Clinical Audit and effectiveness

Study of early mobilisation after elective arthroplasty

TOPRO

TOPRO Taurus

Walker with forearm support

made in Norway

Clinical Audit and Effectiveness

To evaluate the use of the Taurus walker following hip and knee arthroplasty in elective orthopaedics, promoting independence and confidence in early mobilisation.

Project Lead	Alexa Coyle
Project Team	– Quality Improvement Team MSEFT – Braintree Hospital – Broomfield Hospital – Basildon Hospital
Project Area	– Braintree Hospital, Courtauld Ward – Broomfield Hospital, John Ray Ward – Basildon Hospital, Horndon Ward
Report written by	Alexa Coyle
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Walker with forearm support

TOPRO Taurus

Clinical Audit and Effectiveness

This project was a Quality Improvement Initiative that adopted a PDSA (Plan-Do-Study-Act) process to establish the **effectiveness of the Taurus walker following hip and knee arthroplasty in elective orthopedics** across three sites (Braintree, Basildon, Broomfield) within one NHS Trust (Mid and South Essex Foundation Trust, MSEFT). The audit was planned and registered with the MSEFT Quality Improvement Team with agreed collaborative working between TOPRO UK and Mid and South Essex NHS Trust to trial the Taurus walker **to promote early mobilisation following elective arthroplasty**.

Introduction

The Taurus walker is a well-designed dynamic functional walker that is produced in Gjøvik, Norway and has been widely used in both the acute and community healthcare sectors in Norway for many years.

The Taurus walker has a unique design that enables the user to mobilise with a step through gait, enabling a normal gait pattern whilst offloading their lower limb weight through the forearms of the upper limbs. Currently in the UK, the conventional mobility aid that is widely used for the mobilisation of patients following elective hip and knee arthroplasty is the zimmer frame (3). The zimmer frame was patented in 1949 by William Cribbs-Robb of Stetford (1) and was designed to offer mechanical support and inherent stability whilst mobilising but does have its limitations with facilitating a normal step through gait pattern due to its static design.

By working collaboratively with TOPRO UK, MSEFT and with the support of the Academic Health and Science Network (AHSN) the Taurus walker was introduced to the elective orthopaedic wards as an alternative to the current mobility aid (a wheeled zimmer frame). The aim was to determine the effectiveness at promoting early mobilisation following elective hip and knee arthroplasty specifically looking at patient confidence to mobilise after surgery, engaging the wider multi-disciplinary team to be competent at getting patients up and mobile on the day of surgery and the overall affect on length of stay.

Background

In 2022, the National Joint Registry (12) report stated that during the three-year period between 2019-2022 there were 1,344,357 primary total hip replacements and 1,442,051 primary knee replacements undertaken in the UK. Nevertheless, during the covid-19 pandemic these services were severely affected and in March 2023, GIRFT (Getting It Right First Time) (2) reported that the National Health Service (NHS) elective surgery waiting list in England stood at over 6.5 million people.

Within these statistics the orthopaedic specialty, which includes hip and knee arthroplasty, not only had the highest number of patients but also the greatest volume of those waiting for longer than a year for treat-

ment. In contrast to this, the number of self-funded hip replacements rose by 184% between 2019-2022 according to the Private Health Information Network. The NHS constitution states that referral to treatment times should be within 18 weeks for non-urgent elective surgery and that no one should have to wait longer than this for treatment however, the patient claim line (13) report that as of the end of November 2022, only 59.6% of patients received treatment within the 18 week time limit therefore there were 40.4% of patients who had to wait longer than 18 weeks to receive treatment, many of whom were waiting for hip and knee replacements.

This challenge has been further compounded by the reduction in the number of NHS beds available for elective surgery (4), however the demand for hip and knee arthroplasty surgery has remained unchanged. This has demonstrated that the need for ring fenced elective orthopaedic beds with an effective, efficient delivery of a high volume, low complexity orthopaedic service is more critical than ever before.

Effective and efficient delivery of elective hip and knee arthroplasty has been well documented since the 1990s by Henrik Kehlet who pioneered the Enhanced Recovery After Surgery (ERAS) concept (6). Perioperative programmes which incorporate multimodal, evidence-based interventions have become known as fast-track or ERAS pathways.

Throughout the whole integrated care pathway of elective hip and knee arthroplasty there are recommendations which have been supported with evidence, for the purpose of this project the area of interest is the post operative period of when and who should start mobilising the patient. In 2020 a consensus statement produced by the ERAS society (5) strongly recommended that patients should be mobilised as early as they are able to, as this is said to facilitate early achievement of discharge criteria, thereby reducing the length of stay.

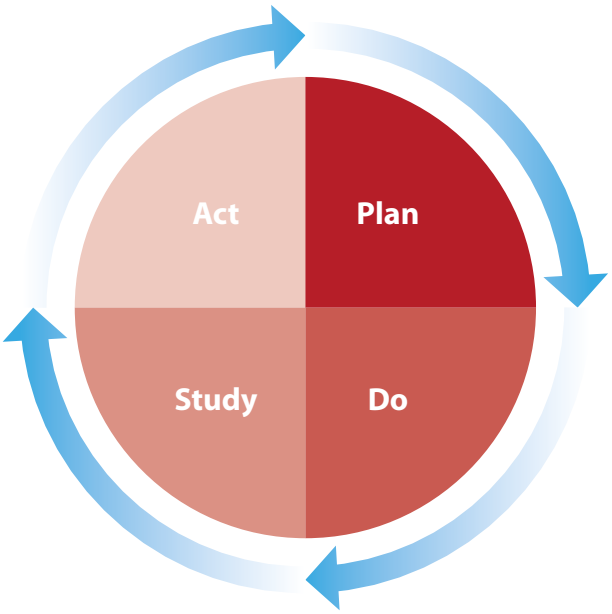
The evidence for this was considered 'strong' and suggested that the patients mobilise full weight bearing post op as early as 3 hours post op (4). There is ample evidence (9) that supports mobilising total knee arthroplasty patients on day 0 decreases length of stay with a meta-analysis showing a reduction in length of stay (by 1.8 days) when patients ambulate within 24 hours of surgery (6). Furthermore, if mobilised on the day of surgery (day 0) as opposed to day 1 this gave a significant difference in length of stay between day 0 and day 1 mobilisation at 2.44 vs. 2.80 days respectively (9) (10). One of the barriers to mobilising patients on the day of surgery has been cited as lack of extended hours by physiotherapists especially for those patients who arrived on the ward after 5pm (9). Specific protocols have been established where patients are mobilised on the day of surgery (10) and these have been advocated with clear educational instructions, written and verbal, for health care professionals (4) across the multi-disciplinary team (MDT) so that day 0 mobilisation can be achieved without the need to wait for the availability of physiotherapists.

