery. Admissions should be staggered to minimise pre-operative fasting and reduce anxiety. For a four joint list, the first 2 patients will be admitted at 7am, the second two at 11am.

The consent form signed earlier in the process should be confirmed with the patient on the day. The surgical site is verified and marked. The mark should be visible after skin preparation and draping so it can be checked prior to skin incision.

Thromboprophylaxis risk assessment is completed on EPMA.

3.6. Peri-operative fasting

Patients should stop taking solid food 6 hours before surgery, this includes milk. Clear fluids until 2 hours before surgery and can continue, and the patient can have sips of water for the 2 hours leading up to surgery. This entails 30mLs of water per hour until the time of surgery.

A 200ml Fresubin Energy Fibre drink (300kcal / 11.2g pr/36g CHO) drink is supplied to non-diabetic patients at POA, to consume 6 hours before surgery. Practically, this means patients being admitted at 7am will drink this last thing before going to bed the night before & those being admitted at 11am should have it at 6am. Local advice from NNUH endocrinologists is not to give carbohydrate loading to patients with diabetes.

3.7. Pre-op Antihypertensives

Stop ACEi/A2RB inhibitors 24 hours before surgery to reduce the chance of peri-operative hypotension.

3.8. Theatre

A World Health Organisation (WHO) team brief at the start of the list should be done so that the team is familiar, and any early issues identified and dealt with. Routine WHO sign in, time out and sign out checklists are carried out. To promote efficiency and faster turnaround, it is recommended that one of the assistants (SCPs/Registrars) is scrubbing in advance, while the patient is being positioned allowing for the skin prep and draping procedure to commence promptly.

Post-op radiology imaging and any necessary post-op bloods are to be requested by the practitioners, indicating the expected date of discharge to facilitate timely discharge, particularly for day case patients.

3.9. Anaesthetic technique

In Theatre			
Anaesthesia	Single shot spinal +/- target controlled infusion for sedation (OR a light GA if spinal not possible)	**Theatre time <90 minutes** Prilocaine 2% hyperbaric 3ml (knee) 3.5ml (hip) **Theatre time 90-160 mins** Bupivicaine 0.25% 3.5-4.5mls **Theatre time >160 minutes or complex case** Bupivacaine 0.5% 2.5-3ml No opiates in the spinal	
Regional Technique (block or LA choice may be modified at discretion and expertise of anaesthetist)	TKR	**Distal femoral canal / Adductor canal block** with cutaneous nerves: 10-20mls 0.25% levobupivicaine +/- IPACK: 10-20mls 0.25% levobupivicaine (an alternative is posterior infiltration by surgeon) +/- genicular nerves and cutaneous branches (or infiltration by surgeon)	
	THR	+/-PENG block: 20mls LA low concentration (eg 0.25% levo or 0.2% ropi) +/- Lateral cutaneous nerve of thigh: 3-5mls LA	
Local Infiltration	Infiltrate with remaining safe volume of 0.2% ropivacaine at end of operation (calculated after blocks have been performed). (3mg/kg max dose for ropivacaine, 2mg/kg for bupivacaine, 2.5mg/kg for levobupivacaine)		
Anti-eme tics	Ondansetron	4 mg IV	
	Dexamethason e	9.9mg IV	Consider reduction the dose and monitoring hourly CBG in patients with diabetes.
Pain relief	Diclofenac	75 mg IV	Consider contra-indications and cautions for use
Antifibrinolyti c	Tranexamic acid	1g iv to minimise blood loss	Half-life is 120 minutes so give just before tourniquet goes down for TKR and just after incision is made for THR (consider withholding if PMHx of VTE)
Additional instructions	Antibiotics as per local guidance. Avoid urinary catheter.		

Fluids	Limit intra-operative fluids to reduce risk of post-operative hyponatraemia and urinary retention (aim max 1l).

