
# In-Hospital Predictors of Post-Discharge Opioid Utilization Following Radical Prostatectomy in the ORIOLES Initiative

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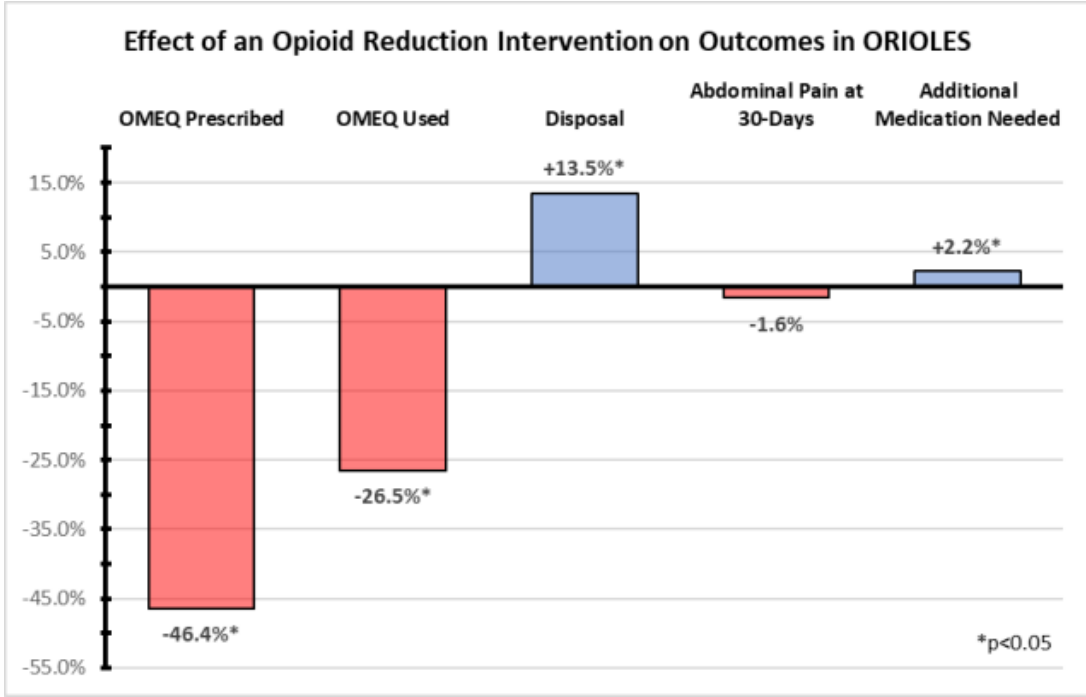
# Opioid Reduction Intervention for Open, Laparoscopic, and Endoscopic Surgery

- Need for judicious opioid stewardship by surgical prescribers
- ORIOLES initiative previously demonstrated:
  - No difference in opioid use between open and robotic RP approaches
  - Efficacy of opioid reduction intervention (discharge sheet, nursing education, standardized prescribing guideline)
- Goal in this study:
  - Identify baseline and in-hospital predictors of post discharge opioid utilization in RP patients
  - Develop a model to individualize prescribing




Patel, Eur Uro, 2019.
Patel, BJUI, 2020.

# Methods

- A prospective cohort of 443 patients who underwent open or robotic RP between August 2017 and November 2018
- Baseline demographics, clinical variables, patient-reported pain scores (scale 0-10), and inpatient and post-discharge pain medication utilization were tabulated via electronic medical records (EMR) and planned 30-day follow-up physician telephone calls.
- All opioid medications were converted to oral morphine equivalents (OMEQ).
- Predictive factors for individual total post-discharge opioid utilization were analyzed by univariable and multivariable linear regression adjusting for the opioid reduction intervention and baseline and perioperative parameters.
- A final multivariable model, which could be implemented via EMR or an online calculator, was constructed to guide individualized prescribing.

# Results

- 443 patients (102 open and 341 robotic RP)

- On univariable analysis, factors strongly associated with post-discharge opioid utilization (Table 1 & Figure 2):
  - Inpatient opioid utilization (overall, average per day, and 12 hours prior to discharge; Pearson's correlation coefficients $r=0.34\text{-}0.38$, $p<0.001$)
  - Maximum patient-reported pain scores (24 hours, 12 hours, and final score prior to discharge; $r=0.26\text{-}0.32$, $p<0.001$)
  - History of prior opioid use

- Inpatient administration of other pain medications were not correlated.

