



Day surgery unicompartmental knee arthroplasty – The paradigm in enhanced recovery.



WEE Liang Hao James¹, WONG Xiu Qing Clara², YAP Yan Mei³, TAN Tong Leng⁴, QUEK Jinlin Terence⁵, TANG Lai San Adeline⁶, WONG Luak Pak⁷, ZHANG Jian Cai David⁸, TOK Xue Hui⁹

Tan Tock Seng HOSPITAL

^{1,4}Consultant, Orthopedic Surgery Department, ²Principal Physiotherapist, Physiotherapy Department, ³Senior Physiotherapist, Physiotherapy Department, ⁵Consultant, Anaesthesiology, Intensive Care & Pain Medicine Department, ⁶Consultant, Anaesthesiology, Intensive Care & Pain Medi Department, ⁷Nurse Clinician I, Nursing Speciality Department, ⁸Principal Occupational Therapist, Occupational Therapy Department, ⁹Senior Occupational Therapist, Occupational Therapy Department

Adding years of healthy life

BACKGROUND

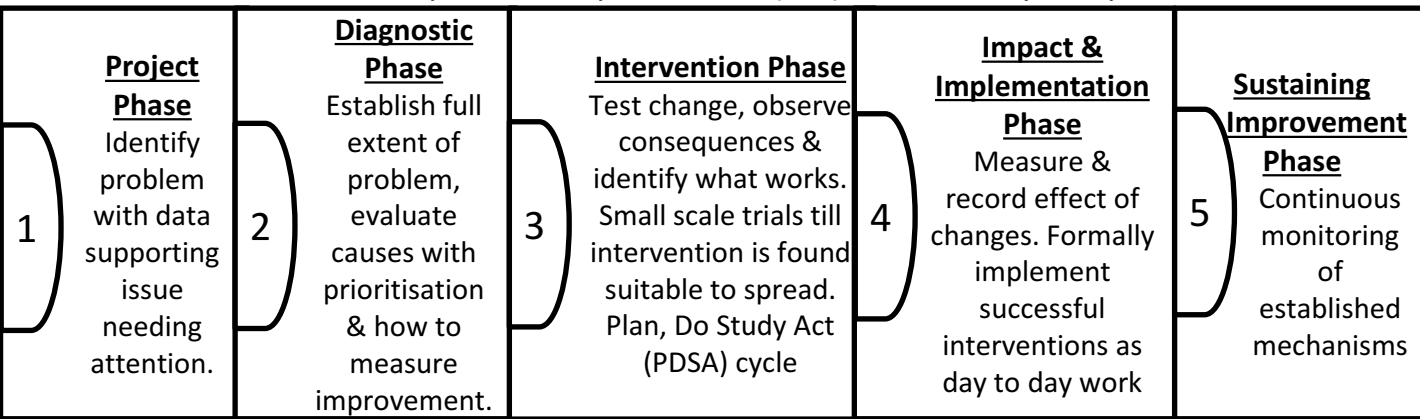
Data from 2018-2019 revealed that patients undergoing Unilateral Knee Arthroplasty (UKA) in TTSH had an average length of stay (ALOS) of 3.9 days. In contrast, Oxford University Hospital in the UK reported ALOS of 1.5 days with an accelerated recovery protocol post-UKA, with no negative effects¹. The authors reported improved bed occupancy rates and cost savings. Therefore, our team decided to review our practices and redesign the model of care to bring about systemic change in managing patients undergoing UKA. We aim to safely reduce the ALOS post UKA, improve inpatient bed availability, reduce costs, and improve patient outcomes.

IMPETUS FOR CHANGE

TTSH is one of Singapore's largest multi-disciplinary hospitals with high bed occupancy rates. To improve bed availability for emergency admissions, it is crucial to facilitate safe and timely discharge of patients following elective surgery. With evidence from overseas practice illustrating good outcomes from an accelerated program, the team decided to embark on this project.

