Appropriate Opioid Prescribing for Acute Pain after Surgery

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Dartmouth
GEISEL SCHOOL OF
MEDICINE

The Opioid Epidemic: Introduction

Prescription opioid deaths quadrupled 2000-2017.

Opioid overdoses now leading cause of injury related deaths:

42,000 opioid overdose deaths in US 2016

37,000 motor vehicle crash deaths in US 2016

Opioid prescribing has also quadrupled in the past 15 years and is highly prevalent:

82.5 prescriptions per 100 persons per year

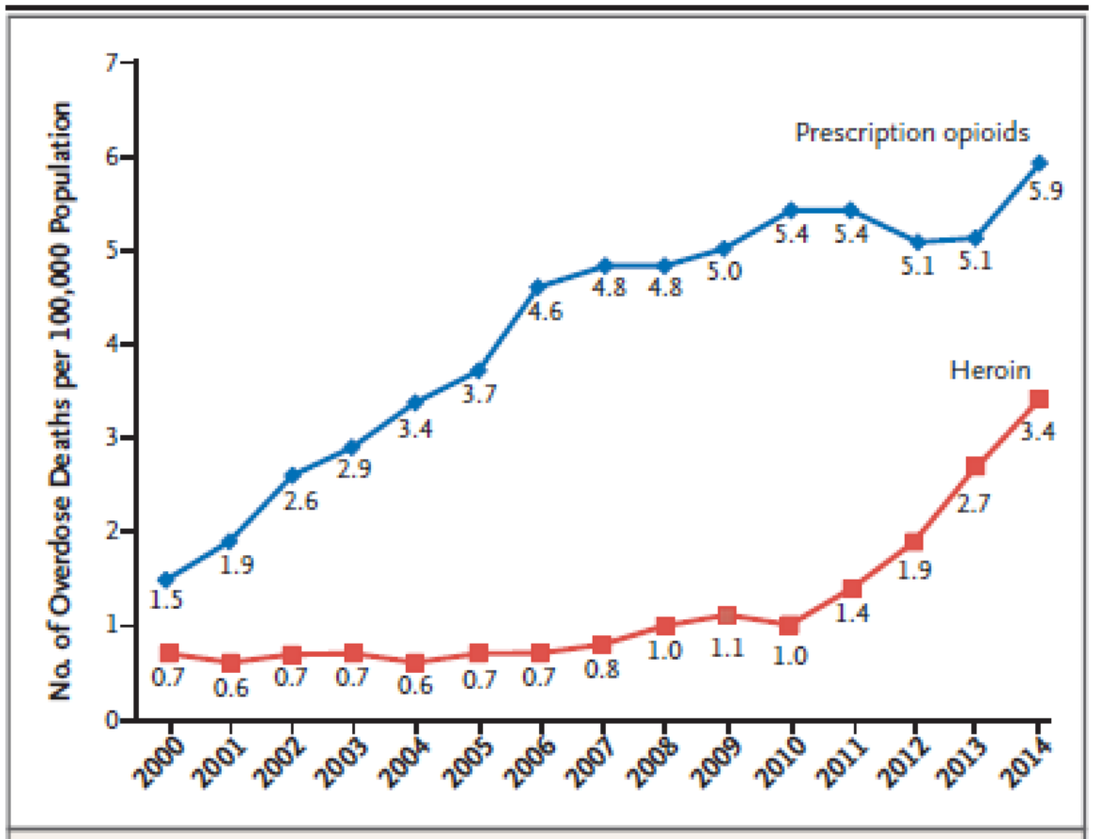


Figure 1. Age-Adjusted Rates of Death Related to Prescription Opioids and Heroin Drug Poisoning in the United States, 2000–2014.
Data are from the Centers for Disease Control and Prevention.[5]

Dart R. NEJM 2015; 372: 241
MMWR 2018 67: 349-58
https://crashstats.nhtsa.dot.gov

Link between increased opioid prescribing and increasing opioid overdose deaths…

- FDA: "***The crisis will continue unabated unless clinicians stop prescribing opioids far in excess of clinical need.***"

Califf R. NEJM 2016; 374: 1480

Surgeons play an important role in the opioid epidemic

Surgeons commonly prescribe opioids after surgery

Prescribing opioids for our patients has risks for them:

- 5-10% of opioid naïve patients become chronic users after prescribed opioids for surgery.

The pills our patients don’t use can be used by others:

- Diversion: 71% of users get drugs by diversion.

5-10% of opioid naïve patients become chronic users after prescribed opioids for surgery

Study	N	% chronic users	Definition
Alam 2012	390,000	7	On opioids 1 year after surgery
Deyo 2016	536,000	5	>5 refills subsequent year
Johnson 2016	59,000	13	New script 90-180 days after surgery
Brummet 2017	55,000	6	New script 90-180 days after surgery
Lee 2017	68,000	10	New script 90-180 days After surgery
Jiang 2017	79,000	9	On opioids 90 days after surgery
Shah 2017	1,295,000	5	On opioids 1 year after surgery

Initial prescription size matters…

A. Shah MMWR 2017; 66: 265-9

Studied 1,250,000 opioid naïve patients

- 1 day prescription: 6% chance on opioids @ 1 year
- 8 + day prescription: 13% chance on opioids @ 1 year

PREVENT long term use by right-sizing initial opioid prescription

Literature Review: 2015

Few studies exist that address optimal post-operative opioid prescriptions

- Urologic, oral, hand, and upper extremity surgery

No studies looking at best prescribing practices in general surgery

J Urology. 2011. 185: 551-555
J Oral Maxillofac Surg 71:1500-1503, 2013
J Hand Surg Am. 2012;37A:645–650
J Hand Surg Am. 2015;40(2):341e346

Bates C, Laciak R, Southwick A and Bishoff J. Overprescription of postoperative narcotics: a look at postoperative pain medication delivery, consumption and disposal in urological practice *J. Urol* 2011; 185: 551.

275 patients Univ Utah responded phone or letter survey opioid consumption

90% given an opioid prescription

Mean number pills prescribed: 25

Only about half of prescribed opioids were consumed.

