

Same Day Discharge Knee Osteotomy: The Results of a High-Volume Canadian Centre

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Disclosure of Conflict of Interest

We have nothing to declare for this study

- Osteotomies about the knee worldwide are usually performed as an inpatient procedure.
- Recently there has been an increasing emphasis on same day discharge (SSD) in orthopaedics.
- The benefits of SSD are not limited to clinical outcomes, but also advantageous to resource stressed healthcare environments.
- There are very few studies in the literature on day case knee osteotomy, none of these studies investigated cost-effectiveness.



- The purpose of this study is to investigate the success of same day discharge for knee osteotomy compared with inpatient care, with a focus on safety and associated costs.

- Retrospective service evaluation 1st June 2020 – 31st October 2023
- Inclusion Criteria:
All patients between who had primary high tibial osteotomy or distal femoral osteotomy with minimum of 6-month follow-up
- Exclusion Criteria: revision osteotomy procedures
- Key parameters recorded:
 - Success of SDD
 - 30-day ED attendances, readmissions
 - 6-month complication, re-operation rate
 - Total provider costs
- Participants were divided into three groups based on facility and admission type: University Hospital (UH) Overnight Stay (UH OS), UH SDD and Ambulatory Surgery Centre (ASC) SDD
- Statistics:
 - Clinical outcomes compared using chi-square test of independence
 - Cost analysis was compared between groups using an analysis of variance (ANOVA)

Demographics

| Characteristic | UH OS (n = 355) | UH SDD (n = 157) | ASC SDD (n = 74) | p-value |
|----------------|--------------------|---------------------|---------------------|---------|
| Age | 50.8 ± 9.8 | 50.6 ± 9.3 | 49.1 ± 10.2 | 0.69 |
| Sex | | | | |
| Male | 246 (69.3) | 109 (69.4) | 46 (62.2) | 0.46 |
| Female | 109 (30.7) | 48 (30.6) | 28 (37.8) | |
| BMI | 32.2 ± 6.5 | 29.9 ± 4.8 | 30.0 ± 4.9 | 0.64 |
| Alignment | | | | |
| Varus | 321 (90.4) | 145 (92.4) | 68 (91.9) | 0.34 |
| Valgus | 32 (9.0) | 10 (6.4) | 4 (5.4) | |
| Tibial Slope | 2 (0.6) | 2 (1.3) | 2 (2.7) | |
| Side | | | | |
| Left | 165 (46.5) | 83 (52.9) | 34 (45.9) | 0.67 |
| Right | 188 (53.0) | 73 (46.5) | 39 (52.7) | |
| Bilateral | 2 (0.6) | 1 (0.6) | 0 (0) | |
| Osteotomy Type | | | | |
| Tibial | 330 (93.0) | 146 (93.0) | 69 (93.2) | 0.81 |
| Femoral | 20 (5.6) | 8 (5.1) | 5 (6.8) | |
| Bilateral | 5 (1.4) | 3 (1.9) | 0 (0) | |
| ASA | 2.3 ± 0.6 | 2.0 ± 0.7 | 1.8 ± 0.6 | <0.001 |
| Anesthetic | | | | |
| General | 200 (56.3) | 76 (48.4) | 61 (82.4) | <0.001 |
| Spinal | 155 (43.7) | 81 (51.6) | 13 (17.6) | <0.001 |
| Block | 14 (3.9) | 18 (11.5) | 36 (48.6) | <0.001 |

- **Totals (all patients, n = 586)**
- Successful One day care at ASC SDD: 100 % (74/74)
- Successful One day care at UH SDD: 90.4% (142/157)
- Readmission within 30 days = 0% (0/586)
- Emergency department re-visits within 30 days = 18 (3.1%)
 - 1x confirmed DVT
 - 3x calf swelling: US neg for DVT
 - 3x Pain
 - 1x urinary retention
 - 3x wound management
 - 4x erythema shin/cellulitis- PO Abx
 - 1x abdominal pain ? Obstruction
 - 1x angioedema- unrelated

