

# Is day case hip and knee replacement surgery achievable in the NHS?

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Day case total hip replacement (THR) and total knee replacement (TKR) surgery is proven to be safe and effective across several different healthcare systems<sup>1</sup>, yet it is not commonly performed in the NHS. Continuing improvements in enhanced recovery protocols have led to significant reductions in length of stay to the point where patients can now be safely discharged on the day of surgery. Advantages may include greater patient satisfaction, reduced cost, improved operational efficiency and lower demand on inpatient beds. In this article, we review the evidence and present the results of our first hundred day case THR and TKR procedures.

## Definition

The definition of 'day case' surgery varies across the literature and its terminology appears to have evolved over time. 'Inpatient' surgery typically involves a patient staying at least one night in hospital whilst the term 'day case' usually implies admission and discharge on the same calendar day. However, the term 'outpatient' surgery has also been applied and may be misleading as in some reports, these patients stay in hospital overnight but for less than 24 hours.<sup>2</sup> More recently there has been a shift towards reporting on genuine 'day case' surgery where patients are discharged on the same day as their surgery, often in ambulatory care settings.<sup>3</sup> It is therefore important for researchers to accurately quantify their length of stay in hours and minutes and equally for the reader to be alert to these discrepancies. This article focuses on day case patients admitted and discharged on the same calendar day.

## Literature review

Much of the published literature originates from USA where it is estimated that there will be a 77% growth in day case THR and TKR surgery over the next ten years.<sup>4</sup> This is largely due to the introduction of bundled payment systems which provide financial incentives for hospital providers to reduce costs associated with length of stay. There is also a high prevalence of cementless implants in the USA and a drive towards the use of minimally invasive hip approaches, such as the direct anterior approach, but these factors remain unproven in facilitating early discharge.<sup>5</sup>

The advantages of day case THR and TKR surgery are well reported and include greater patient satisfaction<sup>3</sup> and reduced costs of approximately 30% associated with the inpatient episode.<sup>6,7</sup> This may have important benefits for NHS patients where there is



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an increasing focus on reducing length of stay, improving financial sustainability and relieving pressure on inpatient beds, particularly during winter pressures. Concerns about the safety of same day discharge are understandable but a review of the literature reports a similar, if not better, safety profile for day case compared to inpatient surgery when investigating readmission and complication rates.<sup>1</sup> This is unsurprising given that well-implemented enhanced recovery protocols are known to decrease the risk of medical complications such as cardiopulmonary and thromboembolic events.<sup>8</sup> Risk factors for failure of same day discharge include significant medical comorbidity, performing surgery late in the day, inadequate pain control, dizziness, general weakness, nausea and sedation.<sup>9</sup> This highlights the need for careful patient selection, thorough preoperative medical evaluation and established regimens for analgesia, antiemetics and rehabilitation.

### The Northumbria approach

Over the past 11 years, we have refined our enhanced recovery protocol to allow early mobilisation, effective analgesia and same day discharge for primary THR and TKR. A standardised protocol for all THR and TKR patients has been developed with our surgical, anaesthetic and rehabilitation teams (Table 1). This is the same protocol for both preselected day case patients and routine inpatients with no difference in anaesthetic techniques, surgical approaches, implant choice, analgesic regimens and postoperative mobilisation. Selection criteria for day case surgery include satisfactory general health and uncomplicated surgery but mainly a desire to return home on the evening of surgery. Stable chronic medical conditions are not a barrier to same day discharge.

Patients who wish to undergo day case surgery are counselled appropriately and are usually listed either first or second on a morning list to allow time for assessment and rehabilitation on an inpatient ward. There is no difference in our rehabilitation protocol for day case patients with no additional physiotherapy or nursing input at home. In other words, this does not use a 'hospital at home' model. Physiotherapy assessment begins approximately two hours after the patient has returned from recovery and involves mobilisation with a walking aid, range of movement exercises, strengthening exercises, transfer practice and stairs assessment, if required. Patients are dressed in normal clothes rather than pyjamas and achieve independent mobility for toileting. Routine hip precautions are no longer used and instead, we encourage patients to use their limbs normally but not to force their joint into extreme positions. Discharge criteria are listed in Table 2. >>

<b>Before admission</b>	Patient education and counselling
	Comprehensive preassessment
	Anaemia screening and optimisation
	Other screening tests (HbA1c, CRP, thyroid, albumin)
	MSSA and MRSA screening
<b>Anaesthesia</b>	Ring fenced wards
	Staggered admissions
	Minimise fasting
	Carbohydrate loading
	Patient pre-warming
	Low dose spinal anaesthetic (no opiates)
	No neuraxial blocks
	Prophylactic antiemetic agents
	Streamed music with specific artist as per patient preference
	Intravenous tranexamic acid
<b>Surgery</b>	Chlorhexidine prewash
	Double prep with alcoholic povidone-iodine (10%) and chlorhexidine (2%)
	Assisted gloving
	Standardised implant inventory for THR and TKR
	No drains
	Preservation of patellar fat pad
	No patellar resurfacing
	Povidone-iodine wound lavage
	Topical tranexamic acid
	Triple skin closure (subcuticular absorbable monofilament, skin clips, glue)
Aquacel™ surgical dressing	
<b>Discharge and follow-up</b>	Ward discharge criteria
	Discharge at 6 week follow-up appointment

