

## Introduction

- Radical cystectomy with urinary diversion (C&D) is performed for patients with muscle-invasive bladder cancer (MIBC) or refractory carcinoma in situ (CIS)
- C&D patients receive one of several types of diversion depending on their age, comorbidities, functional status, and extent of disease (Figure 1)
- Post-operative length of stay (LOS) can be prolonged (9-11 days) and 30 day readmission rates and mortality elevated (30% and 1.5%); return of bowel function usually the rate-limiting step to discharge
- Enhanced Recovery After Surgery (ERAS) protocols utilize pre-, intra-, and post-operative elements in order to improve return of bowel function and decrease LOS
- Alvimopan is a  $\mu$ -opioid receptor antagonist commonly included in ERAS, and limits deleterious effects of narcotics on the GI system
- The goal of this analysis was to determine the effect of Alvimopan on post-operative LOS and 30 day readmission in patients undergoing C&D

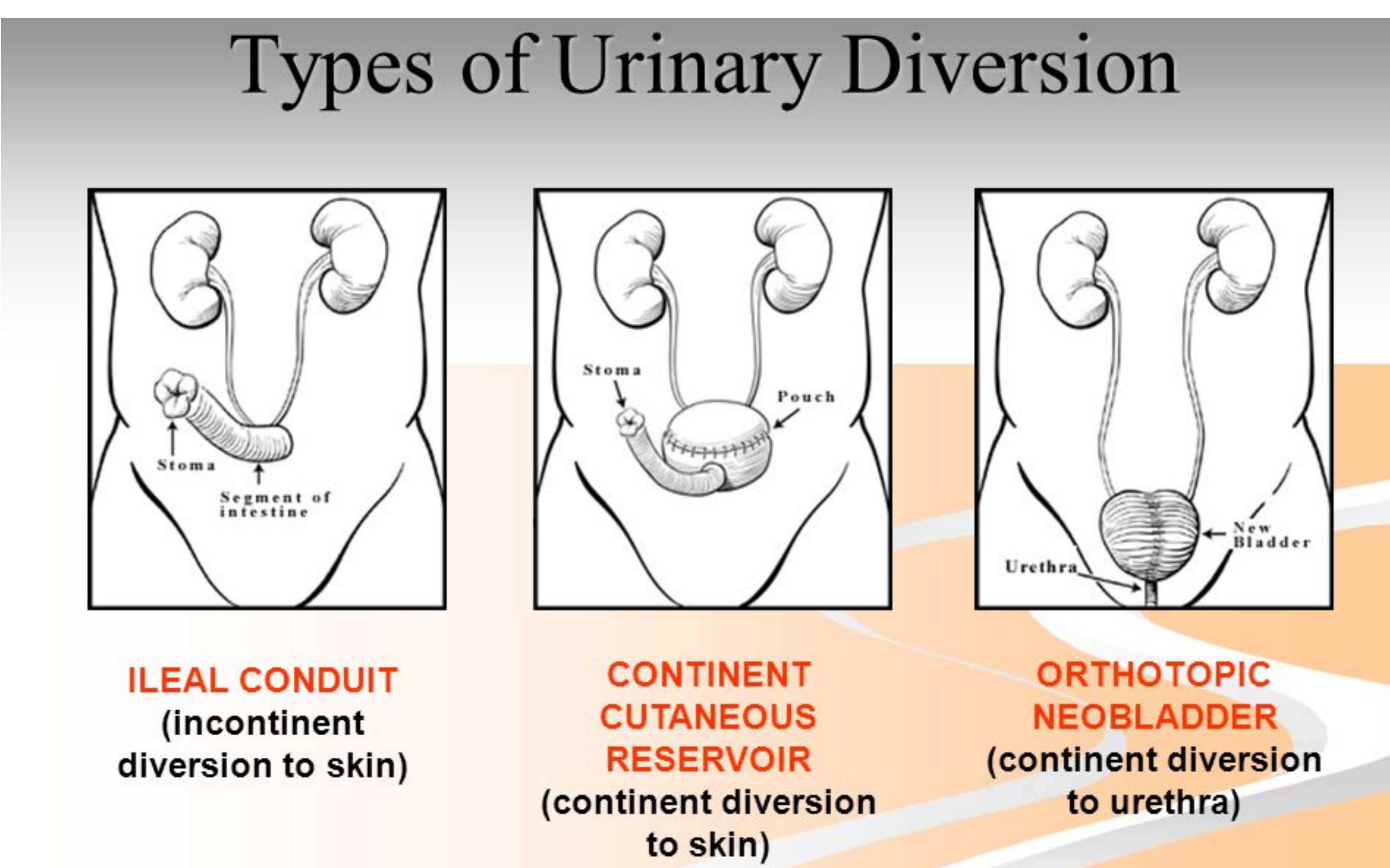


Figure 1. Urinary diversion follow radical cystectomy.