2/3 patients had opioids left over

Only 8% of patients were given instructions on how to dispose of leftover meds

Stopped short of recommending opioid prescription guidelines

SPECIAL SERIES

Wide Variation and Excessive Dosage of Opioid Prescriptions for Common General Surgical Procedures

Maureen V. Hill, MD, Michelle L. McMahon, BS,† Ryland S. Stucke, MD,* and Richard J. Barth Jr., MD**

Ann Surg 2017, 265: 709-14

ORIGINAL ARTICLE

An Educational Intervention Decreases Opioid Prescribing After General Surgical Operations

Maureen V. Hill, MD, Ryland S. Stucke, MD,* Michelle L. McMahon, BS,† Julia L. Beeman, BS,* and Richard J. Barth Jr., MD**

Ann Surg 2017, 267: 468-72

NEW ENGLAND SURGICAL SOCIETY ARTICLE

Guideline for Discharge Opioid Prescriptions after Inpatient General Surgical Procedures

Maureen V Hill, MD, Ryland S Stucke, MD, Sarah E Billmeier, MD, MPH, Julia L Kelly, MS, Richard J Barth Jr, MD, FACS

J Am Col Surg, 2018, 226: 996-1003

Methods

- The 5 most common outpatient procedures performed June-Dec 2015:

  partial mastectomy, partial mastectomy with sentinel lymph node biopsy, laparoscopic cholecystectomy, laparoscopic inguinal hernia repair, open inguinal hernia repair

- Post-operative opioid prescription data and opioid refill data were obtained

- Patients with recent opioid use, history of opioid abuse, and those with post-operative complications were excluded

- We called patients and asked them how many opioids they took.

Cases Performed and Analyzed

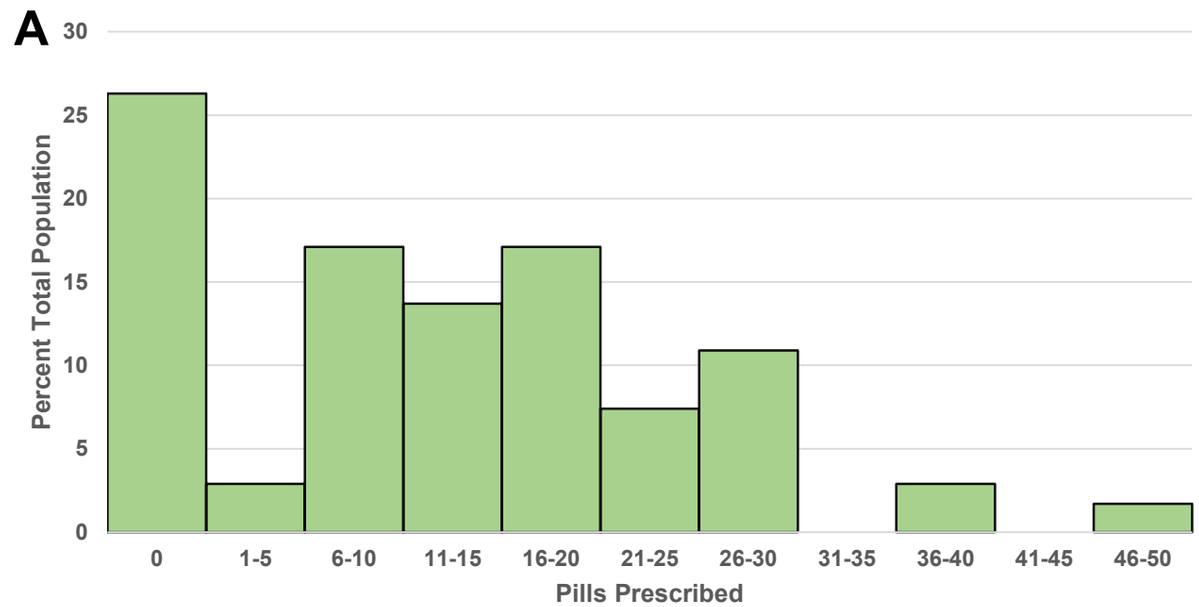
	Partial Mastectomy	Partial Mastectomy with Sentinel Lymph Node	Laparoscopic Cholecystectomy	Laparoscopic Inguinal Hernia Repair	Open Unilateral Inguinal Hernia Repair	ALL CASES
Cases Performed	183	112	240	80	85	700
Number Patients Excluded	8	8	32	4	6	58 (8%)
Chronic opioid use/ abuse	2	5	24	3	4	38 (5%)
Complications	6	3	6	1	2	18 (3%)
Patients Analyzed	**175**	**104**	**208**	**76**	**79**	**642**

