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Effect of the Enhanced Recovery After Surgery (ERAS) Perioperative Protocol on Short Term Outcomes of Joint Replacement Surgery

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Background

- **ERAS:** Multimodal, multi-disciplinary approach for establishing procedure–specific, evidence-based perioperative protocols designed to optimize patient outcomes after surgery
- **Principles:**
  - Minimize patient's surgical stress response
  - Standardized anesthesia protocol
  - Multimodal pain control (minimize opioids; utilize central, peripheral, and local nerve blockade)
  - Maintenance of homeostasis (normothermia, goal-directed fluid therapy)
  - Early feeding and mobilization
  - Minimize use of tubes, drains, catheters
  - Prospective database tracking and auditing

ERAS Protocol

Preoperative	Intraoperative	Postoperative
• Patient counseling and education • Avoid mechanical bowel preparation • Solids up to 6 hours prior to surgery • Clear liquids up to 2 hours prior to surgery • 20 oz. of gatorade or clear apple juice 2-3 hours before surgery • Acetaminophen 1000 mg P.O., Celecoxib 400 mg P.O., Gabapentin 600 mg P.O. in preoperative holding area	• Regional anesthesia - spinal, CSE, PNB • No foley catheter • 1g IV Tranexamic Acid, 2g IV Magnesium, 10mg IV Decadron prior to incision • Minimally invasive surgical approach • Local anesthetic - "OrthoMix" - 25 cc Ropivacaine 1%, 30 mg Ketorlac, 0.5 mg Epinephrine, +/- Morphine Sulfate • Normovolemia • Normothermia • Avoid drains	• ATC: Acetaminophen 1000 mg TID, Tramadol 50 mg q6h, Ketorlac 15 mg IV q6h x 3 doses followed by Celecoxib 200 mg daily, Gabapentin 100 mg TID • PRN: Oxycodone 5-10 mg q3h PRN • Decadron 10 mg IV on morning of POD #1 - additional postoperative N/V prophylaxis as needed • Ambulate with PT POD #0 • IV fluids discontinued within 24 hours • Regular diet within 24 hours

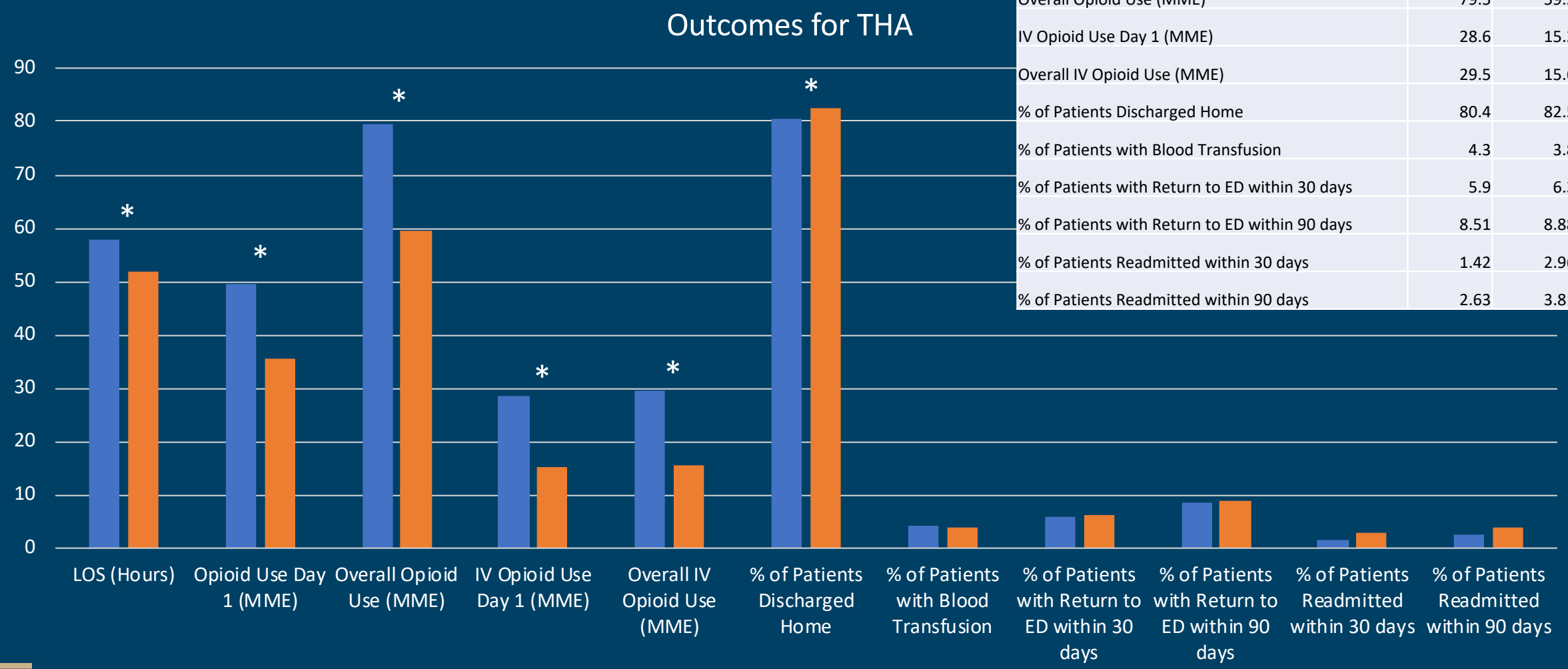
Methods

- ERAS protocol collectively instituted March 1, 2017 at 245-bed community hospital (multi-surgeon)
- All primary THA & TKA performed in the year preceding and following protocol initiation were included
- LOS, opioid use, patient disposition, morbidity, and readmission/return to ED were analyzed
- Student's t-test and chi-square test were used for statistical analysis