## Project Design

- Retrospective analysis of all consecutive patients undergoing C&D for bladder cancer at Thomas Jefferson University in 2017-18 calendar year
- All patients given PO Alvimopan as per existing protocols 5 hours and 30 minutes pre-operatively and continued until bowel function returned post-operatively
- Patient demographics, as well as intra- and post-operative data were collected (Table 1)
- LOS and post-operative data were compared to well-designed, contemporary C&D series in which Alvimopan was given

## Results

- 57 patients underwent C&D for MIBC or CIS (50 with documented Alvimopan data)
- Thirty-seven of fifty (74%) received Alvimopan per protocol
- Median post-operative LOS for patients receiving Alvimopan was 7 days with 30% readmission rate, compared to 8 days and 27% with those who did not
- Other series with well-coordinated ERAS elements report post-operative LOS between 4-5 days, with a 21-31% readmission rate (Table 1)
- Twenty-nine of fifty-seven (51%) patients were pre-admitted for bowel preparation and IV hydration – leading to a full LOS of 8 days in our cohort
- Sixty percent of cases were performed robotically – there was a significantly lower rate of intra-operative transfusion (15 vs 96%), estimated blood loss (EBL; 776 vs 2,176 mL), and post-operative LOS (9 vs 7 days) as compared to the open group

Table 1. Comparison of contemporary C&D series with and without Alvimopan.

	TJUH	Lee et al.	Daneshmand et al.	Baack Kukreja et al.	Lee et al.	Baack Kukreja et al.
	With Alvimopan			Without Alvimopan		
Patients	37	143	110	79	134	121
Post-operative LOS (Median days)	7.0	7.0	4.0	5.0	8.0	8.0
Post-operative LOS (Mean days)	8.4	7.4	-	-	10.1	-
30-day Readmission Rate (%)	30	24	21	31	27	28
Patient Age (Years)	72.5	66	69	70	64	70
Conduit/Continent Diversion (%)	97/3	58/42	32/68	90/10	41/59	93/7
BMI	29	28	-	27.8	29	29.1
EBL (mL)	1317	726	-	500	888	700
Transfusion Rate (%)	46	38	-	-	33	-
OR Time (Hours)	8.6	5.8	-	7.2	5.8	6.8
Robot/Open	59/41	85/15	-	56/44	83/17	53/47

Table 2. C&D Demographics.

N	57
Mean Age (Years)	69.9
Male/Female	42/15
Mean ASA	2.96
Robotic/Open	34/23
Conduit/Neobladder	52/4
Alvimopan	37/50
Post-Operative LOS (Days)	8.33
Full LOS (Days)	8.96
30-Day Readmission (%)	14/57 (25%)
30-Day Mortality (%)	2/57 (2.5%)

Table 3. Demographics: Robotic vs. Open approaches.

	Robotic	Open
N	34	23
OR Time (Hours)	8.2	9.1
EBL (mL)	776	2,176
OR Transfusion	5/33 (15%)	22/23 (96%)
IVF (mL)	5,429	9,989
Full LOS (Days)	7.8	10.7
Post-Operative LOS (Days)	7.4	9.8
Pre-Admission Rate	11/34 (32%)	16/23 (70%)
30-Day Readmission	7/34 (21%)	7/23 (30%)

## Discussion

- Routine administration of peri-operative Alvimopan has a positive impact on LOS on patients undergoing C&D for treatment of bladder cancer
- Much room for improvement to equal LOS in other studies utilizing well-coordinated ERAS protocols
- Currently five surgeons performing C&D with significant practice variation, including routine pre-admission for bowel preparation and IV hydration
- Multiple studies for C&D patients show that omission of mechanical bowel preparation does not increase the rate of fascial dehiscence, anastomotic leak, surgical site infection or abdominal abscess
- Omitting mechanical bowel preparation has many benefits that will have a positive impact on LOS and can easily be implemented into existing protocols
- Further elements would include multi-modal, non-narcotic pain control (ketorolac, IV acetaminophen), judicious and goal-directed IV fluid administration, and aggressive diet advancement post-operatively (Figure 2)