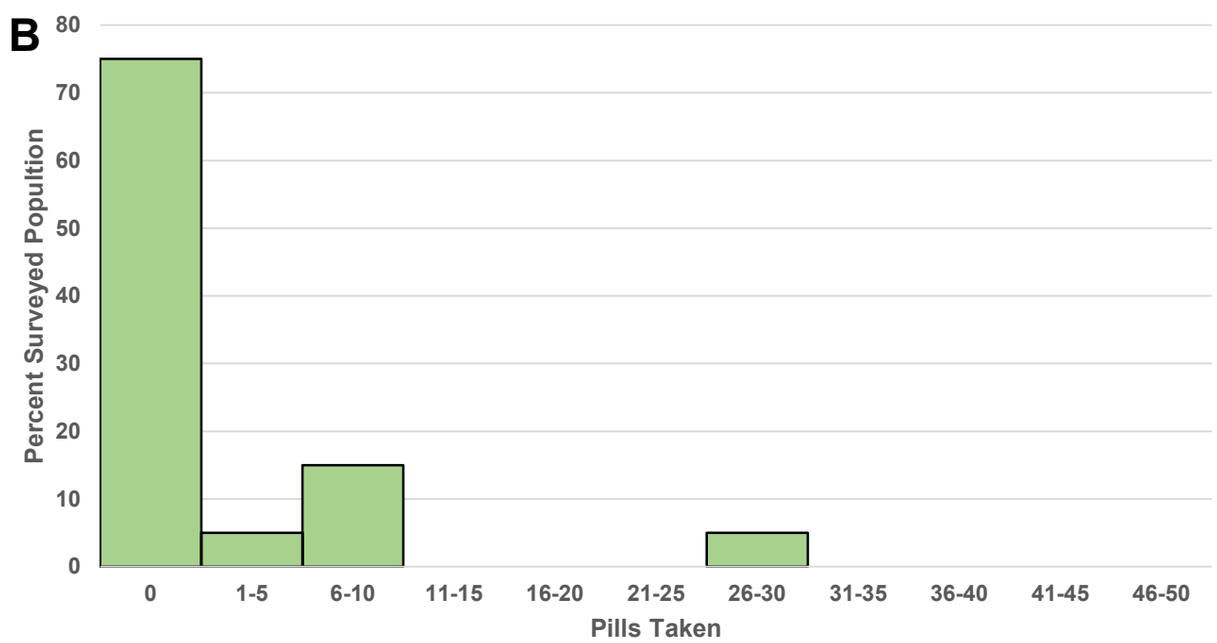
Opioid Prescriptions

	PM (175)	PM SLNB (104)	LC (208)	LIH (76)	IH (79)
Patients Receiving Opioid Prescription	129 (73.7%)	92 (88.5%)	205 (98.6%)	76 (100%)	79 (100%)
Opioid Pills Prescribed					
Mean	19.8	23.7	35.2	33.8	33.2
Median	20	20	30	30	30
Range	0-50	0-60	0-100	15-70	15-120

Frequency of opioids prescribed (A) and taken (B) after partial mastectomy

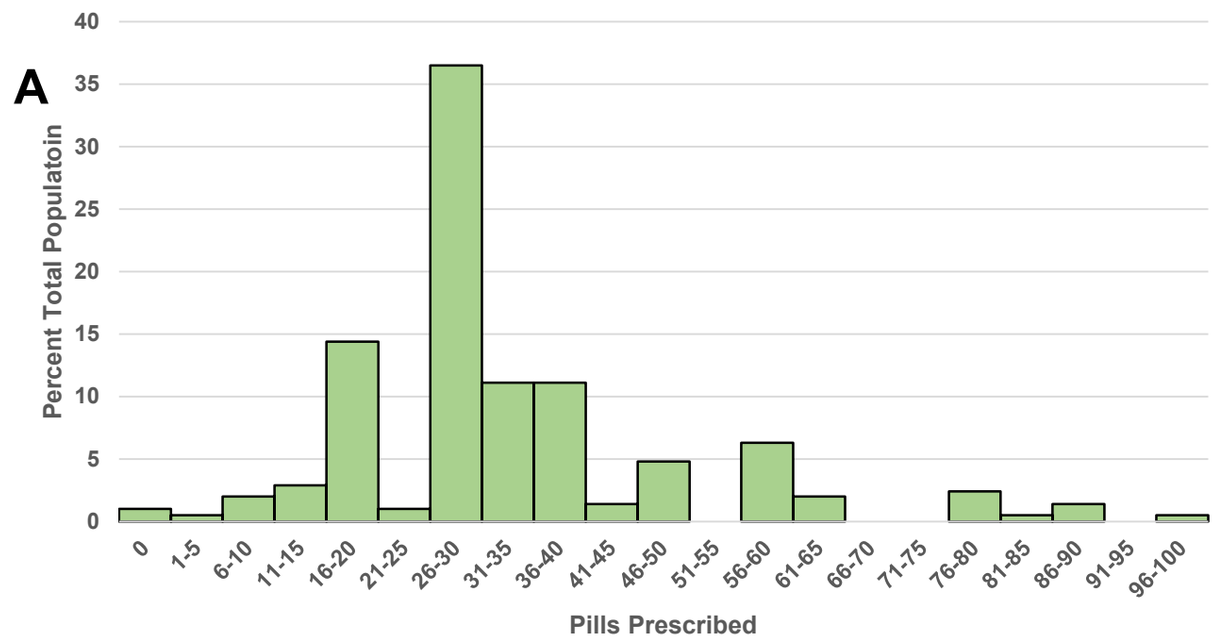
N=175
Median= 20
Range= 0-50

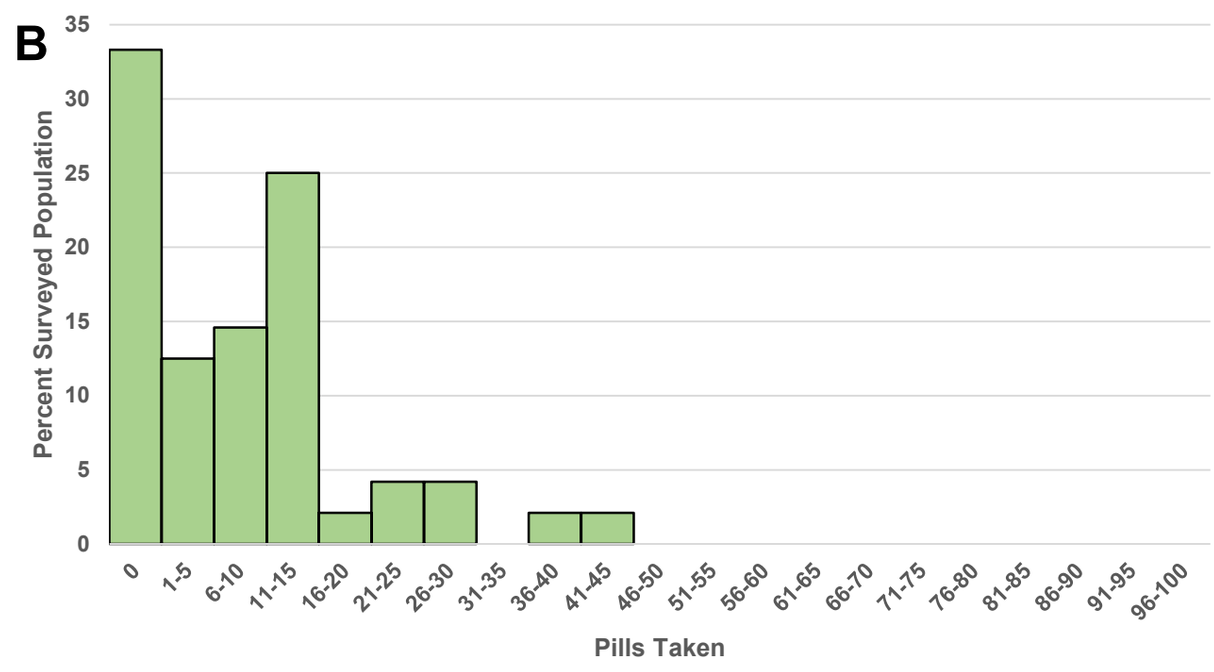




Frequency of opioids prescribed (A) and taken (B) after laparoscopic cholecystectomy

