PRISMA HEALTH SM

The Effect of ERAS on Narcotic Utilization in Gynecologic Surgery Post-Operative Care

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Disclosure

- I have no meaningful conflicts of interest to disclose.

Background

- Enhanced Recovery After Surgery (ERAS)
  - What is it?

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    - It’s NOT Celebrex/Lyrica

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    - It’s NOT an order set
    - It’s NOT zero narcotics

Background

- Enhanced Recovery After Surgery (ERAS)
  - What is it?
    - It’s NOT Celebrex/Lyrica
    - It’s NOT an order set
    - It’s NOT zero narcotics
    - It DOES NOT take away decision making

Background

- Enhanced Recovery After Surgery (ERAS)
  - What is it?
    - Pre-operative counseling and optimization
    - Intraoperative management
    - Post-operative management

Background

- Traditional pathways of post-operative care lean heavily on opioids/narcotics to provide relief for surgical pain.
  - Opioid side effects: constipation, urinary retention, nausea, confusion, respiratory depression, etc.

Background

- Potential for abuse and dependence
  - 5.9% of post-op patients develop dependence[3]
  - 1999-2017 ~218,000 US deaths due to overdose related to prescription opioids[4]

Background

- Growing pressure from government, society, patients, and physicians to improve opioid stewardship

Background

- ERAS programs have been shown to reduce use of opioids.[8-27]
- ERAS programs already in use in Gyn/Onc and colorectal surgery services.
- Use of these protocols continues to spread.

Objective

- To examine opioid use and prescribing for patients undergoing open surgery for benign gynecologic indications.

Hypothesis

- Implementation of an ERAS protocol would result in less opioid use in both the inpatient and outpatient post-operative phases of care.

Methods

Methods

- An ERAS protocol was designed and implemented
  - Included input for Gynecology, Gyn/Onc, Anesthesiology, and nursing using current recommendations from the literature.

Methods

Preadmission and Preoperative Phase	
Preop Counseling	Patients will receive standardized preoperative counseling via discussion and IRB approved printed materials with expectations regarding postoperative pain, incentive spirometry, ambulation, DC goals; This counseling will also include the benefits of smoking cessation 4 weeks preop and alcohol abstinence in alcohol abusers.
Bowel Prep	Mechanical bowel preparations will not be used, including in cases with possible resection.
Preop Fasting	No solids after midnight prior to surgery. Patients to consume 12-20 Oz high carb/electrolyte drink 3 hours prior to surgery.
Preop VTE PPx	Patients with risk factors started on preop LMWH or Heparin, in addition to mechanical methods immediately prior to surgery.
Multimodal Preop Pain Management	Celebrex 400 mg PO, Lyrica 75 mg PO, Tylenol 1 g PO.

Methods

Intraoperative Phase	
Anesthsia	1) Induction: Propofol/Rocuronium, Lidocaine, Decadron, 20-30 mg Ketamine, PRN Esmolol 2) Maintenance: Esmolol PRN, Lidociane 2 mg/min, Ketamine infusion at 4 mcg/kg/min (both Ketamine, Lidocaine drips Dced prior to emergence); Zofran at case end. Marcaine 0.5% injected in incision sites at case end.
Intraop Fluids	1L bolus LR at case start with maintenance to continue with LR 3ml/kg/hr.
Intraop VTD PPX	Mechanical methods will be be used (LMWH/Hep as well if indicated).
Anitmicrobial skin prep	IV abx w/in 1 hour of incision; Hair will be clipped and not shaved if removal necessary; Chlorhexidine-alcohol based skin prep used instead of iodine when possible.
Nasogastric Tubes	If NGT necessary, it will be inserted intraop will be removed before awakening.
Peritoneal drainage	Drains will not be used, including after bowel resection/lymphadenectomy.