Other barriers to post op mobilisation following hip and knee arthroplasty have been documented as the patient's fear of falling (8) where 42.2% of 204 patients reported a severe fear of falling when mobilising for the first-time following surgery. Additionally, just the anticipation of surgery alone led to anxiety and fear for patients (6) with just over half (56.5%) of 285 knee arthroplasty patients reported a fear of falling (7) . A further factor that has been alluded to is that older patients who have a fear of falling following surgery are because they are in severe pain and have difficulty mobilising (8).

However, as part of any ERAS pathway the key is to audit with continuous evaluation of component efficiency to ensure that optimal margins and best practice are constantly challenged (6).

Methodology

This project was a Quality Improvement Initiative, and the strategy was based on the driver diagram (appendix E) which then supported to structure each change idea using a **PDSA** (**Plan-Do-Study-Act**) approach, in which the data from the three metrics was closely reviewed.



The PDSA process was chosen to introduce and test the effectiveness of the Taurus walker in promoting early mobility and patient independence within the first 24 hours post hip and knee arthroplasty on a small scale prior to whole implementation, as this process is deemed the most effective method when a change of process is introduced with a specific, small sample size.

Plan

The project was completed across three elective orthopaedic wards on three separate geographical sites at Mid and South Essex Foundation Trust (MSEFT). MSEFT is one of the biggest NHS Trusts in the country, serving over 1.2 million people and this year Braintree Hospital had been successful in gaining GIRFT Elective Orthopaedic HVLC (high volume, low complexity) Hub Accreditation, specifically for the efficient delivery of hip and knee arthroplasty surgery.

Early mobilisation is essential for a successful enhanced recovery after surgery (ERAS) programme to ensure a reduced length of stay and high bed turnover. The presenting problems from a patient level were identified as reduced confidence to walk independently within 24 hours post op with the current walking aid (wheeled zimmer frame), from a service level, the physiotherapy working hours are between 08:00 - 16:00 hours and the current practice was that the patients had to wait for physiotherapists to mobilise them for the first time which could lead to a significant delay. This meant that at a system level there was reduced efficiency of the ERAS programme which contributed to an increased length of stay.

The aim of the project was to improve patient experience and reduce length of stay by trialling the Taurus Walker to mobilise patients following elective orthopaedic hip and knee arthroplasty within the first 24 hours post-surgery. To change the culture of early mobilisation responsibility by educating and encouraging all MDT staff on the ward to use the Taurus Walker as the preferred mobility aid within the first 24 hours and to promote patient independence and confidence. To establish what was the effect on length of stay in comparison to the length of stay for the same period in 2022 and if any subsequent cost savings were made.

Metrics

The three metrics to be measured throughout the trial were:

1. **Patient experience**
2. **Staff experience**
3. **Length of stay**

Do (material and methods)

The project conducted a 12-week trial on 3 separate elective orthopaedic wards across the MSEFT (Courtauld ward, Braintree. Horndon ward, Basildon. John Ray ward, Broomfield). TOPRO provided each site with 4 Taurus walkers on loan and delivered ward based training for all disciplines (nurses, health care assistants, therapy staff) on early mobilisation competencies and how to use the Taurus walkers as part of an education package. During the training sessions emphasis was placed on empowering all members of the multi-disciplinary team to mobilise the patients with the Taurus walker within 4 hours post-surgery and they were encouraged to mobilise patients to the toilet following surgery rather than use bedpans/commodes.

This implementation of change was a new concept for Basildon and Broomfield as the current ways of working meant that patients waited for physiotherapists prior to mobilising for the first-time following surgery. Braintree already had an established ERAS pathway that enabled nursing staff to transfer patients to either a chair or commode prior to being mobilised by the physiotherapist. There was an emphasis on empowering all members of the multi-disciplinary team to be confident in mobilising patients within 4 hours of elective arthroplasty surgery as part of enhanced recovery after surgery, promoting patient confidence and reducing overall length of stay. Pre-trial all staff from the multi-disciplinary team on the ward were asked to complete an anonymous survey as to when they feel confident to mobilise a patient and what would be their manual handling aid or mobility aid of choice (Appendix C). At the end of the trial the staff were asked the same questions for comparison and additional questions on their experience of using the Taurus walker (Appendix D).

All patients who were admitted to the respective elective orthopaedic wards following hip and knee arthroplasty were included in the sample. Surgical interventions included total hip arthroplasty (THA), total knee arthroplasty (TKA) or uni-compartmental knee arthroplasty (UKA). Patients had to remain on the ward throughout their hospital stay, any patients who were transferred for enhanced medical care needs were excluded from the trial. All patients were allocated a Taurus walker to use following their surgery and then on discharge from therapy they were asked to complete a patient experience questionnaire by either menti-meter via a QR code on the patient's own smart phone, or a paper copy (Appendix A) was offered and then this data was amalgamated on menti-meter at the end of the study.

Throughout the trial a paper audit (appendix D) was completed by all members of the multi-disciplinary team as to who and when the patient mobilised the first time, date and time the patient was discharged from therapy and date and time discharged from the ward – any delays between the two were documented.

Study

The three metrics were measured throughout the 12 -weeks in the form of:

1. An **experience questionnaire** that patients completed via the menti-meter app or in paper form on discharge from therapy (Appendix A),

2. a **pre and post 12-week trial MDT staff questionnaire** in paper form returned anonymously (Appendix B and C),

3. an **audit in paper form** that was completed during the patient's in-patient stay by all members of the multi-discipline team **to establish length of stay** and incidence of day 0 mobilisation (Appendix D).

	Problem	Consequence	Intervention	How measured?
Patient level	Reduced confidence to walk independently	Less mobile straight after surgery	Mobilise with a Taurus walker	Mentimeter questionnaire on discharge from therapy
Service level	Reliance on physiotherapists to get patients up first-time post op, limited by working hours	Delay to enhanced recovery post op	Training on ERAS with competencies on early mobilization and how to use Taurus walkers effectively for MDT staff	Pre and post-trial questionnaires
System level	Reduced efficiency of enhanced recovery after surgery process	Increased length of stay	Taurus walker available for all elective orthopaedic patients	Audit forms completed by ward staff

Data was transferred from the paper audit tool to Microsoft Excel for analysis. Descriptive statistics were completed using for example pivot tables, scatter charts, counts and calculation of percentages. Menti-meter data was analysed by the internal software and statistics were given in the form of bar charts and a word cloud. The results from each ward are presented individually as the demographics, ASA scoring criteria were different for each area. Unfortunately, there were limitations for comparison on length of stay pre and post-trial as only Courtauld ward, Braintree had comparative length of stay data available from the same 12-week period the year before (2022).

Act

Following the trial, the data was analysed, results were discussed, and relevant changes were proposed with discussion on barriers for change and recommendations for the next PDSA cycle as part of quality improvement and facilitating change.