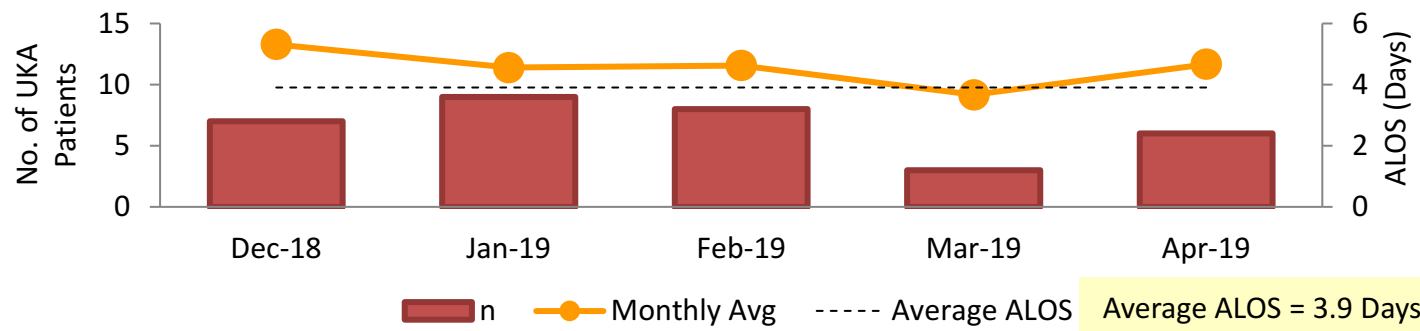
Strategy

Our team utilize the clinical practice improvement (CPI) model and principles:



1) Project Phase

Diagram 1. Pre project ALOS for UKA Patients in TTSH



2) Diagnostic Phase

Diagram 2. Pre intervention workflow

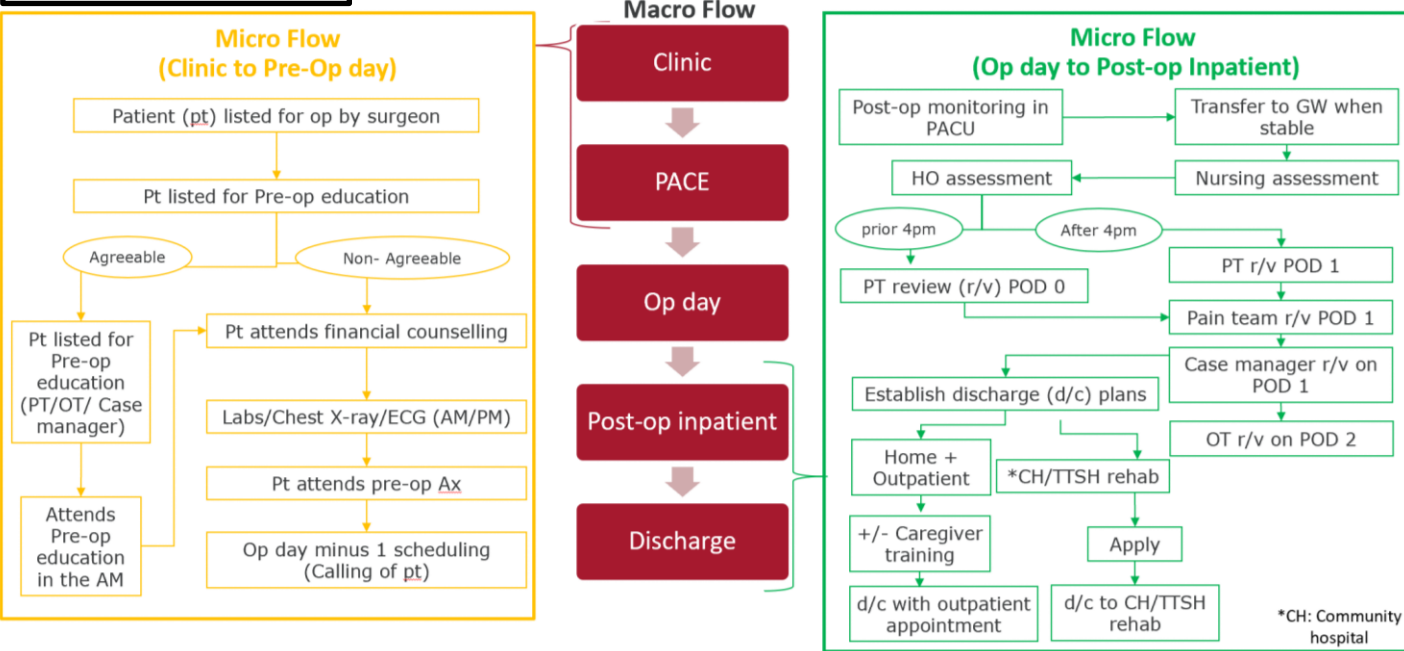


Diagram 3. Root Cause Analysis