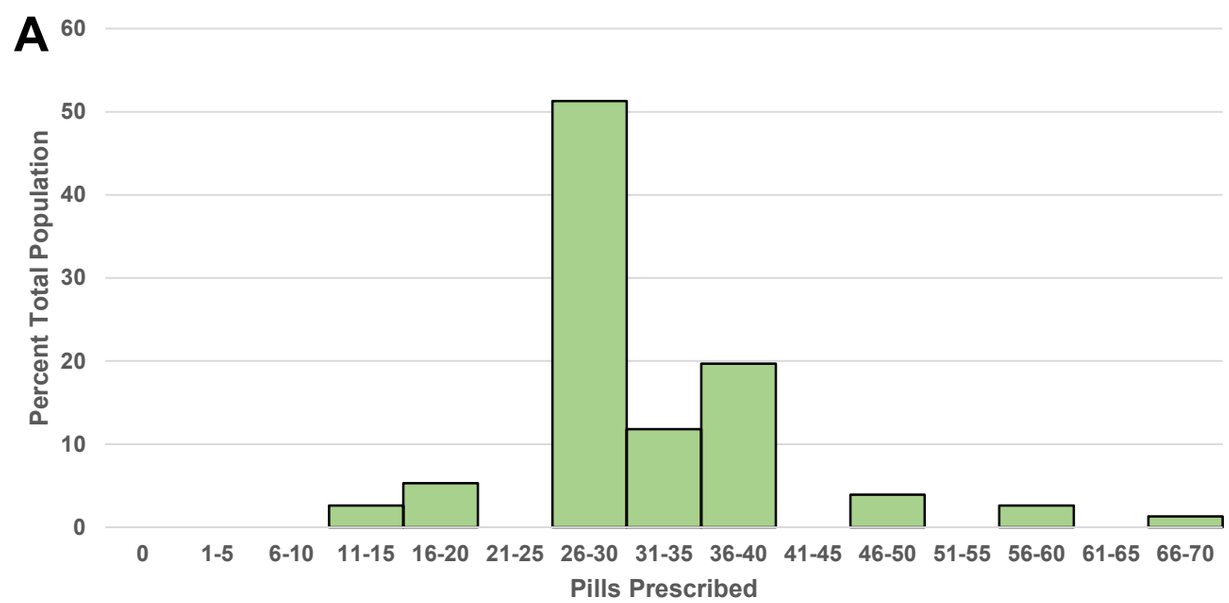
N=208
Median= 30
Range= 0-100

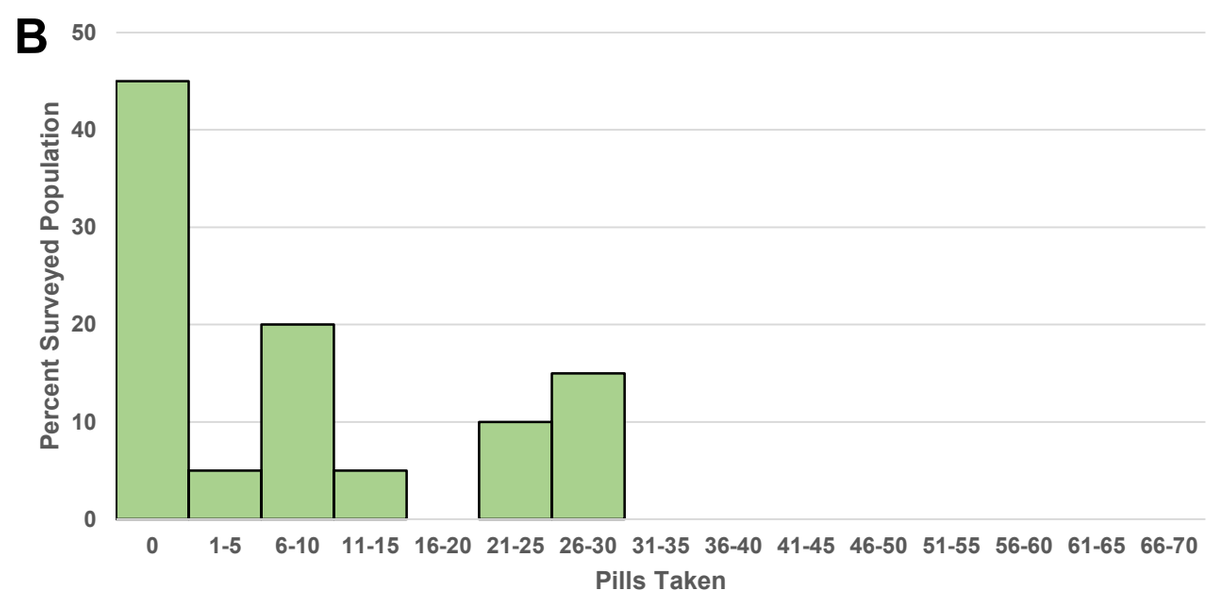




Frequency of opioids prescribed (A) and taken (B) after laparoscopic inguinal hernia repair

N=76
Median= 30
Range= 15-70





Home Opioid Use Summary:

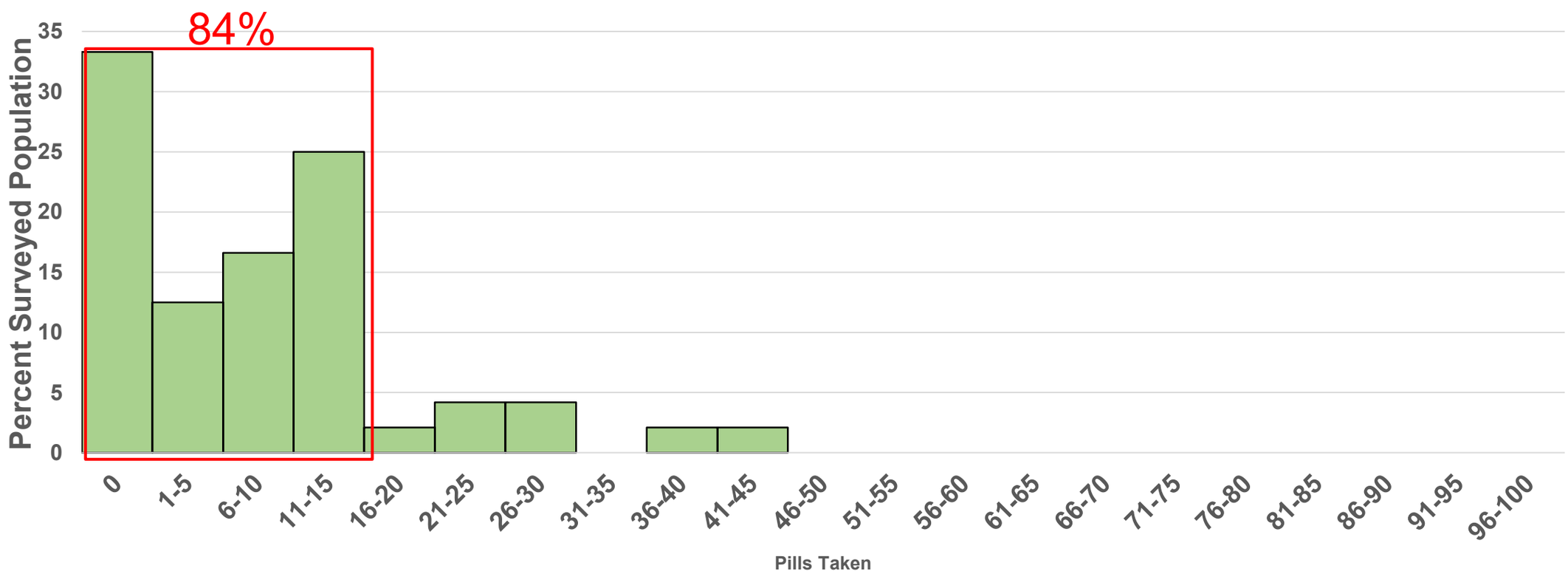
Only ¼ of pills were taken!

Since our publication, several groups have described overprescribing:

1. Dartmouth orthopedics. *Sabatino J Bone Jt Surg 2018; 100:180*
2. Mayo Clinic mult. ops, incl. nephrect, prost *Thiels Ann Surg 2018; 268: 457*
3. Michigan, cholecystectomy. *Howard JAMA Surg 2018 153:285*
4. UVM, several operations, including vasectomy and robotic prostatectomy. *Fujii M et al JACS 2018 226:1004*

“Ideal” Number of Pills

Calculated for each case by determining the number of pills that would fulfill the opioid use of > 80% of the patients



	PM	PM SLNB	LC	LIH	IH
Ideal # pills	5	10	15	15	15
Median # pills actually prescribed	20	20	30	30	30

57% decrease

Effect of provider education intervention

- We presented opioid use data and these guidelines at General Surgery section meeting, sent emails, resident teaching session April, May 2016

- Recommended use acetaminophen **and** ibuprofen first, then opioids

- *What % of pts will have 50% reduction in pain for 6 hours (Cochrane)?*

  Ibuprofen and acetaminophen: 73% *ibuprofen alone: 52%*
  Oxycodone: 23% *placebo: 17%*

- Observed opioid prescribing patterns same 5 outpatient operations, June-September 2016, 224 patients

- Collected data on opioid use

Comparison of opioid prescriptions pre vs post provider education

		Mean number of opioid pills prescribed (SD)			Median number of opioid pills prescribed		Range	
Operation		Pre	Post	p-value	Pre	Post	Pre	Post
PM		19.8	5.1	0.0001	20	5	0-50	0-20
PM SLNB		23.7	9.6	0.0001	20	10	0-60	5-15
LC		35.2	19.4	0.0001	30	15	0-100	0-40
LIH		33.8	19.3	0.0001	30	15	15-70	0-30
IH		33.2	18.3	0.0003	30	15	15-120	0-40

Effect of education intervention on total number of opioid pills actually prescribed

53% decrease !

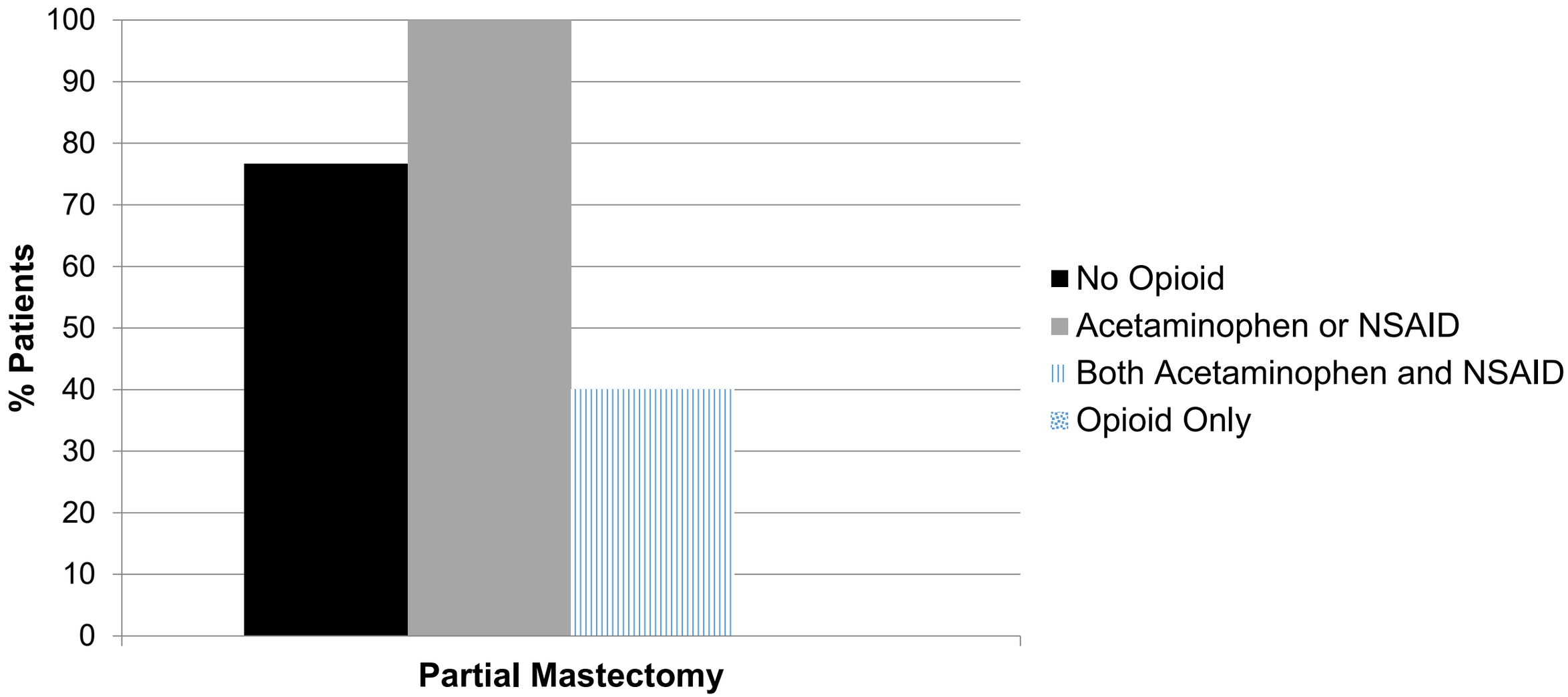
Were patient's pain medication needs met?