Methods

Postoperative Phase	
Analgesia	75 mg Lyrica PO Q12h until discharge; Tylenol Q6h for 48h; NSAIDs, Celebrex, Narcotic for rescue pain; Consider Ketamine 1-2mcg/kg/min x 48h or thoracic epidural in narcotic-dependent patients.
Urinary Drainage	Discontinue urinary catheters in PACU.
Early Mobilization	Mobilization POD#0 > 2 hr UOB/Chair, POD#1> 6-8 hr UOB/Chair; All patients will receive incentive spirometry instruction.
Postop Fluids	POD#0 IVF reduced to LR/NS 40 ml/hr ,POD#1 DC IVF.
Postop Nutrition	Start regular (or patient indicated) diet 4 hr post op.
Postop Ileus Prevention	Start bowel regimen POD#0 with regimen including Docusate 1 tab PO BID.
Postop VTE PPx	SCDs used in all patients when not ambulating. Pharmaceutical anticoagulation started 24h postop in patients with high VTE risk.
Postop Glucose Control	In patients with DM, adjust insulin to maintain blood glucose <180-200.

Methods

- Effecting change

Methods

- Gynecology
- Anesthesiology
- Nursing
- Clinic

Methods

- January 1, 2018 ERAS began for GYN

Methods

- Prospective cohort study measuring opioid prescribing while inpatient for post-operative benign gynecologic surgery patients after implementation of an ERAS protocol.

Methods

- Consecutive patients aged 18 and older undergoing scheduled open surgery for benign GYN indications were included.

Methods

- Excluded:
  - Patients under age 18
  - Patients who had unscheduled surgery
  - Patients with cancer

Methods

- Historical control cohort
  - January 1, 2017-December 31, 2017

Methods

- ERAS cohort
  - January 1, 2018-December 31, 2018

Methods

- Primary outcome:
  - Median MME administered post-operatively during admission
    - Calculated by conversion of all IV and oral opioids administered to oral morphine milligram equivalents

- Secondary outcomes:
  - Pain scores
  - Length of stay
  - Time to DC orders
  - Complications
  - Readmission
  - Discharge home with opioids
  - Discharge home with non-narcotic pain medication

Statistical Analysis

- Continuous variables are reported as median (interquartile-range) and differences between ERAS and no ERAS groups were tested using Wilcoxon rank-sum.
- Discrete variables are reported as N (%) and differences between ERAS and no ERAS groups were tested using Chi-square test or Fisher's exact test for small sample sizes (N<5).
- Values of P less than 0.05 were considered statistically significant.
- All analyses were carried out using R statistical software (R Foundation for Statistical Computing, version 3.4.3, Vienna Austria).

Results

Results

- 30 ERAS cases
  - 27 total abdominal hysterectomies
  - 1 exploratory laparotomy
  - 2 abdominal myomectomy

Results

- 34 no ERAS cases
  - 28 total abdominal hysterectomies
  - 3 exploratory laparotomy
  - 3 abdominal myomectomy
  - 2 cases after ERAS implementation
    - 1 refused ERAS following counseling
    - 1 did not receive ERAS for undocumented reasons