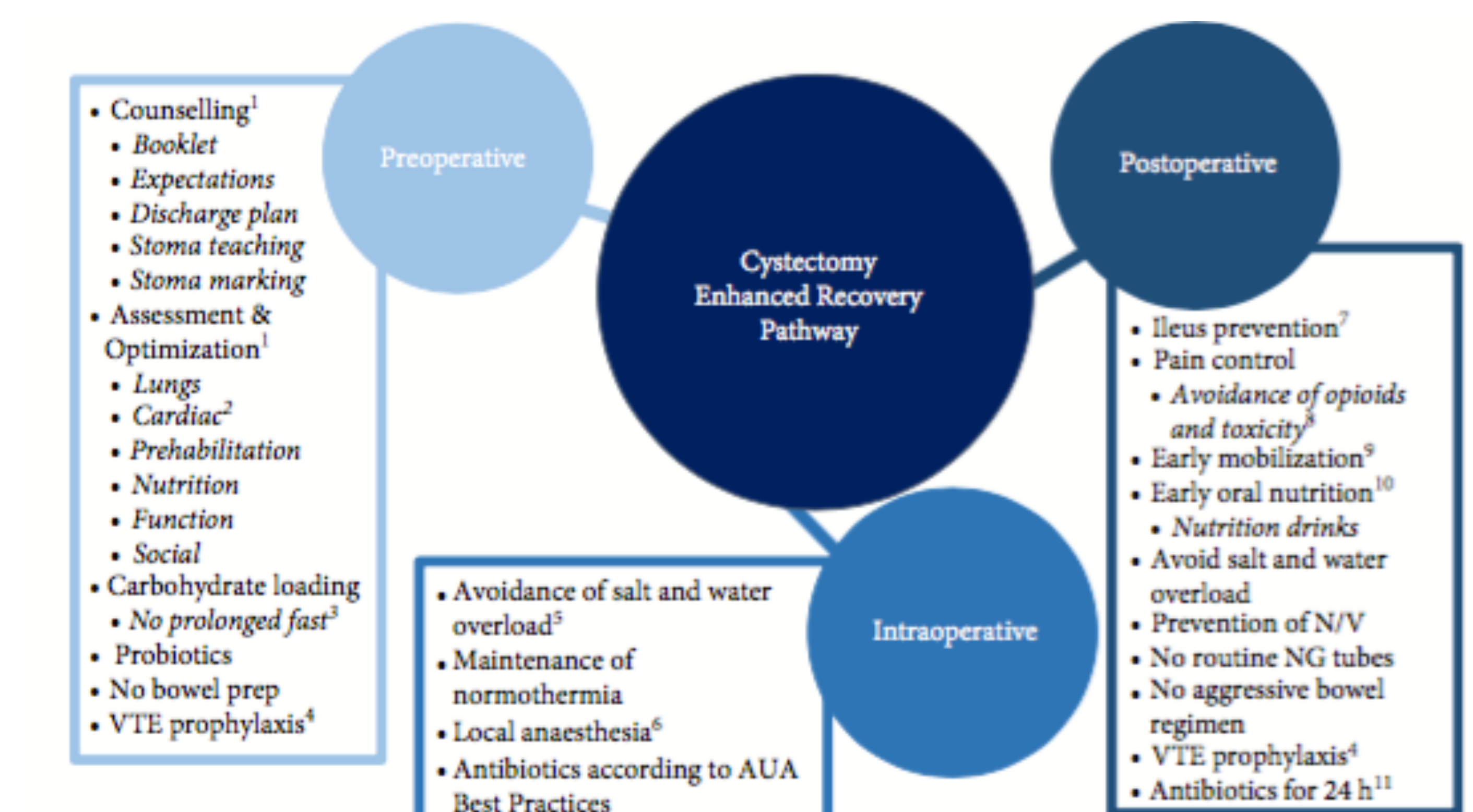


Figure 2. Common modalities applied to many ERAS protocols involving radical cystectomy patients.

## Conclusion

- Alvimopan resulted in decreased LOS by one day in our cohort
- Implementation of other ERAS elements appears to decrease LOS further
- Efforts underway to avoid routine bowel preparation, use high carbohydrate clear liquids pre-operatively, minimize narcotic use, decrease OR time