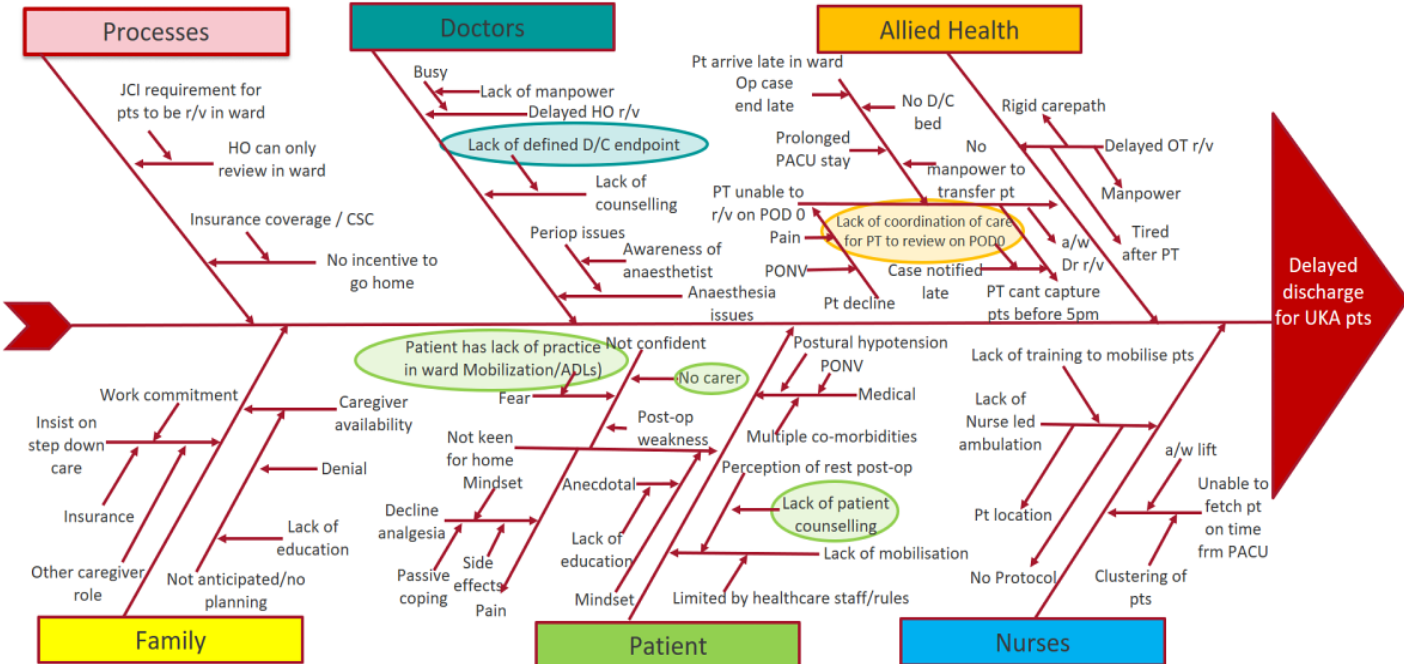
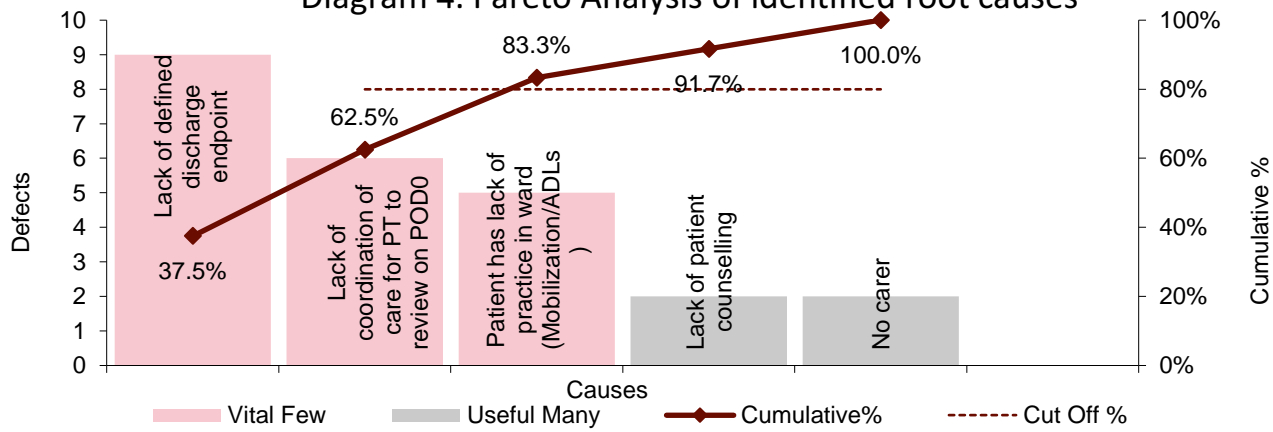
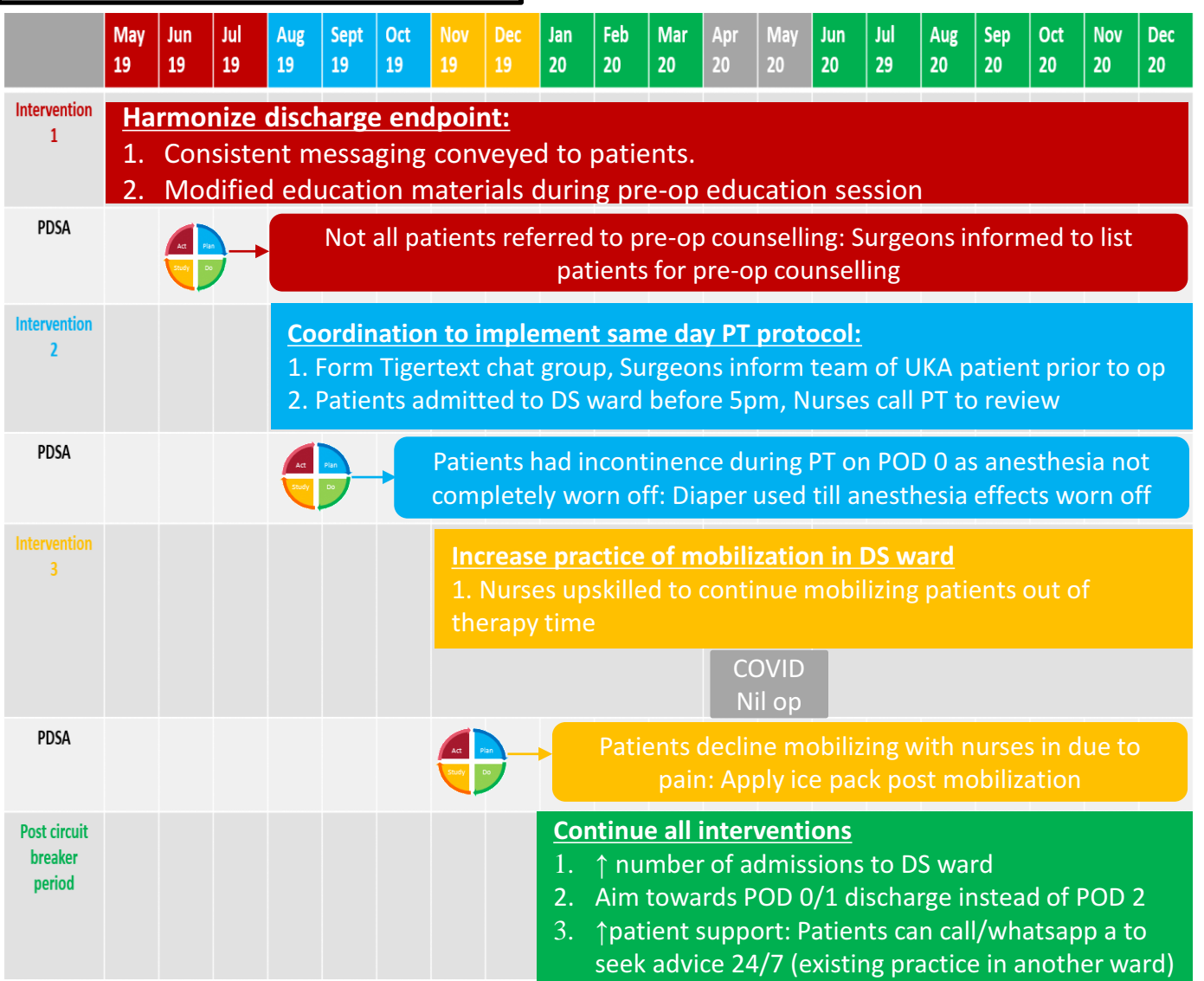