Results

Demographics

	Table 1.	ERAS	No ERAS	p-value
N		30	34	
Age, N(%)				0.396
	18 - 29	2 (6.67)	3 (8.82)	
	30 - 39	9 (30)	11 (32.35)	
	40-49	16 (53.33)	19 (55.88)	
	50 - 59	3 (10)	0 (0)	
	61 - 69	0 (0)	1 (2.94)	
Case Type, N (%)				0.754
	Total Abdominal Hysterectomy	27 (90)	28 (82.35)	
	Exploratory Laparotomy	1 (3.33)	3 (8.82)	
	Abdominal Myomectomy	2 (6.67)	3 (8.82)	
BMI, N(%)				0.360
	18.5- 24.9	5 (16.67)	5 (14.71)	
	25 - 29.9	4 (13.33)	11 (32.35)	
	30 - 34.9	9 (30)	6 (17.65)	
	35 - 39.9	5 (16.67)	3 (8.82)	
	> 40	7 (23.33)	9 (26.47)	
Diabetes mellitus, N(%)		2 (6.67)	4 (11.76)	0.676
Hypertension, N(%)		12 (40)	11 (32.35)	0.606
Hx. Chronic Narcotics, N(%)		0 (0)	2 (5.88)	0.494
Hx. Illicit Drugs, N(%)		3 (10)	5 (14.71)	0.713
Hx. Alcohol Abuse, N(%)		0 (0)	2 (5.88)	0.494
Hx. Tobacco Use, N(%)		9 (30)	18 (52.94)	0.079
Current Tobacco Use, N(%)		7 (23.33)	13 (38.24)	0.281
Ethnicity, N(%)				0.047
	Caucasian	7 (23.33)	18 (52.94)	
	African American	14 (46.67)	11 (32.35)	
	Hispanic	9 (30)	5 (14.71)	
Number previous Abd. Surgeries				0.125
	1	15 (50)	19 (55.88)	
	2	4 (13.33)	10 (29.41)	
	3	6 (20)	4 (11.76)	
	4+	5 (16.67)	1 (2.94)	

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Results

	ERAS	No ERAS	p-value
N	30	34	
Case Type, N (%)			0.754
TAH	27 (90)	28 (82.35)	
Ex. Lap	1 (3.33)	3 (8.82)	
Abd Myomectomy	2 (6.67)	3 (8.82)	
LOS, N (%)			0.245
0 days	0 (0)	1 (2.94)	
1 day	6 (20)	2 (5.88)	
2 days	16 (53.33)	21 (61.76)	
3 days	5 (16.67)	3 (8.82)	
4 days	1 (3.33)	5 (14.71)	
5+ days	2 (6.67)	2 (5.88)	
Time from surgery to DC orders placed			0.509
1 = 12-18 hr	0 (0)	0 (0)	
2 = 19- 24 hr	0 (0)	1 (2.94)	
3 = 25 - 30 hr	0 (0)	1 (2.94)	
4 = 31 - 36 hr	2 (6.67)	1 (2.94)	
5 = 37 - 42 hr	4 (13.33)	9 (26.47)	
6 = 43 - 48 hr	7 (23.33)	5 (14.71)	
7 = 49 - 54 hr	4 (13.33)	3 (8.82)	
8 = 55 - 60 hr	0 (0)	0 (0)	
9 = 61 - 72 hr	9 (30)	6 (17.65)	
10 = > 73 hr	4 (13.33)	8 (23.53)	
Morphine Milligram Equiv, Median (IQR)	59 (31, 97)	112 (72, 194)	<0.001
DC with non-narcotic, N (%)	30 (100)	21 (61.76)	<0.001
DC with opioid N (%)	23 (76.67)	33 (97.06)	0.021
Need for NGT, N (%)	1 (3.33)	2 (5.88)	1.000
Readmission within 30 days, N (%)	1 (3.33)	4 (11.76)	0.360
Complication, N (%)	3 (10)	7 (20.59)	0.313
Mild Complication, N (%)	3 (10)	6 (17.65)	0.483
Severe Complication, N (%)	0 (0)	2 (5.88)	0.494
Death, N (%)	0 (0)	0 (0)	NA

Primary and secondary outcomes

Results

Pain Scores

	ERAS	No ERAS	p-value
N	30	34	
Pain Scale, POD 0			0.549
0 - 3	2 (6.67)	3 (8.82)	
4 - 6	14 (46.67)	11 (32.35)	
7 - 10	14 (46.67)	20 (58.82)	
Pain Scale, POD 1			0.487
0 - 3	6 (20)	3 (8.82)	
4 - 6	13 (43.33)	16 (47.06)	
7 - 10	11 (36.67)	15 (44.12)	
Pain Scale, POD 2			0.063
0 - 3	9 (30)	2 (5.88)	
4 - 6	15 (50)	20 (58.82)	
7 - 10	5 (16.67)	8 (23.53)	
DC	1 (3.33)	4 (11.76)	
Pain Scale, POD 3			0.606
0 - 3	1 (3.33)	(0)	
4 - 6	3 (10)	2 (5.88)	
7 - 10	10 (33.33)	9 (26.47)	
DC	16 (53.33)	4 (11.76)	