Results and conclusion

Description of cases

Across the 3 sites there were a total of 157 patients admitted for elective arthroplasty surgery during the 12-week trial, of which 78 hip arthroplasty, 64 knee arthroplasty and 10 uni-knee arthroplasty patients were included in the trial, 5 patients were excluded due to being transferred for enhanced medical care, giving a sample size of 152. The results do not differentiate between age, gender, American Society of Anesthesiologists (ASA) grade or clinical frailty score (CFS) however, the Braintree Hospital is not geographically situated near an acute hospital therefore, patient criteria is specifically for those at 'lower risk' (ASA <3, CFS <5), unlike Broomfield and Basildon where they have an intensive care unit on site and the 'higher risk' patient can go there for surgery.

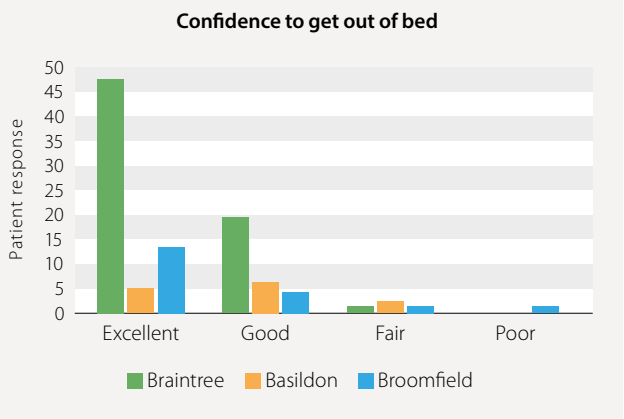
Findings

1 Results from the patient experience questionnaire

Patients self-reported via the menti-meter app or in paper form how they rated the Taurus walker for the following 5 functional tasks; confidence to get out of bed, getting to the toilet independently, feeling safe to walk, pain control whilst walking and ability to walk 60m independently. They were also asked how many times they were mobilised on the day of surgery, the following day and then a free text section where they could share their experiences of using the Taurus walker. There were 99 responses out of a possible 152, which is a 65% response rate. (Braintree: 67/67, Basildon 13/40 and Broomfield 19/45).

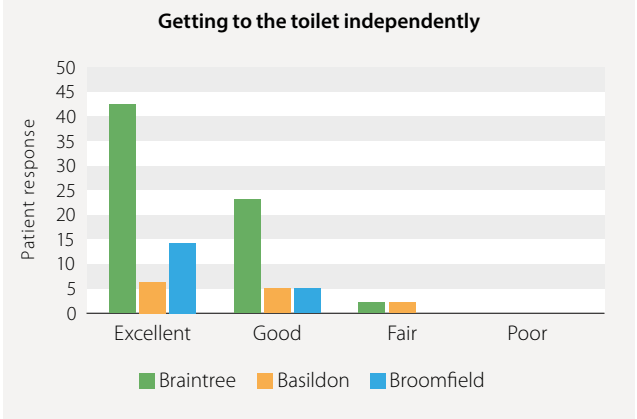
Question 1

65.7% of patients reported that they felt that the Taurus was excellent at giving them confidence to get out of bed.



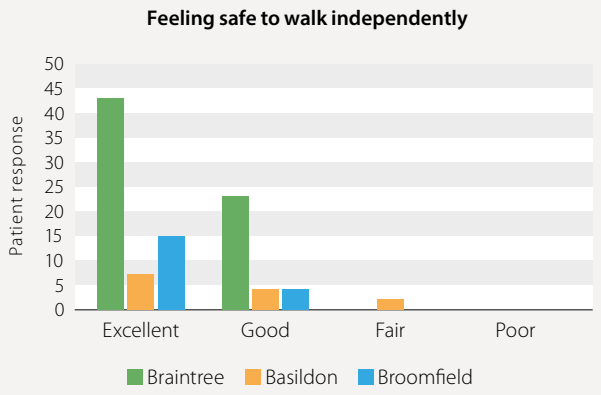
Question 2

96% of patients reported that the Taurus walker was good or excellent at enabling independence to get to the toilet post-surgery.



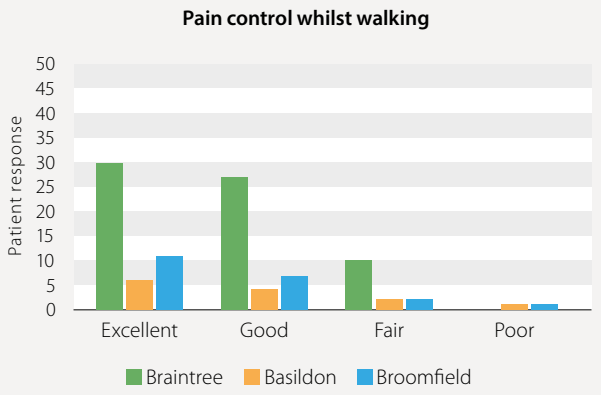
Question 3

96.9% of patients reported that the Taurus walker was good or excellent at making them feel safe to walk independently post-surgery.



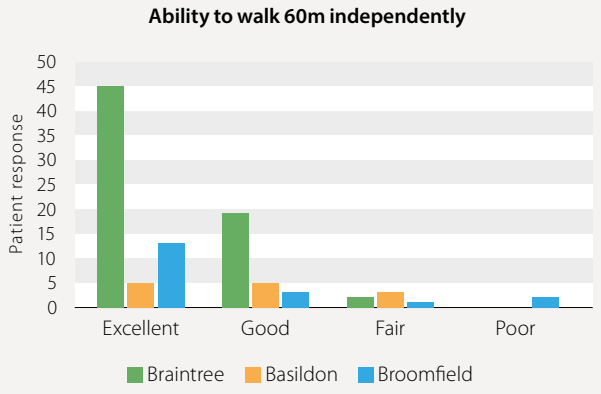
Question 4

85.9% of patients reported that the taurus walker was good or excellent at helping with pain control whilst walking following surgery.



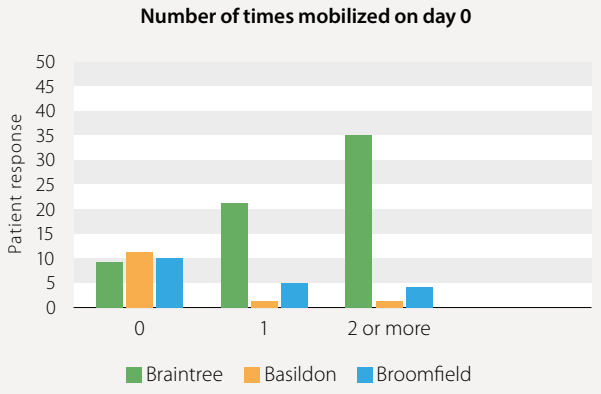
Question 5

90.9% of patients reported that the Taurus walker was good or excellent at enabling them to walk 60m independently following surgery.