3.10. TKR Local Infiltration technique (Appendix 2 for additional information)

The aim of this process is to target the nerves supplying pain fibres to the knee capsule & a systematic, considered technique is required. Ropivacaine 0.2% is used (1.5mL/Kg of ideal body weight, including any used in anaesthetic blocks). The injection is made in two stages. The first injection is done after the bone surfaces have been prepared, but before the components have been inserted, since access to the posterior capsule is limited once the components are in place.

In the first set of injections, Ropivacaine 0.2% is injected to a depth of 5 -10 mm into the tissues around the posterior joint capsule, using a systematic sequence from medial to lateral to ensure uniform delivery to these tissues. Care is taken to avoid the midline neurovascular structures & to aspirate prior to injecting. Further volume is injected onto the anterior surface of the femur / superior capsule, into the deep tissues around the medial and lateral femoral epicondyles and into the vastus medialis and medial soft tissue release.

The second set of injections is performed after closure of the quadriceps & medial release & includes injections into the subcutaneous tissue. The needle is inserted parallel to the wound edge to a depth of about 25 mm and injection is done as the needle is withdrawn. Finally, if available 10-20mL of ropivacaine is injected into the joint once the quadriceps and joint capsule have been closed.

The surgeon may insert a catheter in the knee for post-operative infusion of 0.2% Ropivacaine at 8ml/h for 24h, although this is no longer frequently utilised. If this is the case, it is best to wait at least 4 hours before infusing unless the dose of LA has been low enough to allow the infusion to be started earlier. A discussion would need to occur with the anaesthetist prior to starting so that calculations could be made about the dose of 0.2% ropivacaine given so far.

3.11. THR Local Infiltration technique

Ropivacaine 0.2% is injected in stages (1.5mL/Kg of ideal body weight, including any used in anaesthetic blocks). The first injection is made after insertion of the components, the second one after closure of the deep fascia. The first injection of is made into the tissues around the rim of the acetabulum, focusing on the joint capsule, anteriorly, posteriorly and inferiorly and around the exposed gluteal muscles.

The second injection of is made into the fascia lata and IT band, followed by subcutaneous infiltration, with the needle inserted parallel to the edge of the wound to a depth of about 25 mm and injection done as the needle is withdrawn. If available. 10-20mL is reserved for infiltration around the ASIS, through the wound, to achieve a lateral cutaneous nerve block.

3.12. NERP post-op medication guide

NERP protocol medications			
	Medication	**Dose / route**	**Other considerations**
Pain relief	Paracetamol	1g QDS PO/IV	If patient less than 50kg - Give 500mg QDS PO
	Ibuprofen with lansoprazole	400mg TDS 15mg OD	Unless contra-indicated. First dose of ibuprofen 12h after diclofenac.
	Oxycodone modified release (MR)	10mg BD PO for 2 doses post op (8pm and 8am)	Dose ↓ to 5mg BD if age >80 years or CrCl < 30mL/min, or if <50kg If CrCL < 15mL/min consider immediate release liquid at low dose i.e. 1.25mg QDS plus PRN.
	Morphine sulphate 10mg/5mL liquid (Oramorph® 10mg/5mL)	5-10mg 2 hourly when required PO**	Dose if age >80years 5mg 2 hourly OR if CrCl < 20mL/min 2.5-5mg 4 hourly (If not tolerated consider Oxycodone 5mg/5mL Liquid can be prescribed as alternative to morphine liquid – *N.B. twice as potent therefore half the dose is required*)
	Review pain Day 1 post op: *aim to step down after 2 doses of oxycodone (If patient not controlled, consider further dose up to 3 additional doses of oxycodone MR – this may be needed for TKRs)*		
	Step down option 1 Dihydrocodeine	30mg QDS PO	Caution in patients already prescribed opiates or have intolerance or allergies to opiates First dose 12h after last oxycodone.
	Step down option 2 Morphine liquid 10mg/5mL	2.5-5mg QDS PO	
Laxatives	Lactulose	15ml BD PO	Avoid if history of diverticulitis and prescribe Laxido® as alternative. Can also use patients' normal laxative as alternative.
	Senna	2 tablets ON PO	Avoid in patients with a history of diverticulitis
	Glyceryl Suppositories	8g rectal as required	
Anti-emetics	Cyclizine	50mg 8 hourly PO	PRN med
	Ondansetron	4mg 8 hourly PO / IV / IM	PRN, Caution in patients at risk of prolonged QT interval
** If pain not well controlled and patient tolerating morphine liquid the dose can be increased to 10-20mg 2hourly			