Discussion

Discussion

- Significant reduction in inpatient opioid use
  - MME 59 vs 112 (P <0.001)
- Higher percentage of patients were prescribed non-narcotic pain medication on discharge
  - 100% vs 61.76% (P<0.001)
- Lower percentage of patients were prescribed opioids on discharge
  - 76.67% vs 97.06% (p 0.021)
- **No difference in pain scores**

Conclusion

- Implementation of the ERAS protocol resulted in less reliance on opioids without worsening pain scores.
- Consider ERAS protocol to optimize care and decrease reliance on opioids in GYN surgeries.
- Benefits extend beyond LOS, post-op goals, cost, etc.

Strengths

- Performed at large academic center.
- Much of the published literature comes from Gyn/Onc and colorectal.

Weaknesses

- Not a randomized clinical trial
- Likely underpowered for secondary outcomes
- Patient satisfaction omitted due to paucity of data
- Subjective nature of pain assessment and rotating house staff introduces variability

Future Directions

- Quality of life
- Morbidity and mortality
- Other GYN surgeries

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References

1. Kehlet H. Multimodal approach to control postoperative pathophysiology and rehabilitation. Br. J Anaesth. 1997; 78:606-17.
2. Carey ET, Moulder JK. Perioperative management and implementation of enhanced recovery programs in gynecologic surgery for benign indications. Obstet Gynecol. 2018 Jul;132(1):137-146
3. Brummett CM, Waljee JF, Goeslinh J, et al. New persistent opioid use after minor and major surgical procedures in US adults. JAMA Surg. 2017;152:e170504
4. Scholl L, Seth P, Kariisa M, Wilson N, Baldwin G. Drug and opioid-involved overdose deaths-united states, 2013-2017. Morb Motal Wkly Rep. EPub: 21 December 2018
5. Moon YE, Lee YK, Lee J, Moon DE. The effects of preoperative intravenous acetaminophen in patients undergoing abdominal hysterectomy. Arch Gynecol Obstet 2011;284:1455-60
6. American Society of Anesthesiologists Task Force on Acute Pain Management. Practice guidelines for acute pain management in the perioperative setting:an update report by the american society of anesthesiologists task force on acute pain management. Anesthesiology 2012;116:248-73
7. Clarke H, Bonin RP, Orser BA, Englesaki M, Wijeysundera DN, Katz J, et al. The prevention of chronic postsurgical pain using gabapentin and pregabalin: a combined systematic review and meta-analysis. Anesth Analg 2012;115:428-42
8. Beverly A, Kaye AD, Ljungqvist O, Urman RD. Essential elements of multimodal analgesia in enhanced recovery after surgery (ERAS) guidelines. Anesthesiol Clin. 2017 Jun;35(2):e115-e143
9. Scheib SA, Thomassee M, Kenner JL. Enhanced recovery after surgery (ERAS) in gynecology: a review of the literature. J Minim Invasive Gynecol. 2018 Dec 20. pii: S1553-4650(18)31415-8.
10. Smith HJ, Leath CA 3rd, Straughn JM Jr. Enhanced recovery after surgery in surgical specialties: gynecologic oncology. Surg Clin North Am. 2018 Dec;98(6):1275-1285
11. Trowbridge ER, Evans SL, Sarosiek BM, Modesitt SC, Redick DL, Tiouririne M, Thiele RH, Hedrick TL, Hullfish KL. Enhanced recovery program for minimally invasive and vaginal urogynecologic surgery. Int Urogynecol J. 2018 Oct 29. doi: 10.1007/s00192-018-3794-0. [Epub ahead of print]
12. Kehlet H, Joshi GP. Enhanced recovery after surgery: current controversies and concerns. Anesth Analg. 2017 Dec;125(6):2154-2155
13. Nikodemski T, Biskup A, Taszarek A, Albin M, Chudecka-Głaz A, Cymbaluk-Płoska A, Menkiszak J. Implementation of an enhanced recovery after surgery (ERAS) protocol in a gynaecology department - the follow-up at 1 year. Contemp Oncol (Pozn). 2017;21(3):240-243
14. Nelson G, Dowdy SC, Lasala J, Mena G, Bakkum-Gamez J, Meyer LA, Iniesta MD, Ramirez PT. Enhanced recovery after surgery (ERAS®) in gynecologic oncology - Practical considerations for program development. Gynecol Oncol. 2017 Dec;147(3):617-620.