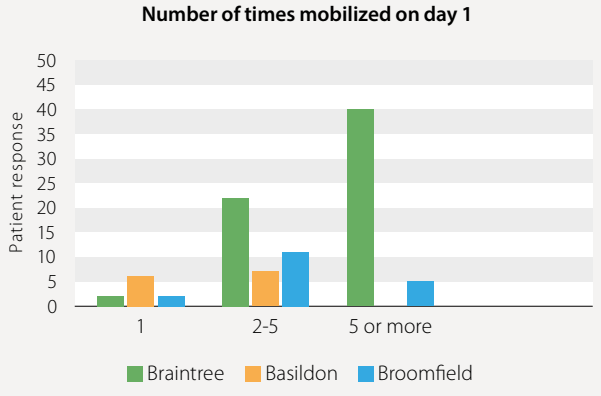
Question 6

30.3% of patients reported that they did not mobilise on the day of surgery, **27.2%** reported that they mobilised once and the remaining **42.5%** stated that they mobilised 2 or more times.



Question 7

85.9% of patients mobilised at least twice on the day after surgery, with **45.5%** mobilising 5 times or more.



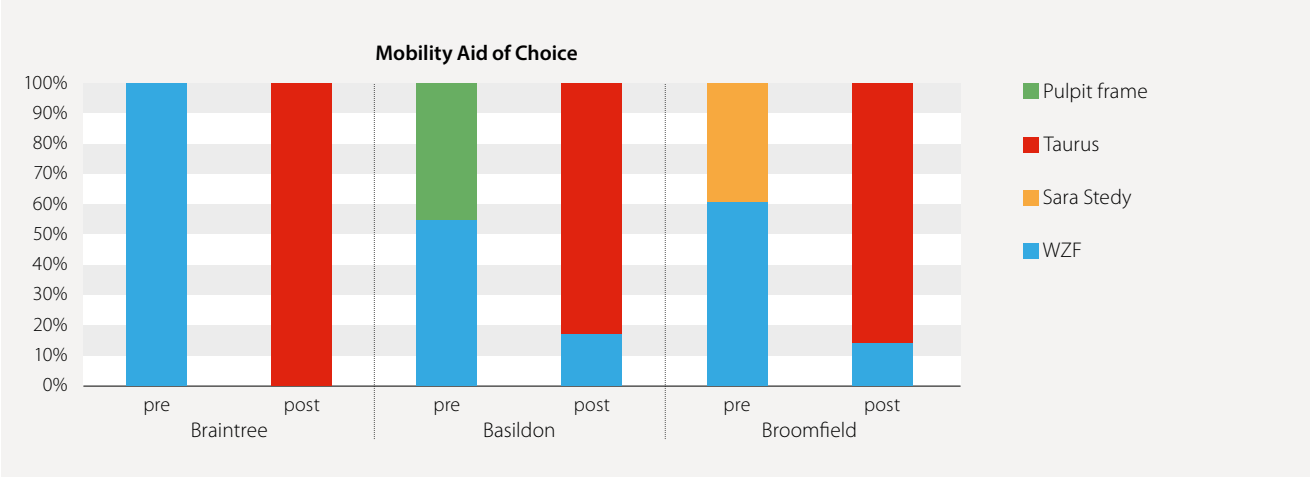
Question 8

This word cloud was developed from the free text where the patients could comment as they wished. Only one patient commented 'not for me I'm afraid' whilst the other **99%** of responses were in approval with the main theme being that the Taurus walker made them feel 'confident', 'and it was easy' and 'excellent' to use', with comments such as 'gives a patient more confidence than the old walker when recovering from an operation'.

2 Results from the pre and post 12-week trial MDT staff questionnaire

Preferred mobility aid of choice

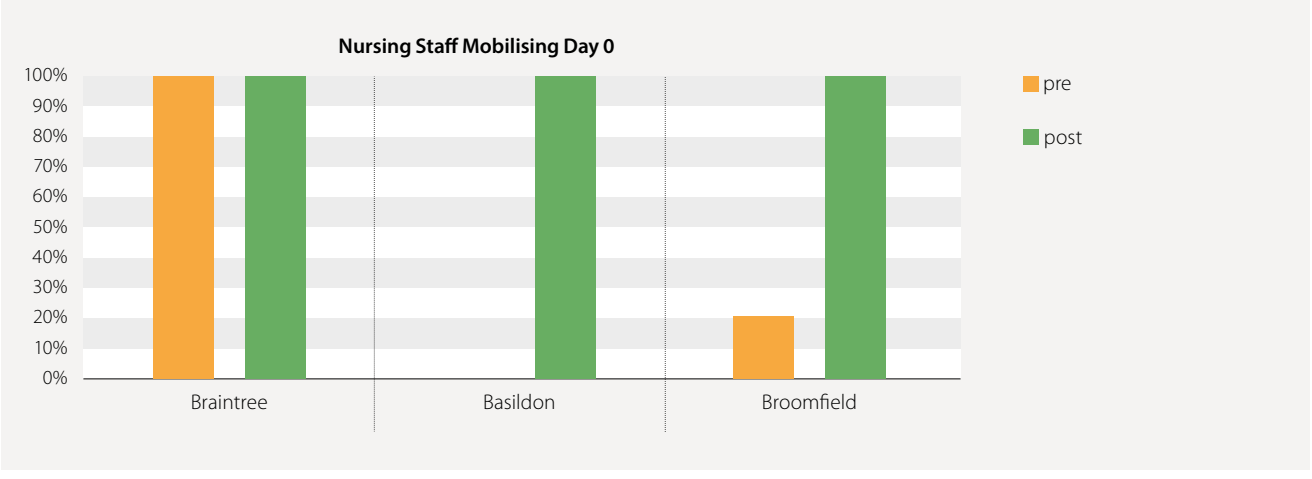
Following the pre-trial questionnaire from all members of the multi-disciplinary team on the wards taking part in the trial, the preferred mobility aid of choice was the wheeled zimmer frame (WZF) at 72% of staff across all three sites. However, the post-trial questionnaire showed that the Taurus walker was unanimously the preferred mobility aid of choice for getting their patients up for the first time by 89.6% of staff with comments such as 'excellent walking aid post op' and 'patients feel confident and empowered to mobilise independently'.



Nursing staff confident to mobilise a patient for the first time on the day of surgery

Pre-trial 100% of nursing staff from Braintree were happy to mobilise a patient on the day of surgery for the first time, compared with 0% at Basildon and 21.4% at Broomfield. However, Braintree also reported that they would transfer out to a chair but would not mobilise to the toilet until seen by a physiotherapist, Basildon reported having a policy where only physiotherapists could get a patient up for the first time and Broomfield reported 'not feeling confident' as their main reason for not mobilising before a physiotherapist.

After the trial, 100% of staff from all sites reported that they would mobilise a patient on the day of surgery if appropriate and not wait for physiotherapists.