# Factors impacting post-discharge opioid use after RP

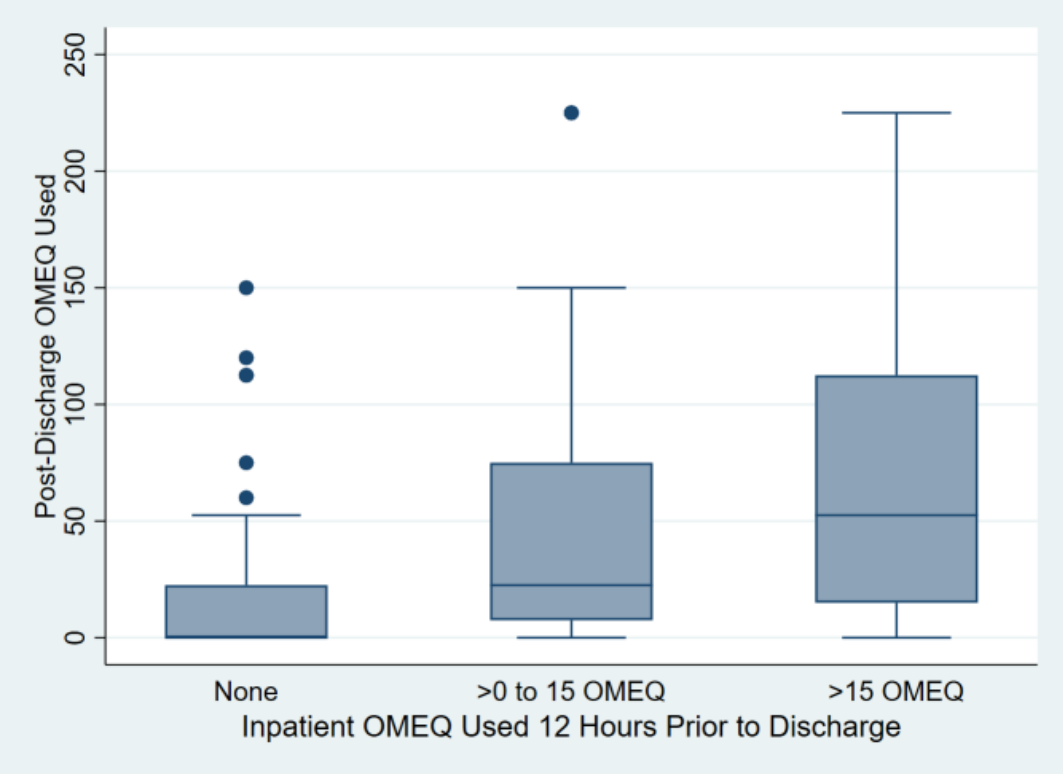
| Independent variable | | Univariable | | Multivariable[1] | |
|---|---|---|---|---|---|
| | | Coefficient [95% CI] | *P* -value | Coefficient [95% CI] | *P* -value |
| **Inpatient opioid used (OMEQ in last 12 hours)** | | 0.9 [0.7, 1.1] | <0.001* | **0.7 [0.4, 1.0]** | **<0.001*** |
| **Maximum inpatient pain score in last 12 hours** | | 9.2 [6.6, 11.7] | <0.001* | **5.5 [2.9, 8.0]** | **<0.001*** |
| **Study arm** | ***Pre-Intervention*** | *Referent* | | *Referent* | |
| | ***Post-Intervention*** | -13.8 [-25.7, -2.0] | 0.02* | **-14.4 [-25.2, -3.6]** | **0.01*** |
| **Age (years)** | | -0.2 [-1.1, 0.6] | 0.59 | 0.1 [-0.7, 0.9] | 0.82 |
| **Race** | ***Caucasian*** | *Referent* | | *Referent* | |
| | ***African-American*** | 20.5 [3.9, 37.2] | .02* | 11.8 [-3.2, 26.8] | 0.12 |
| | ***Hispanic*** | -1.8 [-43.9, 40.3] | 0.93 | 3.2 [-34.3, 40.8] | 0.87 |
| | ***Asian*** | -7.6 [-47.6, 32.4] | 0.71 | 3.9 [-31.7, 39.5] | 0.83 |
| **BMI ($kg/m^2$)** | | 1.5 [0.1, 2.9] | .04* | 1.1 [-0.2, 2.4] | 0.10 |
| **LOS (days)** | | 1.5 [-4.2, 7.3] | 0.60 | 2.6 [-2.8, 7.9] | 0.34 |
| **Inpatient PCA use** | | 14.7 [0.8, 28.6] | .04* | 0.7 [-15.4, 16.8] | 0.93 |
| **Inpatient ketorolac use** | | -9.3 [-21.7, 3.2] | 0.15 | -5.7 [-17.4, 6.1] | 0.34 |
| **Inpatient acetaminophen use** | | -6.5 [-41.7, 28.8] | 0.72 | 3.0 [-29.5, 35.5] | 0.86 |
| **Inpatient gabapentin use** | | 2.0 [-16.2, 20.2] | 0.83 | 0.9 [-15.6, 17.3] | 0.92 |
| **Prior pain diagnosis** | | 18.6 [4.3, 32.9] | .01* | 5.9 [-7.2, 19.1] | 0.38 |
| **Prior narcotic use** | | 177.7 [128.9, 226.4] | <0.001* | **147.7 [100.4, 195.0]** | **<0.001*** |
| **Surgery length (minutes)** | | 0.004 [-0.1, 0.1] | 0.94 | 0.1 [-0.04, 0.2] | 0.17 |

[1]Model also adjusted for discharge time of day and comorbidity (Charlson comorbidity index)