Of 224 patients,

- Only 34% of the prescribed opioids were taken.
- Only 1 patient (<0.5%) required an opioid refill.

Answer: YES!

Analgesic use after partial mastectomy



How many opioids should be prescribed to patients who are discharged after surgery which requires an *inpatient* admission?

Laws limiting number of pills prescribed to a “7 day supply”

Ambiguity:
Is a 7 day supply 21 pills (1 every 6 hrs while awake) or 84 (2 every 4 hrs)?
Do you assume the patients will use less pills every day?
Is 7 days the right number, or 5, or 10?

Methods

Six common inpatient operations July –Dec, 2016:

Studied 333 patients

Excluded patients chronic opioid use, complications, discharged to nursing facility

85% sent home with opioid prescription

Analysis Groups

DC on POD =1

↓

Home opioid use

DC on POD ≥2

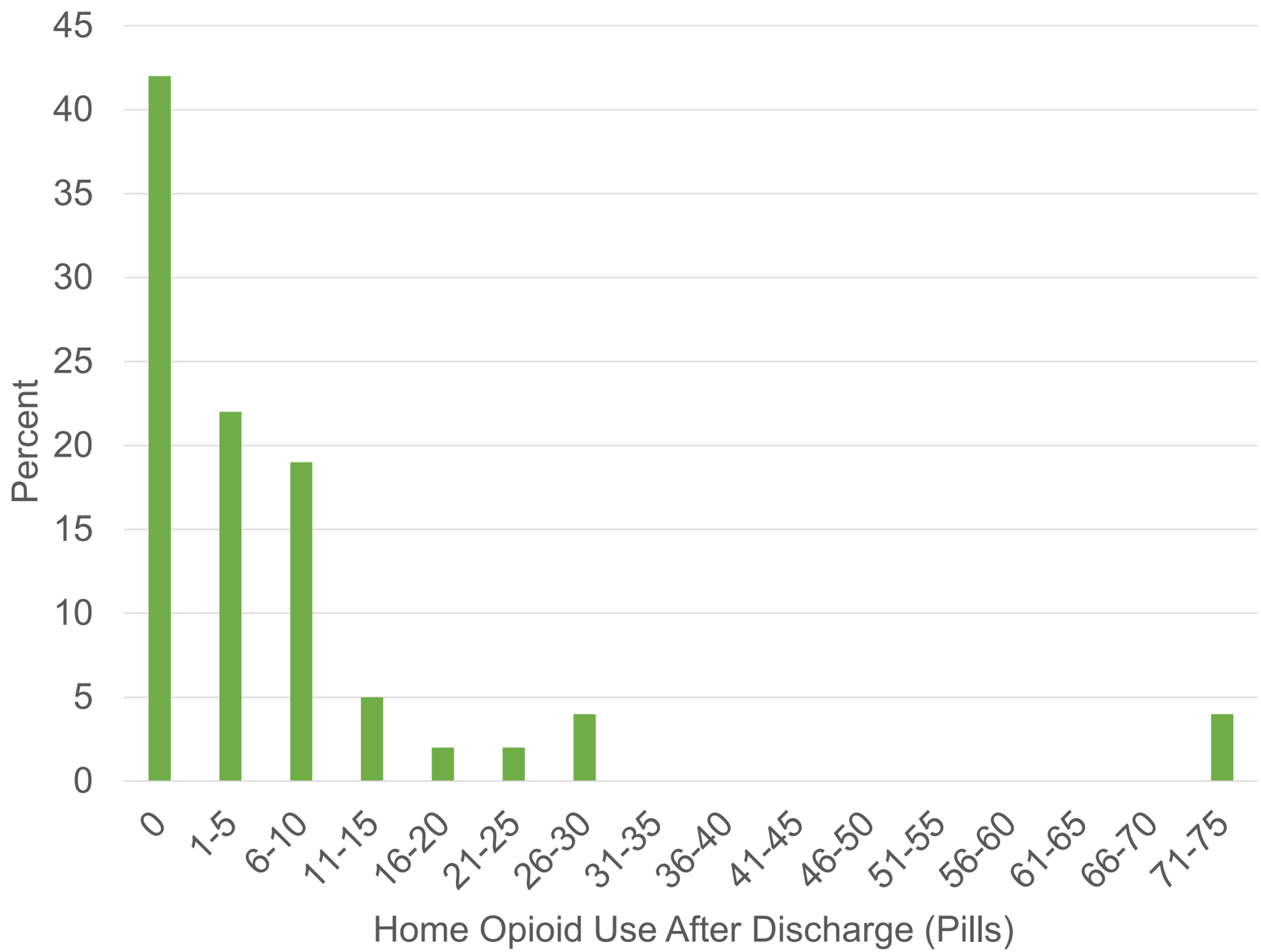
↓

Inpatient use on day prior to discharge

↓

Home opioid use

Home opioid use for patients discharged on POD 1



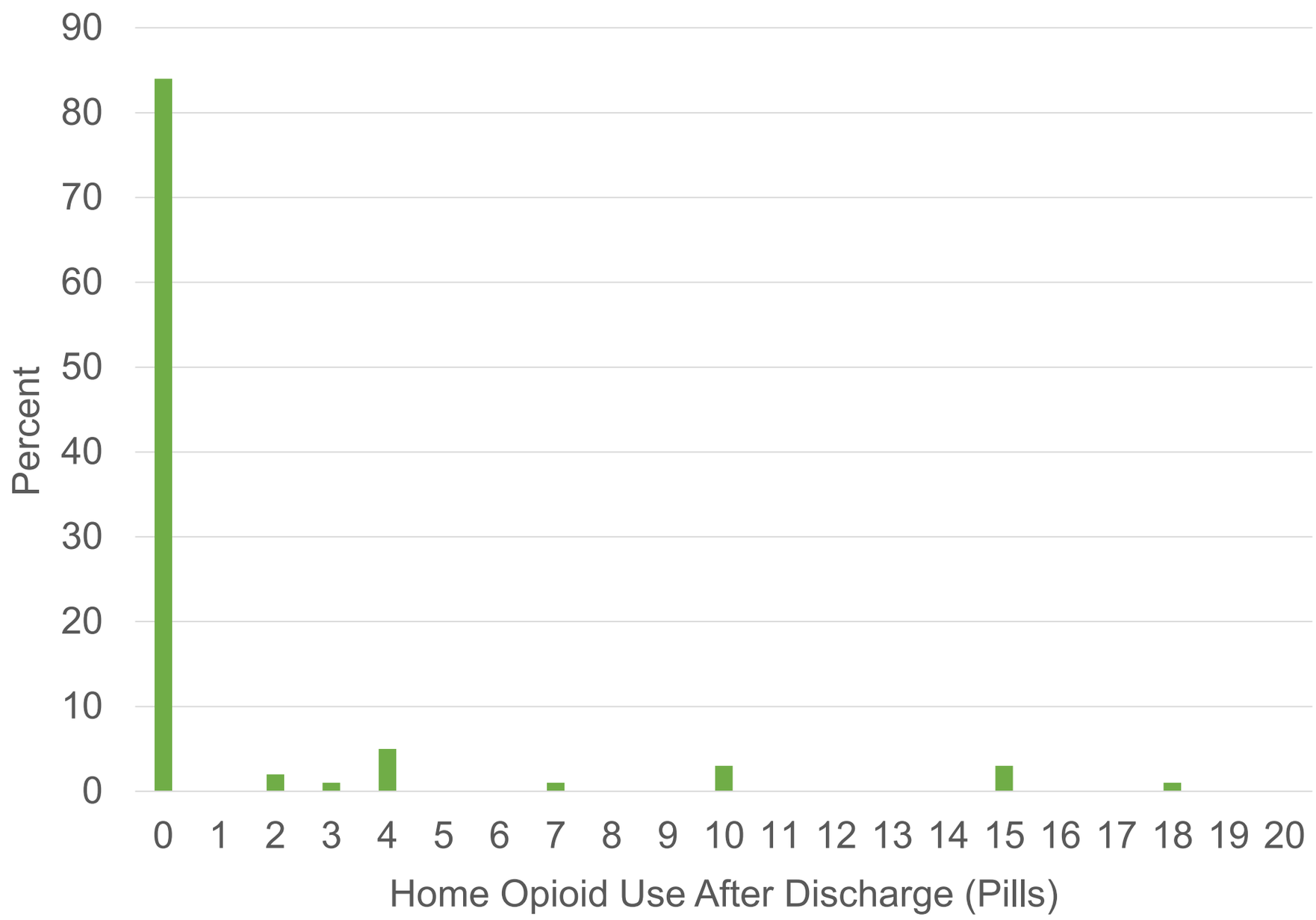
Univariate and multivariate analysis of factors associated with home opioid use

We found:

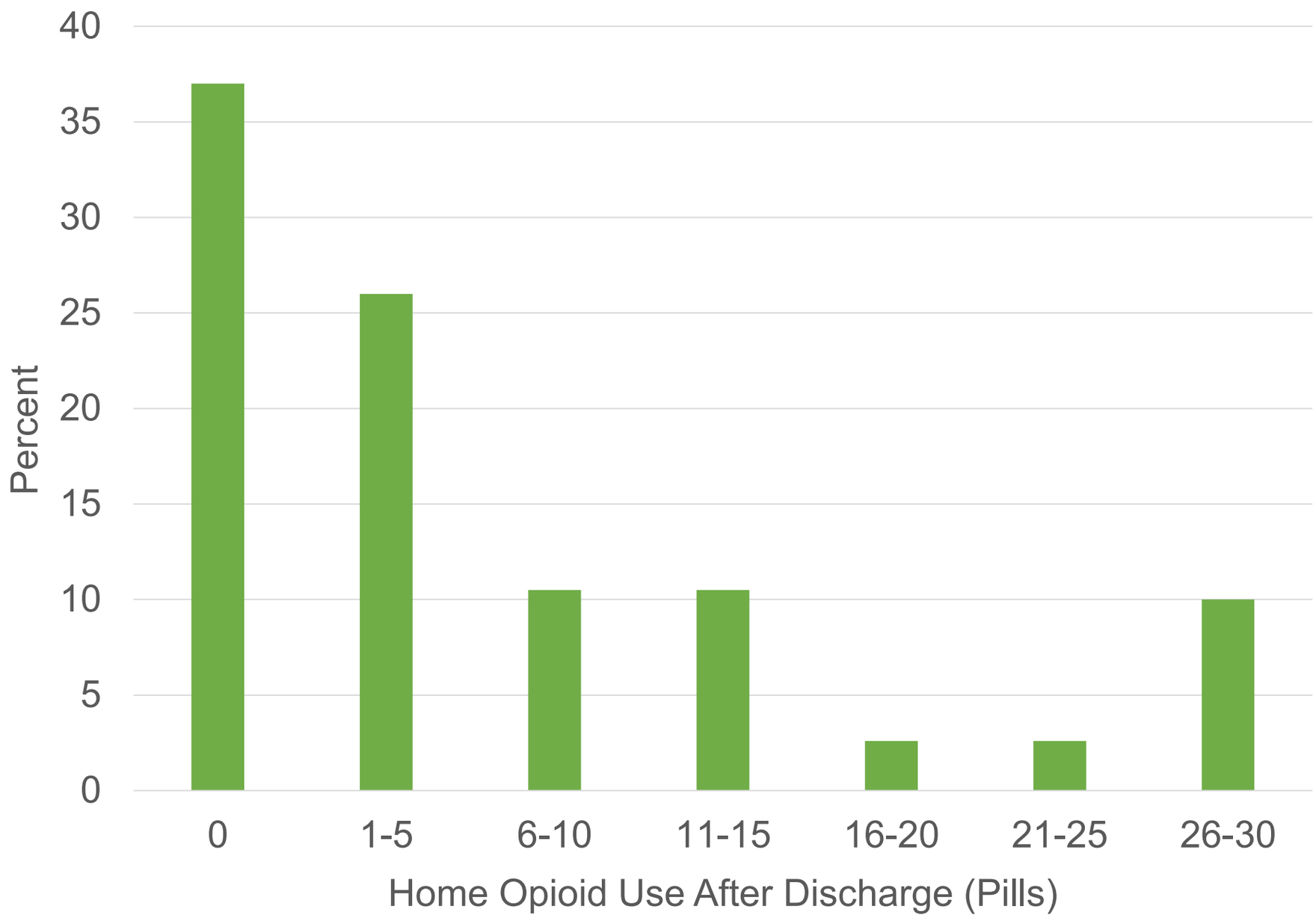
1) The number of pills taken the day prior to discharge was the best predictor of how many opioids were used at home