Take note of allergies, regular medications and specific contraindications

- Avoid modified release oxycodone if regular medications include more than simple opioids (i.e., already on a regular dose of slow-release morphine or fentanyl patch or buprenorphine patch with strength > 35 microgram/hr) – discuss with anaesthetist or orthopaedic pharmacist regarding post-operative pain regimen.
- Patients on an established dose of tramadol should be managed individually and potentially have this continued alongside the NERP regime of oxycodone MR. This is to minimise the risk of serotonergic withdrawal.
- Modified release opioids should be avoided in patients with obstructive sleep apnoea. Consider immediate release as an alternative. Patients with OSA may not be suitable for day case.

3.13. Post-op care

- IV fluids taken down in recovery
- A 200ml Fresubin Energy Fibre drink (300kcal / 11.2g pr/36g CHO) drink is given to the patient on return to the ward. Do not give carbohydrate loading in patients with diabetes.
- NEWS(2) score performed on arrival in recovery, on return to ward, 30 minutes after return to ward, hourly for 4 hours, 2 hourly for 2 hours, 4 hourly for 2 hrs and then 4 -6 hourly thereafter. If at **any point** a patient triggers on the NEWS2 score that the NEWS2 policy is followed and observation frequency is adjusted accordingly.
- VAS pain score performed with NEWS (2) scores
- Regular assessment of regression of spinal block & mobilization within 1 hour of offset
- Encourage patient to eat & drink & dress in “home clothes”
- Avoid indwelling urinary catheter – “in-out” catheter if necessary
- Aggressive management of vomiting or nausea symptoms
- Regular analgesia
- Check X-ray – on day of surgery for patients targeted for Day 0 discharge (after physiotherapy mobilization). All other patients should have X-ray as early as possible on first post-operative day to enable discharge on Day 1.
- Dexamethasone oral 12mg, 48h after initial dose, may be given as a TTO, if specified by anaesthetist / surgeon. This should not be given in patients living with diabetes.

3.14. Post-operative bloods

- NANOC: Hemocue prior to discharge, with formal U&E sent only for those specifically instructed to have them by anaesthetist or surgeon, patients ASA > 3 , or those with pre-operative K+ <3.7mmol/L or eGFR <60 mL/min/1/73m2
- Formal FBC if clinically indicated or Hemocue <100g/L.
- NNUH main site elective ward: FBC & U&E to be sent on morning Day 1 post-op.

3.15. Regression of Spinal Block

- Patients should be considered as safe to mobilise once the spinal block has worn off.
- This means that they should have normal power of foot dorsiflexion & normal sensibility in the foot.
- Hips should also have the ability to contract their quadriceps.
- Patients with an adductor canal block (knees) will lose 30% of quadriceps strength for 8-12 hours.

3.16. Urinary Retention (see appendix 3)

- Patients unable to void urine should have their bladder scanned to assess if they are in urinary retention.
- Encourage the patient to mobilise to the toilet rather than using a bottle or bed pan.
- If a patient is unable to void & has a residual volume of > 500mls, an “in-out” catheterisation should be performed to drain the bladder.
- Urine output should then be carefully monitored to ensure that the patient is successfully voiding before discharge.
- If a patient goes back into urinary retention & is unable to void, an indwelling urinary catheter should be inserted. This should not delay discharge & the patient can go home with the catheter in situ, with arrangements made for a community Trial Without Catheter (TWOC) at 2 weeks.