Experience of Taurus walker

The post trial questionnaire revealed that 100% of staff across three sites felt confident to use the Taurus walker when mobilising patients for the first-time following hip and knee arthroplasty surgery. 88% stated that it was easy to use around the area of the patient's bedspace and 96% felt that the Taurus walker was easy to clean between patients, easy to use and adjust and that patients were independently mobile earlier and agreed that it had a role to play within enhanced recovery after surgery.

3 Results on length of stay and incidence of day 0 mobilisation

Throughout the trial data was collected for each patient who was part of the study so that comparisons could be made from the same 12-week period the previous year (2022) for each respective area however, unfortunately it was only possible to compare Braintree as the data was not readily available for the Broomfield and Basildon sites.

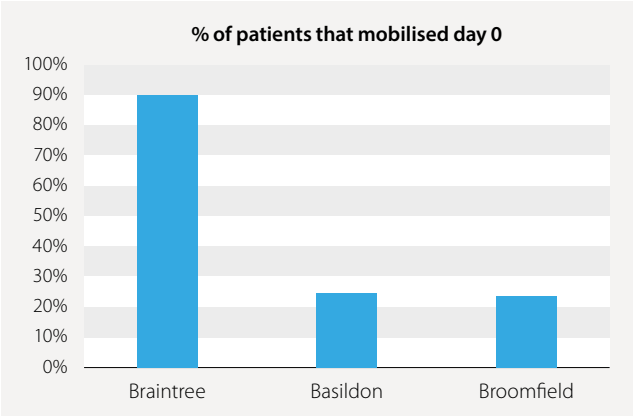
Audit data table

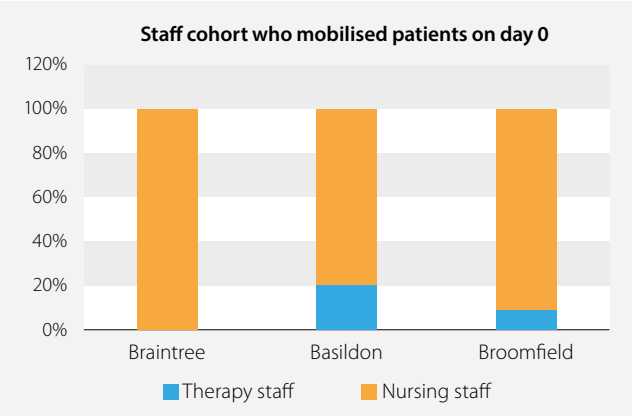
2023	Braintree	Basildon	Broomfield	Combined
Number of patients for each type of surgery:				
THA	30	20	28	78
TKA	29	19	16	64
UKA	8	1	1	10
Total in 12-week trial	**67**	**40**	**45**	**152**
2022 comparison data	*97*	*NA*	*NA*	*NA*
Therapy				
(Total number of bed days)	(94 days)	Insufficient data	(91 days)	Insufficient data
Average length of stay	1.40 days		2.02 days	
Ward				
(Total number of bed days)	(120 days)	187	(130 days)	437
Average length of stay	1.79 days	4.67 days	2.88 days	2.87 days
2022 comparison data	*(225 days) 2.31 days*			
Discharge, mobilisation				
Day 1 discharge therapy	(43) 64.1%	(3) 7.5%	(15) 33.3%	(51) 33.5%
Day 1 discharge from ward *2022 comparison data*	(30) 44.7% *(12) 12.3%*	(2) 5.0%	(9) 20.0%	(41) 26.9%
Day zero mobilisation	(60) 89.5%	(10) 25%	(11) 24.4%	(81) 53.2%
Of which, % mobilised by: – Therapy – Nursing staff	 (0) 0% (60) 100%	 (2) 20.0% (8) 80.0%	 (1) 9.1% (10) 90.9%	 (3) 3.8% (78) 96.2%

Day 0 mobilisation

The number of patients mobilised on the day of surgery were 60 (89.6%) at Braintree, 10 (25%) in Basildon and (11) 24.4% at Broomfield overall, 81 (53.3%) of patients were mobilised.

The staff cohort who mobilised the patients on the day of surgery were predominantly nursing staff with 100% at Braintree, 80% at Basildon and 90.9% at Broomfield accounting for 96.2% overall. The remaining 3.8% of patients were mobilised by physiotherapists.

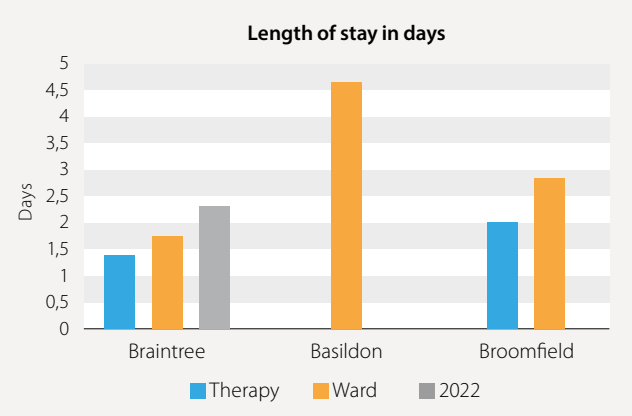




Length of stay

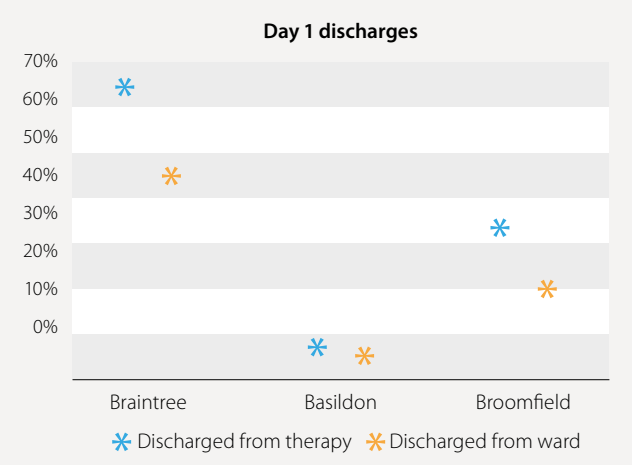
The ward length of stay at each site varies from 1.79 days at Braintree, 4.67 days at Basildon and 2.88 days at Broomfield.

The only comparative data available for 2022 was for Braintree and that was 2.31 days.