Pre-ERAS THA*		Post-ERAS THA**	Pre-ERAS TKA*		Post-ERAS TKA**
Total No. of Patients	494	473	Total No. of Patients	575	563
Ave. Age (yrs.)	68.41	67.79	Ave. Age (yrs.)	69.51	70.33
Ave. BMI	27.74	27.65	Ave. BMI	29.94	29.97
Female	313	290	Female	364	369
Male	181	183	Male	211	194
% Medicare	59.11	56.66	% Medicare	62.61	64.48
Laterality:			Laterality:		
Bilateral	12	9	Bilateral	6	5
Left	209	202	Left	264	253
Right	273	262	Right	305	305
*3/1/2016--2/28/2017			**3/1/2017--2/28/2018		

Results - THA

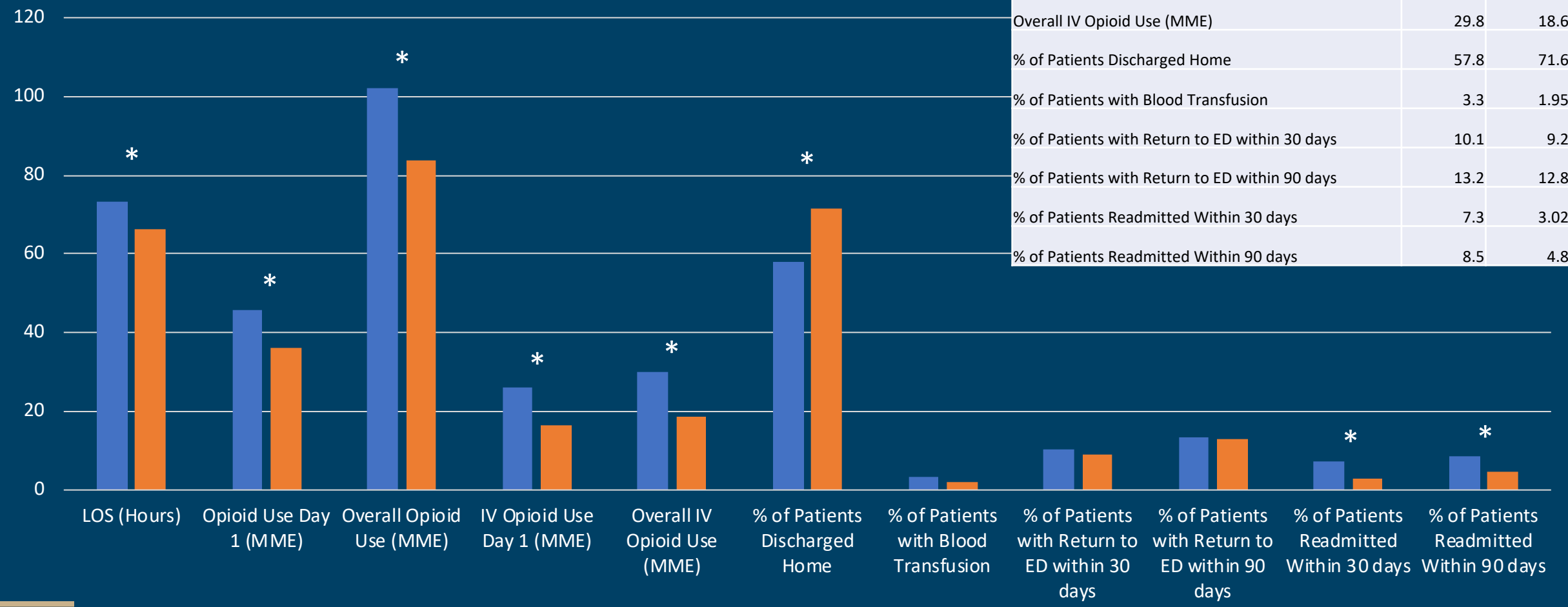
	preERAS	postERAS
LOS (Hours)	57.8	51.9
Opioid Use Day 1 (MME)	49.5	35.4
Overall Opioid Use (MME)	79.5	59.5
IV Opioid Use Day 1 (MME)	28.6	15.2
Overall IV Opioid Use (MME)	29.5	15.6
% of Patients Discharged Home	80.4	82.5
% of Patients with Blood Transfusion	4.3	3.8
% of Patients with Return to ED within 30 days	5.9	6.3
% of Patients with Return to ED within 90 days	8.51	8.88
% of Patients Readmitted within 30 days	1.42	2.96
% of Patients Readmitted within 90 days	2.63	3.81



* Denotes statistical significance ($p<0.05$)

Results - TKA

	preERAS	postERAS
LOS (Hours)	73.3	66.4
Opioid Use Day 1 (MME)	45.5	36.2
Overall Opioid Use (MME)	101.9	83.9
IV Opioid Use Day 1 (MME)	26.1	16.5
Overall IV Opioid Use (MME)	29.8	18.6
% of Patients Discharged Home	57.8	71.6
% of Patients with Blood Transfusion	3.3	1.95
% of Patients with Return to ED within 30 days	10.1	9.2
% of Patients with Return to ED within 90 days	13.2	12.8
% of Patients Readmitted Within 30 days	7.3	3.02
% of Patients Readmitted Within 90 days	8.5	4.8



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Conclusion

- In primary THA & TKA, the ERAS protocol significantly reduces LOS, increases patient disposition to home, reduces overall and IV opioid consumption, and trends towards decreasing blood transfusion rates.
- For THA, this is achieved without a statistically significant difference in early readmission rates or return to the ED.
- For TKA, the ERAS protocol significantly reduces overall readmission rates in the 30- and 90-day postoperative periods.
- Further research is underway to determine if the ERAS protocol affects functional outcomes scores following primary THA & TKA.