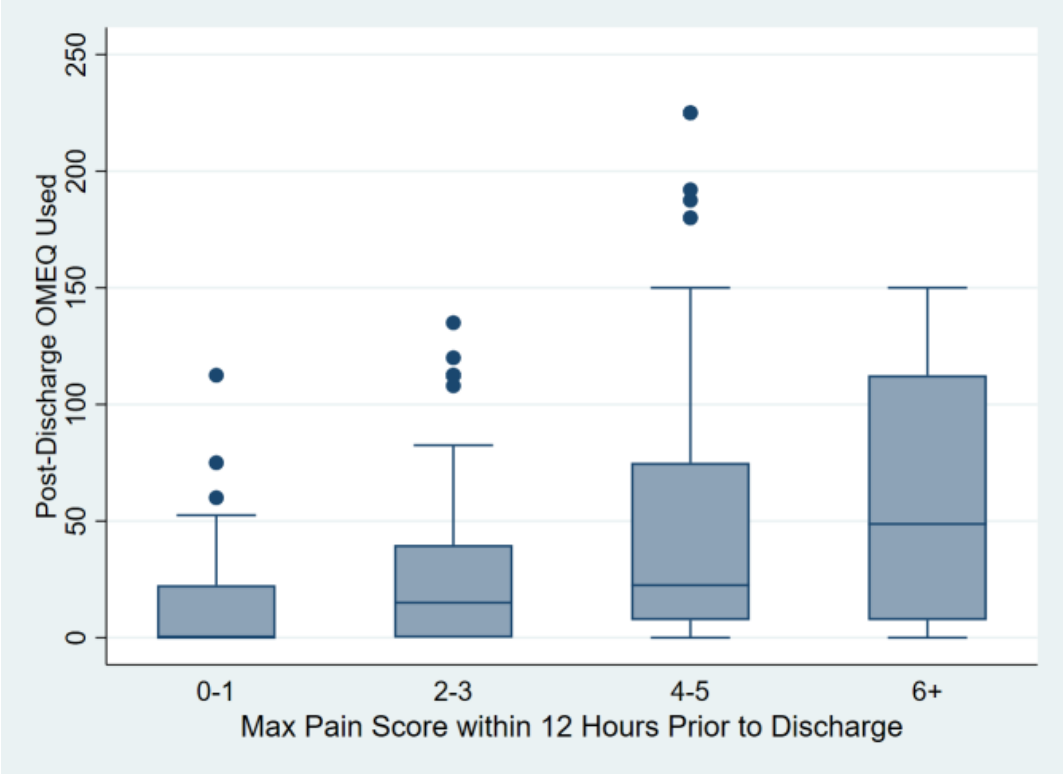
Abbreviations: 95%CI, 95% confidence interval; OMEQ, oral morphine equivalents in milligrams; BMI, body mass index; LOS, length of stay

# Distribution of post-discharge opioid utilization by:

**Inpatient OMEQ Use within 12 hours prior to discharge**




**Maximum Pain Score within 12 hours prior to discharge**



# Discharge recommendations based on in-hospital opioid use and pain scores

| In-Hospital Parameters | | Maximum Discharge Recommendation | Oxycodone 5mg Equivalents | Proportion Requiring None |
|---|---|---|---|---|
| **Inpatient Opioid Use in last 12 Hours** | **No Opioids Used** | 22.5 OMEQ | 3 | 60.2% |
| | **>0 to 15 OMEQ** | 75 OMEQ | 10 | 22.1% |
| | **>15 OMEQ** | 112.5 OMEQ | 15 | 14.1% |
| **Maximum Pain Score in last 12 Hours** | **0 to 1** | 22.5 OMEQ | 3 | 61.9% |
| | **2 to 3** | 45 OMEQ | 6 | 38.2% |
| | **4 to 5** | 90 OMEQ | 12 | 23.3% |
| | **6 or Greater** | 112.5 OMEQ | 15 | 18.4% |

# Conclusions

- Following radical prostatectomy, **in-hospital opioid use, patient-reported pain scores, and prior opioid use** are strongly correlated with post-discharge opioid utilization.

- A **multivariable model** based on these data can help **facilitate individualized opioid prescribing** at hospital discharge through an **EMR or online tool** to more reliably meet individual needs while minimizing risks of overprescribing.

- Similar **calculators** could easily be adapted and **generalized to other surgeries and institutions** based on EMR data and patient reported post-discharge use.

# Resources


- Patel HD, Srivastava A, Patel ND, et al. A Prospective Cohort Study of Postdischarge Opioid Practices After Radical Prostatectomy: The ORIOLES Initiative. Eur Urol. 2019 Feb;75(2):215-218.
- Koo K, Faisal F, Gupta N, et al. Recommendations for Opioid Prescribing after Endourological and Minimally Invasive Urological Surgery: An Expert Panel Consensus. J Urol. 2020 Jan;203(1):151-158.
- Patel HD, Faisal FA, Patel ND, et al. Effect of a prospective opioid reduction intervention on opioid prescribing and use after radical prostatectomy: results of the Opioid Reduction Intervention for Open, Laparoscopic, and Endoscopic Surgery (ORIOLES) Initiative. BJU Int. 2020 Mar;125(3):426-432.