Number of day 1 discharges

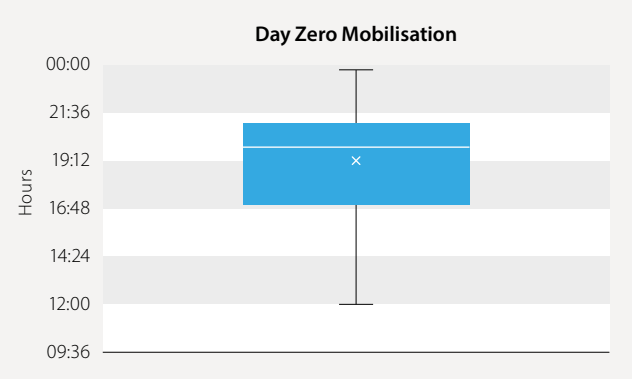
Differences in day 1 discharges between therapy signing a patient as ready for discharge and then actually being discharged off the ward are due to several other factors delaying discharge, such as waiting for check x-ray, wound ooze etc.



Additional data from Braintree, Day 0 mobilisation

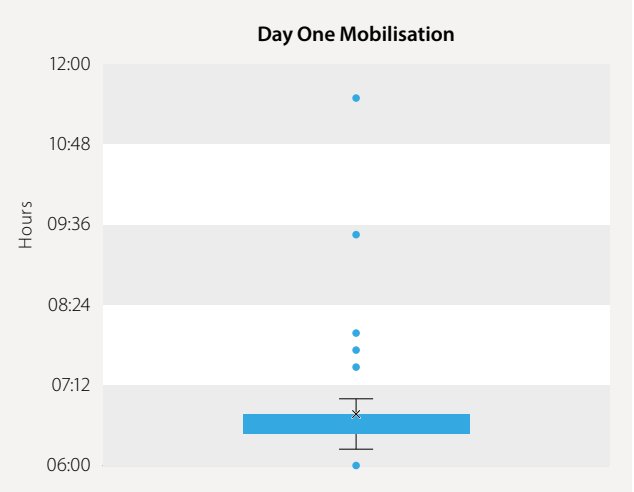
The data collected from Braintree was more comprehensive, which enabled a more detailed analysis.

Day 0 mobilisation data showed that seven patients were not mobilised, one did not specify and 59 were mobilised. Of all of those mobilised on day 0, 100% were mobilised by the nursing staff and the mean time of mobilisation was 19:12 hours.



Additional data from Braintree, Day 1 mobilisation

Day 1 mobilisation data shows that 64 were mobilised by nursing staff, 1 by a physiotherapist and 2 did not specify who they were mobilised by. 100% of patients were mobilised by 11:30 hours across the 12-week trial, with the mean time of mobilisation for day 1 being at 06:30 hours.



Additional data from Braintree, comparative length of stay

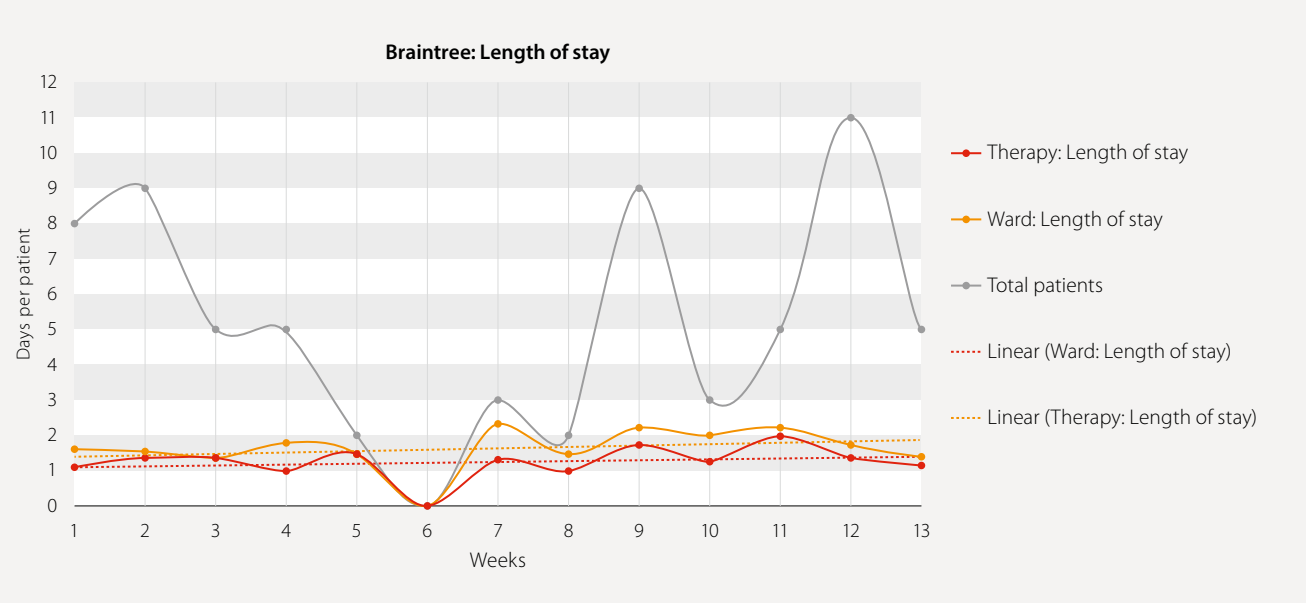
Comparison data for Braintree from 2022 shows that average length of stay for hip and knee arthroplasty fell from 2.31 days (2022) to 1.79 days (2023) which is a bed day saving of 0.52 days per person. This is a saving of £156 – £364 per person, based on bed days being costed at £300- £700 per day. Specific costings for the Braintree site were requested but not available at time of print.

Braintree	2022	2023	Difference
Ward average length of stay	2.31 days	1.79 days	0.52 days less
Day 1 discharge from ward	12.3%	44.7%	32.4% increase

In 2022 the data shows that 12.3% of patients were discharged home on day 1, this increased significantly to 44.7% throughout the trial which would have had a positive impact on length of stay.

Reasons for the differences in length of stay between being discharged from physiotherapy and then being discharged from the ward were documented 52% of the time (11/21 delayed discharges) and these were accounted for however, the remaining 48% were not documented with a specific reason.

In week 6 of the trial, no surgery took place due to the Doctors national strike, therefore the trial was extended by 1 week to encapsulate 12-weeks data.



Discussion

The problem identified at the start of the project was that patients had reduced confidence to mobilise independently following hip and knee arthroplasty surgery, compounded by the culture of waiting for physiotherapists to get patients up and mobilising the first time after surgery which was limited by the working hours of the physiotherapist. The overall effect was a less efficient enhanced recovery after surgery (ERAS) process which prevented a reduced length of stay, high bed turnover and invariably had a financial impact.

The trial was set up with the intention of comparing length of stay for each site with the same 12-week period the year before, unfortunately this data was not available as it was not possible to differentiate each individual site as all data available included a fourth site (Southend Hospital) which was not included in the trial. However, Braintree held their own hip and knee arthroplasty length of stay data, and it was possible to compare outcomes with the same 12-week period during 2022 which was used to determine the cost effectiveness of introducing the Taurus walker.