Table 1: Enhanced recovery protocol

Reasonably pain free on regular analgesia
Voiding urine without a catheter
Satisfactory postoperative blood tests (full blood count, urea and electrolytes)
Independently mobile with an appropriate aid
Able to negotiate steps or stairs safely (if required)

Table 2: Discharge criteria

Patients	97
Follow-up (mean)	0.21 yrs (0.12 to 0.53)
Length of stay (mean)	11hrs 32min (8hrs 21min to 14hrs 37min)
Age (mean)	63.1 yrs (25.7 to 82.5)
Male	55 (55%)
Joint replacements	100 (6 staged bilateral)
THR	57 (57%)
Cemented	45 (78.9%)
Hybrid	12 (21.1%)
TKR	43 (42.2%)
Right sided	51 (51%)
THR approach	Prophylactic antiemetic agents
Posterior	48 (84.2%)
Lateral	9 (15.8%)
TKR approach	
Medial parapatellar	39 (90.7%)
Midvastus	4 (9.3%)
Surgeon grade	
Consultant	78 (78%)
Trainee	22 (22%)
ASA score (mean)	1.7 (1 to 3)
ASA 1	33 (33%)
ASA 2	64 (64%)
ASA 3	3 (3%)
BMI (mean)	29.7 (19.5 to 46.6)
Length of surgery (mean)	65.7 mins (31 to 156)

Table 3: Patient demographics

Comorbidity	Cases (%)
Hypertension	32
Atrial fibrillation	1
Ischaemic heart disease	5
Hyperthyroidism	10
Hypothyroidism	1
Diabetes mellitus	11
COPD	6
Hypercholesterolaemia	9
Smoker	3

Table 4: Comorbidities

Patients are allowed home if they have achieved these goals. A pre-discharge x-ray is not a routine requirement unless there has been an intraoperative or postoperative concern. Patients are given a surgical helpline number to contact in case of any concern and are followed up with a telephone call at 2200 hrs on day of discharge and again at 0800 hrs the next day. TKR patients are referred for an outpatient physiotherapy appointment at two weeks. A surgical outpatient clinic appointment is made at six weeks for all patients and most are discharged at this point.

### Our experience

We studied the outcomes of THR and TKR surgery with same day discharge in a consecutive series of 97 patients (100 joint replacements) with a mean follow-up of 0.21 yrs (0.12 to 0.53). This included 57 THRs and 43 TKRs. Patient demographics and comorbidities are presented in Tables 3 and 4, respectively. Mean length of stay was 11 hrs 32 mins (8 hrs 21 mins to 14 hrs 37 mins). Our 30-day readmission rate for any cause was 3% (three cases) due to dislocation, pulmonary embolism and wound leakage. This last case had a negative joint aspiration and the wound healed without further intervention. No patients were acutely readmitted for pain, nausea or hypotension. This is compared to a readmission rate of 5.5% in an unselected concurrent cohort of inpatients undergoing THR or TKR surgery. Our surgical complication rate was 2% (two cases) including dislocation and knee stiffness. Both of these cases required further surgery. A dislocated THR required stem revision at the third postoperative day and a stiff TKR underwent successful manipulation under anaesthesia at six months postoperative. Mean postoperative Oxford scores were 40.5 (23 to 48) and 41.7 (25 to 48) points for hips

and knees, respectively. Mean Oxford score improvement was 24.4 (4 to 45) and 21.2 (12 to 32) points for hips and knees, respectively. This is compared to a national average improvement of 22.6 and 17.1 points for hips and knees, respectively. However, our day case patients are selected and therefore direct comparison of complications and outcomes should be interpreted with caution.

Our results indicate that day case THR and TKR surgery is feasible within the NHS. Our approach relies on the standardisation of anaesthetic and surgical techniques including low dose spinal anaesthesia, avoiding neuraxial blocks, using established (not minimally invasive) surgical approaches and only using implants with a proven track record. Our readmission rate was lower than our routine inpatient cohort and we observed a low complication rate. These are similar observations to other published results on well-established enhanced recovery protocols.<sup>10,11</sup> Our functional results are also higher than the national average as determined by Oxford score improvements.

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Challenges to the wide-scale implementation of day case THR and TKR surgery in the NHS largely relate to cultural and organisational issues. With an increasing body of evidence supporting same day discharge, it may only be a matter of time before its adoption into routine clinical practice. Further research will help clearly define its role within the NHS and this should focus on patient selection criteria, preoperative pathways, safety and education.

### Conclusion

This is the first report of day case THR and TKR surgery in the UK and it confirms that it is achievable within the NHS. Appropriate patient selection, standardised enhanced recovery protocols and dedicated rehabilitation teams are essential to success. ■

### References

References can be found online at [www.boa.ac.uk/publications/JTO](http://www.boa.ac.uk/publications/JTO).