3.17. Hip Precautions

For patients who have had a spinal anaesthetic, a Charnley wedge should be considered, at the surgeon’s discretion, until the effects of the spinal have worn off. After this point they are no longer necessary.

No routine hip precautions are otherwise necessary. (Tetreault et al 2020, Crompton et al 2020) The patient can sleep on either side if they wish, with a pillow between their knees if this helps with pain. They can sit on a chair of adult size and height and do not need raised chairs or toilet seats.

The aim is to keep the patient in a comfortable range of movement. They should be advised to avoid excessive hip flexion (>90 degrees) and rotation for the first six weeks after surgery. The simple advice of “do not cross your legs when sitting or lying” is often easiest to follow.

3.18. Physiotherapy and Mobilisation

The most important aspect of Enhanced Recovery is to enable patients to independently perform routine activities as early as possible.
Rehabilitation should include:

- Advice on managing activities of daily living.

- Home exercise programmes.
- Mobilisation for people who have had knee or hip replacement.

An initial physiotherapy assessment will take place within 1 hour of the spinal motor block wearing off.

Nursing staff should have competency in day 0 mobilisation, including first mobilisation.

On the first postoperative day and thereafter, if a patient feels dizzy, ensure that their Hb is > 80g/dL and medications reviewed as these can also cause dizziness.

Patients will be encouraged to remain out of bed as much as possible, dressed in their own day clothes where practical, to highlight the fact that they are in their rehabilitation/discharge phase.

Patients will be encouraged to participate and undertake their exercise programme as prescribed by the physiotherapy team.

Patients will mobilise with support from the ward team at least twice on the day of surgery with the aim to achieve independent mobility for toileting needs. Once the therapy team assess that the patient is stable with their walking aid or crutches without physical support, they will be encouraged to mobilise independently with aids on the ward as appropriate. Patients will be assessed functionally to ensure they can manage bed/ toilet transfers and steps or stairs if required.

Patients who are not discharged on the day of surgery- day 0 (within 24h) will be reviewed at least twice daily by the Physiotherapy team to ensure progression and to achieve criteria/goals for discharge. Some patients may achieve these after one physiotherapy session.

Intervention will include advice and education on self-directed rehabilitation providing a clear understanding of their rehab goals, pain and oedema management, prescription of exercises to optimise range of movement, strength and balance and the importance of independently completing their prescribed exercises to achieve these goals, gait re-education, integration of mobility into functional tasks and arrangements for appropriate follow up care after discharge in conjunction with the wider multidisciplinary team (MDT).

3.19. Thromboprophylaxis

	Indication	Medication (LMWH* = Standard dose)	*Duration (post procedure)*
Knee replacement surgery (TKR / Revision TKR)	No contra-indication to aspirin	Aspirin 150mg dispersible tablets od (plus PPI cover)	14 days**
	Patients on clopidogrel – *stop clopidogrel and give*	Aspirin 150mg dispersible tablets od (plus PPI cover, then restart clopidogrel when aspirin course complete)	14 days**
	With previous peptic ulceration history or Barrett's Oesophagitis or other contra-indications to aspirin	LMWH	14 days**
Hip replacement surgery. (THR / Revision THR)	No contra-indication to rivaroxaban	LMWH at 10pm on night of operation then rivaroxaban 10mg od	35 days**
	Patients on clopidogrel (restart when wound stable post operation)	LMWH	28 days**
	Rivaroxaban contraindicated (Rivaroxaban contraindicated in eGFR <15ml/min, caution if eGFR 15-29 ml/min)	LMWH	28 days**
*If using LMWH VTE prophylaxis for people less than 50kg, or over 100kg, or with renal impairment, see Dosing Advice Sheet LMWH for guidance on dose adjustment: Trustdocs Id: 1697. For fondaparinux see drug summary of product characteristics (SmPC) **Subtract days of post-op Dalteparin or Rivaroxaban given in the hospital from total quantity			
For patients already prescribed DOACs/Warfarin please follow the trust guidelines Clinical Guideline for: Management of Adult Patients on Therapeutic Anticoagulation who Require Elective Surgery or an Invasive Procedure Trust ID 1215.			