The patient experience questionnaire had a 100% response rate from Braintree, this was not surprising as they are a dedicated elective arthroplasty ward where staff are used to collecting data and patient reported outcome measures therefore, additional data collection was simply aligned to the patient pathway. In contrast, Broomfield have a mixture of elective and trauma patients on the same ward and as the trial only applied to the elective hip/knee arthroplasty patients, the staff reported that it was difficult to consistently ensure that the right cohort of patients were asked to complete the questionnaire, subsequently the response rate was 42%. Basildon had the lowest response rate at 32.5% but during the 12-week trial they were relocated onto three completely different wards, which was an extremely challenging time for all the staff. However, the results of the patient experience questionnaire were comparable across all three sites and the strongest theme at 96.9% that came through was that the Taurus walker gave the patient confidence to mobilise independently following surgery which helps address the evidence that states patients have a fear of falling when mobilising post-surgery which can delay independent mobility. The most frequent words used by patients to describe the Taurus were 'excellent' and it made them feel 'confident'. Although 85.9% of patients felt that the Taurus was good for helping with pain control whilst walking it would appear that pain is not a limiting factor for mobilising as 90.9% reported that they could walk 60m independently following surgery.

Braintree already had an ERAS pathway that encouraged nursing staff to sit patients in a chair four hours post-surgery and this included encouraging the use of a commode if required, although 25% still preferred to wait for a physiotherapist, the remaining 75% used a wheeled zimmer frame. Whereas pre-trial Broomfield and Basildon reported that the first mobilisation was only to be completed by the physiotherapist, this required a significant change to the ways of working where the training and competencies where essential to empower confidence and competence in day 0 mobilisation across the multi-disciplinary team. Following the trial 100% nursing staff from all three sites were happy to mobilise patients four hours post-surgery, including going to use the bathroom by using the Taurus walker with 89% of staff stating that it was now their mobility aid of choice. The average time to first mobilise a patient after surgery was

at 19:12 hours which is after the physiotherapy team had gone home. The patient questionnaire showed that 42.5% mobilised more than twice on the day of surgery, this was usually for toileting with 95.9% of patients reporting that the Taurus was good at enabling them to get the toilet. There is no doubt that this cultural change to ways of working optimised early mobilisation as part of an ERAS pathway.

Braintree was the only site where length of stay and subsequent cost savings could be compared. Evaluation of length of stay compared with the same period the year before (2022) demonstrated a reduction in length of stay from an average 2.31 days (2022) to 1.79 days (2023). Cost savings per day are documented between £300- £700 (depending on source) therefore a 0.52-day reduction in average length of stay equates to an average cost saving of £156-£364 per person. Any reasons for delayed discharge were documented however 48% of delayed discharges were not documented with a specific reason. At the time of the trial the nursing staff were redeployed to another hospital site if all the patients were discharged that day and not kept in overnight, this led to an increase in patients being kept in without any specific medical need even after discharged by physiotherapy as the nursing staff were reluctant to be redeployed. The operational flow of patients did not ensure that ward was fully optimised every day with day 0 patients therefore, the actual length of stay could have been even lower than the results suggest if the staff were not at risk of being redeployed which did not incentivise them to discharge.

Using the 12-point grid below it is clear that the Taurus walker is effective at promoting independence and confidence in early mobilisation from both the patients and staff perspective, has a role in enhanced recovery after surgery in enabling early mobilisation without having to wait for physiotherapists so that they are not confined to physiotherapists working hours which overall promotes independence for patients and enables them to achieve their functional goals earlier, enabling a safe discharge.

	Problem	Consequence	Intervention	Outcome
Patient level	Reduced confidence to walk independently	Less mobile straight after surgery	Mobilise with a Taurus walker	96.9% of patients felt that the Taurus made them feel confident to mobilise after surgery
Service level	Reliance on physiotherapists to get patients up first-time post op, limited by working hours	Delay to enhanced recovery post op	Training on ERAS with competencies on early mobilisation and how to use Taurus walkers effectively for MDT staff	89% staff chose the Taurus walker as their preferred mobility aid, with 100% of feeling confident to mobilise patients on day of surgery
System level	Reduced efficiency of enhanced recovery after surgery process	Increased length of stay	Taurus walker available for all elective orthopaedic patients	Braintree has shown a saving of £156 – £364 per person (based on £300 – £700 bed cost per day)

Conclusion

The Taurus walker has a significant impact on facilitating the efficient delivery of enhanced recovery after surgery following hip and knee arthroplasty by giving confidence to nursing staff to mobilise patients four hours post-surgery whereby, regardless of what time of day the patient returns from theatre they were still able to be mobilised on the day of surgery. The Taurus made the patients feel confident to mobilise independently which meant that they achieved their functional outcomes earlier, leading to reduced length of stay which facilitates a high bed turnover and demonstrates cost savings per patient.

The suggestion for the next stage of the PDSA (Plan-Do-Study-Act) would be to look at reasons for delayed discharge in more detail as this trial has shown that early mobility by the wider multi-disciplinary team using the Taurus walker as part of the enhanced recovery after surgery (ERAS) pathway has had a significant positive impact.

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Appendices

APPENDIX A

Patient experience paper copy questionnaire

NHS
Mid and
South Essex
NHS Foundation Trust

Pick one item on each line to rate the Taurus walker for the following activities:

	Excellent	Good	Fair	Poor
Confidence to get out of bed				
Getting to the toilet independently				
Feeling safe to walk independently				
Pain control whilst walking				
Ability to walk 60m independently				

NHS
Mid and
South Essex
NHS Foundation Trust

How many times did you get up on the day of your operation?

0 ☐ 1 ☐ 2 or more ☐

How many times did you get up on the day after your operation?

0 ☐ 1-2 ☐ 2-5 ☐ more than 5 ☐

Did you have any concerns whilst using the Taurus walker?

.....

Did you have any other comments about the Taurus walker?

.....

.....

.....

Thank you for your comments

APPENDIX B

Staff pre-trial questionnaire

Pre project staff questionnaire:

1) Which member of the MDT are you?

☐ Nurse ☐ HCA ☐ Physio ☐ OT ☐ Therapy assist

2) On average how many staff members does it take to get a post op elective orthopaedic patient out of bed for the first time?

1 ☐ 2 ☐ 2 or more ☐

3) What is your current mobility/manual handling aid of choice to get a patient out of bed following an elective joint arthroplasty (THR/TKR/UKR)?

.....

4) Do you leave the patient for the therapy staff to get out of bed following an elective joint arthroplasty (THR/TKR/UKR)?

Yes ☐ No ☐ Sometimes ☐

5) If 'yes'or 'sometimes' to the question 4, why?

.....

Thank you for your time.

KEY

HCA	Health Care Assistant
Physio	Physiotherapist
OT	Occupational Therapist
THR	Total Hip Replacement
TKR	Total Knee Replacement
UKR	Unicompartmental Knee Replacement

APPENDIX C

Staff post-trial questionnaire

End of project staff questionnaire:

Which member of the MDT are you?