References

15. Care 2009;18:236-40Trowbridge ER, Dreisbach CN, Sarosiek BM, Dunbar CP, Evans SL, Hahn LA, Hullfish KL. Review of enhanced recovery programs in benign gynecologic surgery. Int Urogynecol J. 2018 Jan;29(1):3-11

16. Leissner KB, Shanahan JL, Bekker PL, Amirfarzan H. Enhanced recovery after surgery in laparoscopic surgery. J Laparoendosc Adv Surg Tech A. 2017 Sep;27(9):883-891

17. Modesitt SC, Sarosiek BM, Trowbridge ER, et al. Enhanced recovery implementation in major gynecologic surgeries: effect on care standardization. Obstet Gynecol. 2016;128:457–466.

18. Wijk L, Franz_en K, Ljungqvist O, Nilsson K. Implementing a structured enhanced recovery after surgery (ERAS) protocol reduces length of stay after abdominal hysterectomy. Acta Obstet Gynaecol Scand. 2014;93:749–756.

19. Kalogera E, Bakkum-Gamez JN, Jankowski CJ, et al. Enhanced recovery in gynecologic surgery. Obstet Gynecol. 2013;122:319–328.

20. Chapman JS, Roddy E, Ueda S, Brooks R, Chen L, Chen L. Enhanced recovery pathways for improving outcome after minimally invasive gynecologic oncology surgery. Obstet Gynecol. 2016;128:138–144.

21. Anderson AD, McNaught CE, MacFie J, Tring I, Barker P, Mitchell CJ. Randomized clinical trial of multimodal optimization and standard perioperative surgical care. Br. J Surg 2003; 90: 1497-504

22. Khoo CK Vickery CJ, Forsyth N, Vinall NS, Eyre-Brook IA. A prospective randomized controlled trial of multimodal perioperative management protocol in patients undergoing elective colorectal resection for cancer. Ann Surg 2007; 245:867-72.

23. Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP. Enhanced recovery pathways optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery. Surgery 2011; 149:830-40.

24. Spanjersberg WR, Reurings J, Keus F, van Laarhoven CJ. Fast track surgery versus conventional recovery conventional recovery strategies for colorectal surgery. The Cochran Database of Systematic Reviews 2011, Issue 2. Art. No.: CD007635

25. Ottensen M, Sorensen M, Kehlet H, Ottensen B. Short convalescence after vaginal prolapse surgery. Acta Obset Gynecol Scand 2003;82:359-66

26. Ottensen M, Soresnsen <, Rasmussen Y, Smidt-Jensen S, Kehlet H, Ottensen B. Fast track vaginal surgery. Acta Obest Gynecol Scand 2002;81:138-46

27. Sjentne IS, Krogstad U, Odegard S, Engh ME. Improving quality by introducing enhanced recovery after surgery in a gynaecological department: consequences for ward nursing practice. Qual Saf Health

- Thank you!