Diagram 4. Pareto Analysis of identified root causes



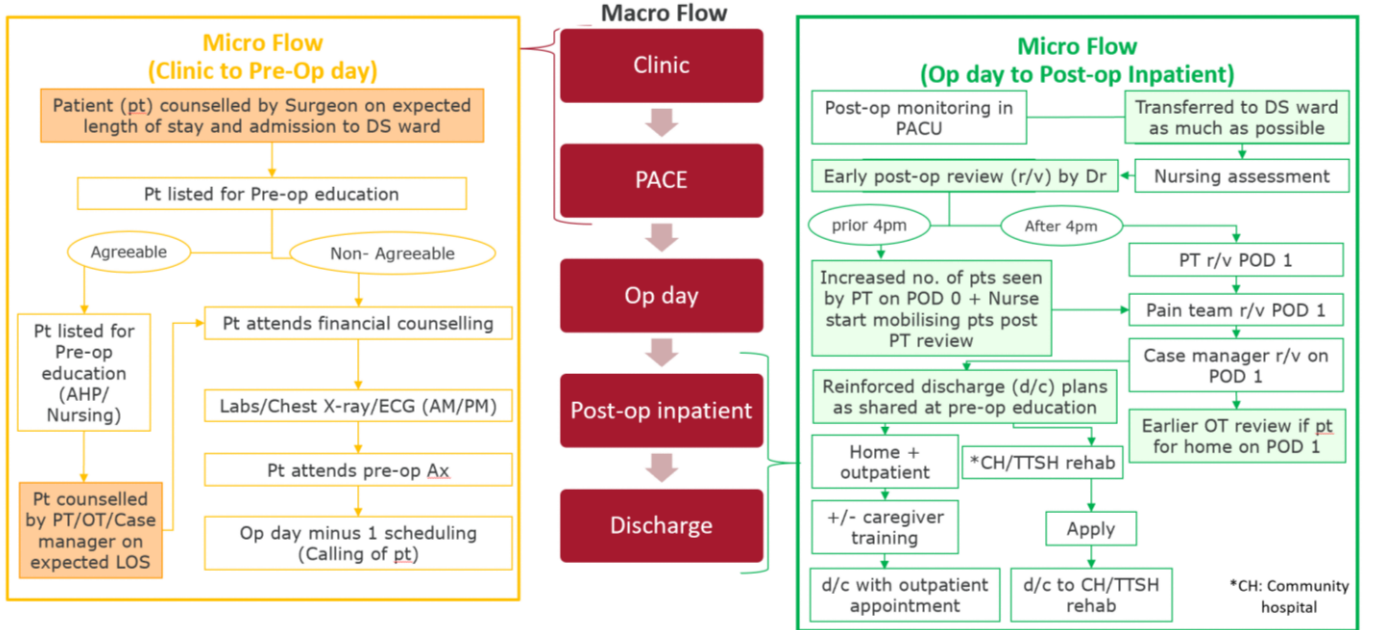
REDESIGNING THE SYSTEM & IMPEMENTING

3) Intervention Phase + Timeline



4) Impact & Implementation Phase

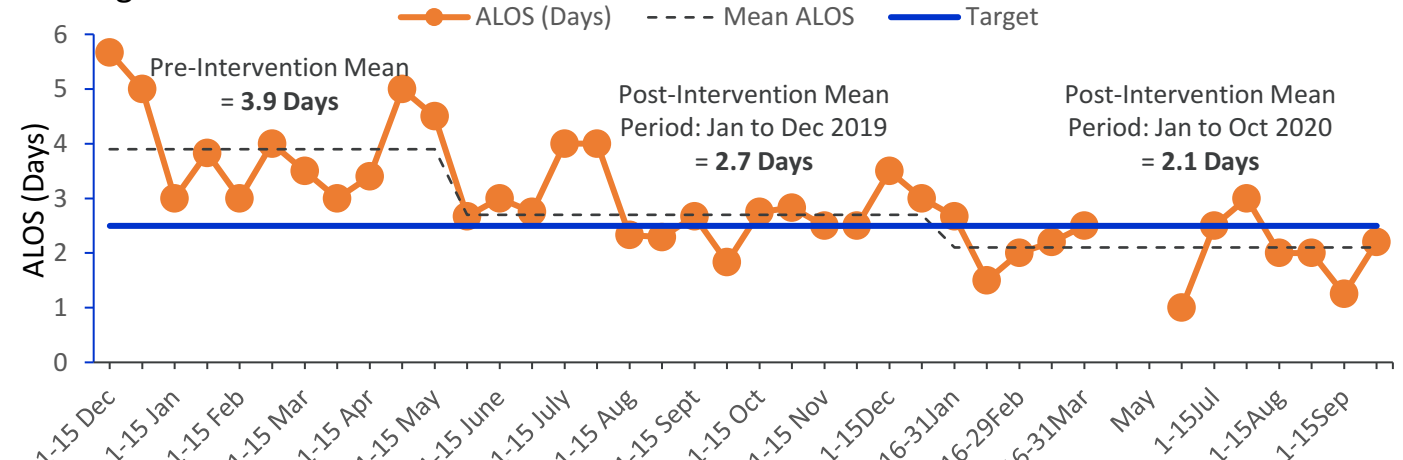
Diagram 5. Post intervention workflow



EVALUATION AND MEASUREMENT OF IMPROVEMENT

5) Sustaining Improvement Phase

Diagram 5. Run chart on ALOS for UKA Patients in TTSH from Pre to Post Intervention



- Systemic change across the multi-disciplinary healthcare team has become the standard procedure for patients undergoing UKA surgery in TTSH
- Patients now routinely discharge on POD 1/2 with improved ALOS from 3.9 to 2.1 days
- Use of DS wards and reduction in ALOS has freed up valuable inpatient beds for emergency admissions
- On average, patients undergoing DS UKA saved \$4276.73 compared to those admitted to inpatient wards
- Patients undergoing DS UKA had the shortest ALOS of 1.87 days compared to those who went to an Orthopedic ward (ALOS of 2.58days) or general ward (ALOS 3.48 days)

CONCLUSION

Achieving primary and stretch goal is possible with a well-coordinated multi-disciplinary team effort. Working on one intervention at a time allows accurate evaluation of effectiveness of each intervention. Applying the PDSA cycle identifies and addresses practical issues faced by staff on the ground during implementation of change, and this improves work processes and efficacy of interventions. UKA patients admitted to the DS ward benefitted from this as there were notable cost savings. Early mobilization helps to improve patient confidence in self-care post-UKA. Well-coordinated pre and post-operative care ensure that patients were discharged earlier. DS UKA allows the hospital to reap benefits from freeing up bed space in the inpatient wards for acutely ill patients.

Reference: 1. Reilly KA, Beard DJ, Barker KL, Dodd CA, Price AJ, Murray DW. Efficacy of an accelerated recovery protocol for Oxford unicompartmental knee arthroplasty--a randomised controlled trial. Knee. 2005 Oct;12(5):351-7.