☐ Nurse ☐ HCA ☐ Physio ☐ OT ☐ Therapy assist

Was the Taurus easy to use in the bedspace?

Yes ☐ No ☐ Unsure ☐

Did you feel confident to use the Taurus with elective orthopaedic post op patients'

Yes ☐ No ☐ Unsure ☐

Do you think the Taurus has a role to play within enhanced recovery after surgery?

Yes ☐ No ☐ Unsure ☐

Did you find that patients were independently mobile earlier using the Taurus?

Yes ☐ No ☐ Unsure ☐

Was the Taurus easy to use and adjust for each patient?

Yes ☐ No ☐ Unsure ☐

Was the Taurus easy to clean?

Yes ☐ No ☐ Unsure ☐

Based on your experience of using the Taurus, did it have an impact on staff workload, if so – how?

.....

How frequently did you use the Taurus with elective orthopaedic patients post op?

.....

Do you have any concerns about using the Taurus walker?

.....

When you had a choice of walking aids, which did you choose to use?

.....

Is there anything else you would like to say about the Taurus walker?

.....

.....

.....

APPENDIX D

Ward staff audit form

Patient Sticker

Taurus Audit

Surgeon:

Type of Replacement: Left ☐ Right ☐ Total Hip ☐ Total Knee ☐ Uni Knee ☐

Date of Surgery: _____/_____/_____

Day 0 Mobilisation: Yes No Date & Time: _____

Who Mobilised: Name/Role _____

Reason if not mobilised? (See guidance below)_____

Day 1 Mobilisation: Yes No Date & Time: _____

Who Mobilised: Name/Role _____

Reason if not mobilised? (See guidance below)_____

Date/Time of 1st therapy mobilisation: _____

Date/Time of discharge from Therapy :_____

Reason if discharge delayed? (See guidance below) _____

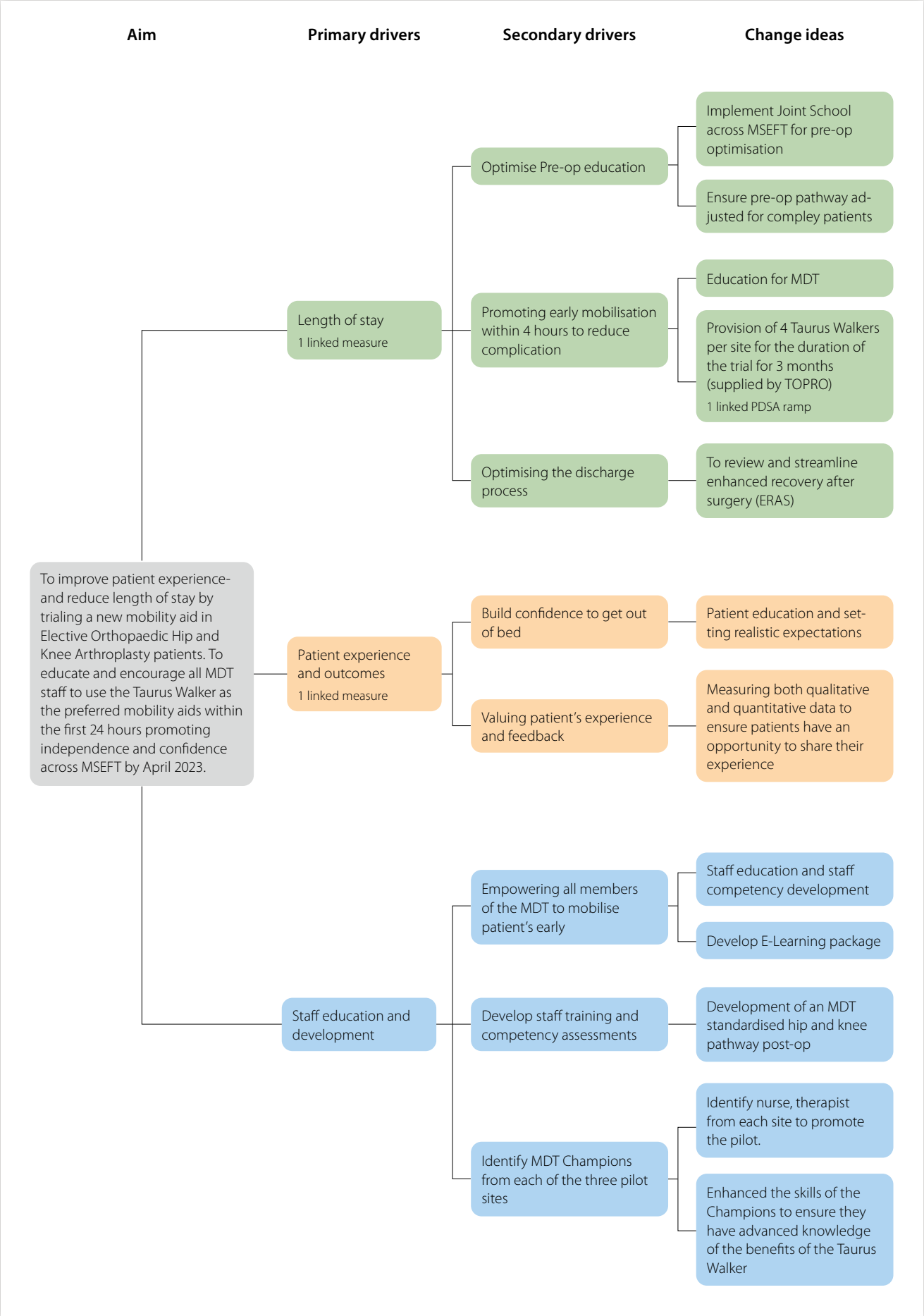
Time/Date: Patient left ward _____

Possible reasons for delayed mobilization/discharge

Nausea/Vomiting	**Pain**	**Hypotension**	**Dizziness**
Sedation	**Motor Block/Weakness**	**Urinary Incontinence**	**Urinary retention**
AKI	**Pre-existing condition**	**Social Issues**	**Other: Please state**

APPENDIX E

Driver diagram



TOPRO Taurus

Walker with forearm support

Key features

- Easily adjustable to body size and shape, user weight up to 150 kg and user height up to 210 cm
- Two model variants: with hydraulic or electric height adjustment
- Four multi-directional non-slip wheels that rotate on their own axis for easier access to bathrooms etc.

Special benefits

- Increases patients' self-confidence in being able to mobilize immediately after surgery
- Promotes the patient's independence and independent early mobilization
- Proven faster recovery with shortened length of stay

Manufacturer

TOPRO Industri AS
Rambekkvegen 1
2816 Gjøvik
Norway

Phone: (+47) 61 13 46 00
E-mail: info@topromobility.com