Mechanical thromboprophylaxis:- from Trust Docs ID 12096

Patients admitted for a procedure under GA or regional anaesthesia should be given correctly fitted anti-embolism stockings to wear on admission unless contraindicated until they are normally mobile.

Pneumatic calf compression devices may be used peri-operatively as an alternative to anti-embolism stockings, but not in addition.

3.20. Discharge

If appropriate, discharge on the day of surgery will be routinely targeted, particularly for the first and second patients on each list. The majority of patients will be able to go home on day 1 post-operatively, and allowing for some patients with greater needs, who may stay longer, an overall median LoS of 2 days achieved.

Discharge medication
Analgesia is provided for 2 weeks post-operatively.

Analgesia	• Paracetamol 1g QDS for 14/7 • Ibuprofen 400mg TDS for 7/7(unless contraindicated) • Dihydrocodeine 30mg QDS for 5/7 after cessation of oxycodone MR • Oramorph 10mg/5mL 2.5-5ml liquid every 4 hours for strong acute pain.
Laxatives	• Lactulose 15mls BD for 7/7 • Senna 2 tablets ON
Thromboprophylaxis	• As per thromboprophylaxis protocol above
PPI	• Lansoprazole 15mg OD - If taking NSAIDs or aspirin
Anti-emetics	• Ondansetron 4mg TDS/ cyclizine 50mg TDS PRN while on Oramorph or Dihydrocodeine (5/7) • A single dose of dexamethasone oral 12mg 48h after initial dose, can be given as a TTO if specified by anaesthetist or surgeon. this is in conjunction with a PPI

3.21. Nurse / ONP led discharge criteria:

See appendix 4 for Criteria Led Discharge Checklist

- Patient ambulant with walking aids to standard compatible with discharge, safe transfers, stairs (if required at home)
- Able to drink & tolerate oral fluids
- Pain controlled on oral analgaesia
- Voiding urine without catheter
- Wound dry

- Post-operative X-ray performed & reviewed by surgical team or ONP signed off as competent at X-ray assessment
- Those patients with urinary catheter can still be discharge with community TWOC as per above recommendations

Post-operative bloods satisfactory. If Hb <100g/L, clinical review by surgical team indicated to exclude ongoing bleeding or evolving haematoma. Therapy equipment in place if needed. Physiotherapy, Occupational Therapy and patient individual goals achieved. Referrals to Therapy Outpatients services, Community services and Social Services completed as appropriate. Surgical, wound and therapy follow-ups in place. TTO in place including VTE prophylaxis. Safe place of discharge (if day case surgery, must not live alone & must have access to telephone). A point of contact is provided for advice and support if required following discharge: ward telephone number & OPAL number.

3.22. Follow-up

A routine Nurse Practitioner Follow Up telephone call will be made at 24 hours after discharge for patients discharged within 24 hours of surgery.

Wound oozing should have ceased by 72hrs. Patients should be advised that the dressing should not be changed or disturbed unless leaking or soaked through. Patients should be provided with a clear single point of contact if they have concerns in the post-operative period (Orthopaedic Practitioner Advice Line – OPAL **01603 287795**).

Suture / clip removal or wound review should be in NANOC wound clinic or at the GP surgery with Practice Nurse at 12-14 days post-operative,
Follow up should be at 6 weeks post-operative and if there are no clinical concerns, the patient is making expected progress and has an ODEP 10A* (or better) implant, they can be discharged. If this is not the case, follow-up at consultant's discretion.

If there is any clinical concern or the case was complex, then further follow up may be made at 1 year or an earlier interval as required.