- Re-operations overall = 191 (32.6%)
- Re-operations within 6 months excluding metalwork removal = 17 (2.9%)
 - 6 deep infection
 - 7 metalwork failure/nonunion/malunion/delayed union
 - 1 tibial tubercle osteotomy fracture requiring revision fixation
 - 1 MUA for stiffness
 - 1 retained piece of drain
- Complications within 6 months = 31 (5.3%)
 - 6 deep infection
 - 7 metalwork failure/ malunion requiring revision, 2 got subsequent infection
 - 1 tibial tubercle osteotomy fracture requiring revision fixation
 - 2 hinge fracture requiring intra op ORIF
 - 5 DVT
 - 3 cellulitis
 - 2 stiffness requiring intervention
 - 1 reclosure wound
 - 2 urinary retention
 - 1 retained drain tip

| Outcome | UH OS n=355 Absolute Risk (%) | UH SDD n=157 Absolute Risk (%) | ASC SDD n=57 Absolute Risk (%) | p-value |
|---------------------------------------|-------------------------------------|--------------------------------------|--------------------------------------|----------------|
| ED visit (30 days) | 2.8 | 1.9 | 6.8 | n.s. (0.12) |
| Complications (6m) | 5.6 | 4.5 | 5.4 | n.s. (0.86) |
| Re-operation (overall) | 32.1 | 33.8 | 32.4 | n.s. (0.93) |
| Re-operation (6m) excluding metalwork | 3.4 | 2.5 | 1.4 | n.s. (0.61) |

No significant difference in proportion/absolute risk of any negative clinical outcome between patients at UH OS, UH SDD, ASC SDD

- All patients (n=495)

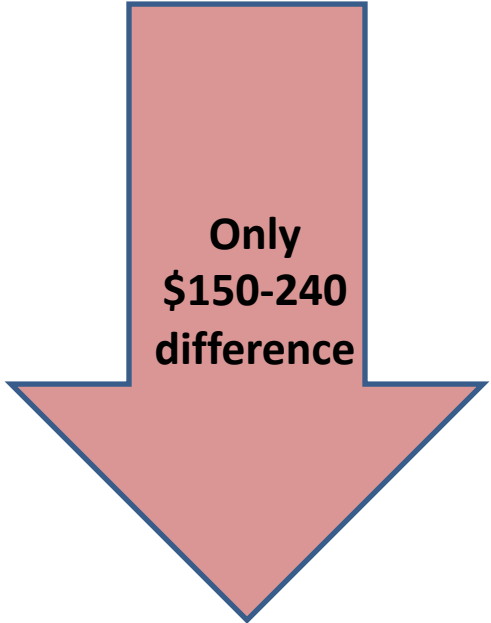
| Facility | Total cost (\$, mean \pm SD) |
|---------------------|--------------------------------|
| UH OS (n = 292) | 7768.96 \pm 1967.30 |
| UH SSD (n = 147) | 6516.16 \pm 1802.31 |
| ASC SDD (n = 56) | 2338.46 \pm 409.97 |

- Mean difference UH SDD vs ASC SDD = 4177.70 \pm 158.43
- Mean difference UH OS vs ASC SDD = 5430.50 \pm 127.50
- Mean difference UH SDD vs UH OS = 1252.8 \pm 188.02

ANOVA p-value < 0.001

- Costs: Excluding LOS >1 day

| Facility | Total cost (mean \pm SD) |
|---------------------------|----------------------------|
| UH Overnight (n = 264) | 7576.77 \pm 1885.25 |
| UH Same Day (n = 141) | 6273.65 \pm 917.57 |
| VH Same Day (n = 56) | 2338.46 \pm 409.97 |



**Only
\$150-240
difference**

- Mean difference UH SDD vs ASC SDD = 3935.19 \pm 94.72
- Mean difference UH OS vs ASC SDD = 5238.30 \pm 128.31
- Mean difference UH SDD vs UH OS = 1303.12 \pm 139.41

ANOVA p-value < 0.001

- Same day discharge for knee osteotomies is a **SAFE** option for patients.
- There is no significant difference in complication rate, 30-day ED reattendance, 30-day readmission or reoperation rate.
- There is significant cost saving for same day discharge at our Ambulatory Surgery Centre vs Hospital Setting.

Therefore, if patient factors allow, same day discharge for patients undergoing knee osteotomy should be considered

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