For implants with a <10A* rating further surveillance may be required as recommended by "Beyond Compliance".

Individualised outpatient rehabilitation should be offered to people who have ongoing functional impairment leading to specific rehabilitation needs.

4. Related Documents

A Standard Operating tool for: Health Screening Tool for Orthopaedic Procedures – Trust Doc ID: 20578

Dosing Advice Sheet LMWH – Trust Doc ID: 1697

Adult patients on therapeutic anticoagulation who require elective surgery or an invasive procedure – Trust Doc ID: 1215

Trust Clinical Guideline for the Prevention of Venous Thromboembolism (VTE) for Adult Surgical Patients 16 years and over – Trust Doc ID: 12096

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6. Audit of the service to be delivered

Compliance with the process will be monitored through the following:

Key elements	Process for Monitoring	By Whom (Individual / group /committee)	Responsible Governance Committee /dept	Frequency of monitoring
Length of stay	Power Bi calculator	NERP MDT meeting	T&O	Monthly
Complications	Self reporting at governance meetings	Consultants / Trainees	T&O	Monthly

The audit results are to be discussed at relevant NERP MDT and governance meetings to review the results and recommendations for further action.

7. Appendices

7.1. Appendix 1 - Online resources for Orthopaedic Patients awaiting surgery

Active Norfolk

On this page you can find top tips for keeping yourself healthy through physical activity, as well as more specific information about how it can be used to manage and improve some long term health conditions.
https://www.activenorfolk.org/your-health

Arthritis Action Website

Arthritis Action is a UK charity giving hands-on, practical help to improve the quality of life of people affected by arthritis. They offer an integrated self-management approach, which looks at both the physical and mental health impact of living with arthritis. They support people living with musculoskeletal conditions through healthy eating advice, mental health resources, pain management techniques, local groups, and exercise advice and resources
www.arthritisaction.org.uk

Getting as fit as possible for surgery

In the run up to your surgery, there are things you can do to get ready and this will also help you make a better recovery. The same things that will help you get fit for surgery will also help you if you ever catch COVID-19 and so now is a good time to do these things.

Below are some health topics that can really make a difference. Even making these changes just 6 weeks before your operation can be a real help but these are changes that could help you for the rest of your life.

Smoking

It is in your best interests to stop smoking as soon as possible, especially before surgery. This will reduce the risk of any breathing problems during and after surgery.
https://www.nhs.uk/conditions/stop-smoking-treatments/

Alcohol

Drinking too much alcohol may slow your recovery and also make it more likely that you get an infection. Men and women are advised not to drink more than 14 units of alcohol a week, and we ask our patients to try to keep to these limits. If you would like more information, please visit these webpages:
https://www.nhs.uk/oneyou/for-your-body/drink-less/
https://www.nhs.uk/conditions/alcohol-misuse/

Diet

Eating a healthy diet will improve wound healing and reduce muscle weakness and tiredness during your recovery. A good diet will also help you fight infection.
https://www.nhs.uk/live-well/eat-well/

Obesity and weight loss

Trying to lose weight can be difficult, yet the best way to help tackle this is to eat a healthy calorie-reduced diet and exercise regularly. Even losing a small amount of weight before surgery will help. Set yourself a goal that you can make.
https://www.nhs.uk/conditions/obesity/

Physical activity – moderate level

We should all take some form of moderate exercise every day, although we appreciate that this can be difficult for patients with arthritic conditions. Exercise will make you stronger, reduce breathing issues and build up stamina. These will all help you get better more quickly.
https://www.nhs.uk/live-well/exercise/
https://www.nhs.uk/better-health/

Diabetes

If you have diabetes, we ask that you try to keep your sugar levels within the limits as agreed with your doctor or nurse. Poorly controlled diabetes can be a serious concern during surgery. Please don't hesitate to talk to your clinical team in the weeks leading to your surgery if you are concerned. We recognise things may not be perfect but taking steps to reduce the risks is all we can ask our patients to do.
https://www.nhs.uk/conditions/diabetes/

Mental health and wellbeing

Many patients face concerns and anxieties before going into hospital, or mentally dealing with an ongoing condition or illness. There are many resources that can help to prepare yourself mentally.
https://www.nhs.uk/conditions/stress-anxiety-depression/improve-mental-wellbeing/

Managing pain

Many patients get aches and pains in their muscle and joints. This resource will help you to manage these.
https://www.csp.org.uk/conditions/managing-pain-home

Further information

If you require any support for patients with learning disabilities or learning difficulties prior to surgery or treatment, please see the link below for information.
https://www.nhs.uk/conditions/learning-disabilities/

7.2. Appendix 2 - Information for Nurses and Junior Doctors looking after patients with Local Anaesthetic Infusions (LAI) for knee replacements as part of the Enhanced Recovery Programme

If your patient has had a catheter inserted into their joint by the surgeon. He/she has had 150-200 mls of 0.2% Ropivacaine injected around the joint at the time of surgery and for TKRs we are infusing 8 mls/hour of Ropivacaine 0.2% via the wound infusion catheter for 24 hours postoperatively.

Some patients may require a top-up bolus of local anaesthetic solution last thing at night or in the morning before physiotherapy. (Some may require a top-up bolus in recovery. If this is the case call the patients anaesthetist) The Bodyguard Pain Manager pump pump is programmed so that 2 or 3 post-operative boluses can be given by an anaesthetist. If you feel your patient needs a bolus, please inform the enhanced recovery sister on bleep ****, in working hours, or the anaesthetic registrar on 0900 at night.

Potential Hazards:

Wound catheter migrating

Please check to see if the wound catheter has been properly secured. It should be under a transparent adhesive dressing.

Local Anaesthetic toxicity

All the published studies suggest that local anaesthetic toxicity is very unlikely to occur It is no more likely with epidural infusions.

However, the signs of local anaesthetic toxicity are:

- Numbness and tingling around the mouth.
- Confusion / vagueness / restlessness.
- Twitching.

If any of the above signs occur - stop the infusion **immediately** and contact the anaesthetist.

Monitor NIBP, oxygen saturation and heart rate.

If cardiac arrest occurs commence CPR drill.

Ensure that intralipid is available on the cardiac arrest trolley as this is a specific antidote to local anaesthetic toxicity.

7.3. Appendix 3 - Management of postoperative urinary retention with in/out urinary catheterisation

Postoperative urinary retention is the inability to pass urine after a surgical procedure despite having a full bladder. It is a relatively common complication after surgical procedures due to anaesthesia, opioids, pain, immobility and the physiologic changes of surgery. It can be reversible with minimal interventions, or if unnoticed it can have lasting effects on the patient. Therefore, the ability to recognise and manage postoperative urinary retention is essential for any healthcare professional responsible for the patient care (Pomajzl & Siref, 2023).
The GIRFT guidance is to avoid routine urinary catheterisation and use in/out catheterisation for relieving urinary retention postoperatively.

The management of postoperative urinary retention with in/out urinary catheter should follow the bellow protocol:

- Encourage patients to mobilise to the toilet rather than using bed pans/urinary bottles (the bladder is emptied most effectively while sitting or standing);
- If patient is not able to urinate or is symptomatic (suprapubic pain or discomfort, bladder spasm, and/or urine leaking) then use a bladder scanner to determine urine volume. If the urine volume is >500ml, encourage patient again to try to pass urine in the bathroom.
- If unable to, insert in-out catheter with appropriate aseptic precautions (see Trust Guideline for the Use and Care of Urethral and Suprapubic Catheters in Adults).
- Keep catheter until the amount determined by bladder scanner was drained and then remove it. A fluid balance chart must be started and the residual volume must be recorded. Urine output should be closely monitored and recorded to ensure patient is passing urine successfully.
- Make sure the pain is addressed after the in/out catheter is undertaken as there is clear evidence of the link between post operative pain and Postoperative urinary retention;
- If the patient is subsequently unable to pass urine and a repeat bladder scanner shows >500mls urine, indwelling urinary catheterisation is required with appropriate aseptic precautions (see Trust Guideline for the Use and Care of Urethral and Suprapubic Catheters in Adults). The patient can be discharged with the indwelling catheter.
- Urinary catheter teaching is required prior to discharge and the patient should be discharged with a leg bag attached to the catheter to facilitate mobility and a catheter pack;
- District nurse referral should be made for TWOC in 2 weeks in the community.
- This information should be written in the discharge letter with the recommendation for the GP to consider referring the patient to Urology if fails TWOC in 2 weeks.
- If the patient urinates after the in/out catheter and is discharged, this will be followed up in the wellbeing call.

7.4. Appendix 4- Criteria Led Discharge sheet

Criteria Led Discharge
Joint Arthroplasty (THR/TKR/UKR)

Patient Sticker

Requirement	Yes	No	N/A	Notes
Operation Note states patient is suitable for Criteria Led Discharge	☐	☐	☐	
NEWS 0	☐	☐	☐	
Pain controlled on Oral Analgesia	☐	☐	☐	
Tolerating food and drink	☐	☐	☐	
Voiding urine without catheter.	☐	☐	☐	
Wound Dry	☐	☐	☐	
Post-operative X-ray performed and reviewed by surgical team or practitioner signed off as competent at X-ray interpretation	☐	☐	☐	
Post operative Hb >100	☐	☐	☐	
Patient ambulant with walking aids to standard compatible with discharge, safe transfers,stairs (if required at home)	☐	☐	☐	
Referrals to Therapy Outpatients services, Community services and Social Services completed if appropriate	☐	☐	☐	
Therapy equipment in place if needed.	☐	☐	☐	
Therapy follow-ups in place	☐	☐	☐	
OPAL number provided	☐	☐	☐	
TTOs complete for dispensing as protocol	☐	☐	☐	

All checklist requirements met?	☐ Yes – continue with MFD ☐ No – request medical review
Medical/Practitioner Review (to be completed if checklist requirements not met)	
Continue with MFD?	☐ Yes ☐ No – document forward plan in patient notes

Name Doctor or Practitioner completing review		Signature	
Date of review (dd/mm/yyyy)		Time of review (24-hour clock)	

Name of discharging Nurse (print)		Signature	
Date of discharge (dd/mm/yyyy)		Time of discharge (24-hour clock)	

8. Equality Impact Assessment (EIA)

Type of function or policy	New

Division	Surgery	**Department**	Trauma and Orthopaedics
Name of person completing form	Amresh Singh	**Date**	23/5/25

Equality Area	Potential Negative Impact	Impact Positive Impact	Which groups are affected	Full Impact Assessment Required YES/NO
Race	N/A	N/A		No
Pregnancy & Maternity	N/A	N/A		No
Disability	N/A	N/A		No
Religion and beliefs	N/A	N/A		No
Sex	N/A	N/A		No
Gender reassignment	N/A	N/A		No
Sexual Orientation	N/A	N/A		No
Age	N/A	N/A		No
Marriage & Civil Partnership	N/A	N/A		No
EDS2 – How does this change impact the Equality and Diversity Strategic plan (contact HR or see EDS2 plan)?		No impact		

- **A full assessment will only be required if: The impact is potentially discriminatory under the general equality duty**
- **Any groups of patients/staff/visitors or communities could be potentially disadvantaged by the policy or function/service**
- **The policy or function/service is assessed to be of high significance**

IF IN DOUBT A FULL IMPACT ASSESSMENT FORM IS REQUIRED

The review of the existing policy re-affirms the rights of all groups and clarifies the individual, managerial and organisational responsibilities in line with statutory and best practice guidance.