2) Opioid use at home after inpatient admission was independent of the operation performed

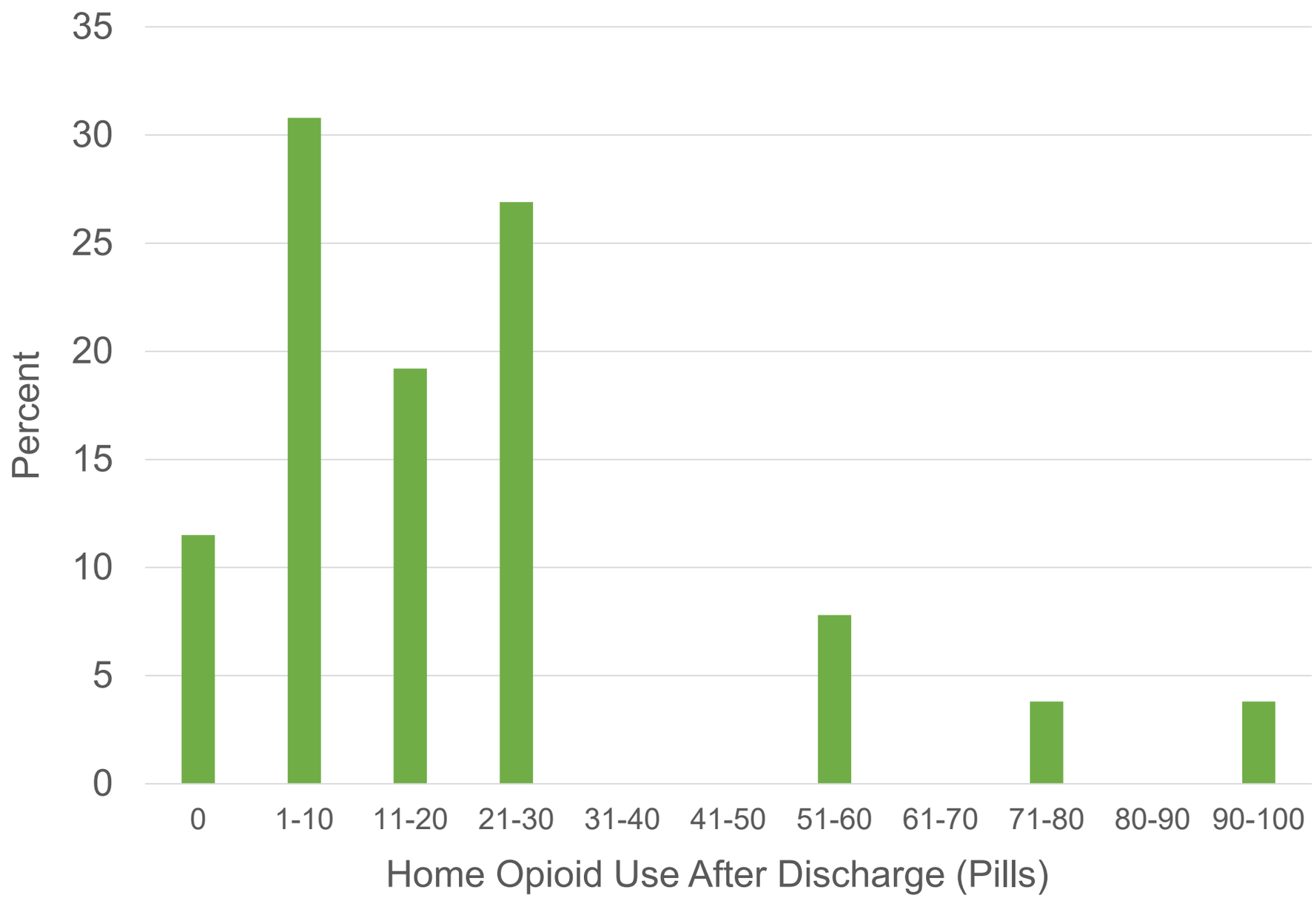
No opioid pills taken day prior to discharge



1-3 opioid pills taken on day prior to discharge



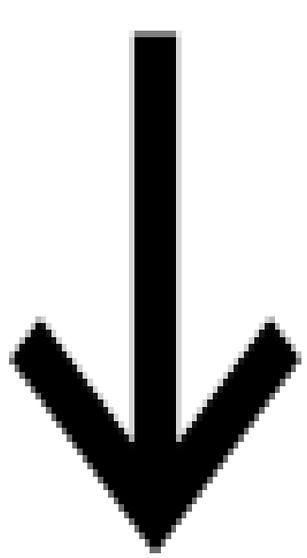
≥ 4 opioid pills taken day prior to discharge



Prescription guidelines to satisfy 85% of patients' home opioid usage

Discharge Date	Number to Prescribe
POD =1	**15**
POD ≥2	
Pills used on day prior to DC	
0 pills	**0**
1-3 pills	**15**
≥4 pills	**30**

Potential Savings in Opioid Pills Prescribed if our Guidelines were Used



40%

So, how many opioids should I prescribe to my next urology patient ?

1. You could use our guideline based on the number they used the day before discharge. (1 pill = 5 mg oxycodone)

Pills used day prior to discharge	# Pills to prescribe
0	0
1-3	15
≥4	30

Hill, Stucke, Billmeier, Kelly, Barth. JACS 2018; 226: 996-1003

So, how many opioids should I prescribe to my next urology patient ?

2. You could base it on operation specific consumption after discharge (Mayo guideline: http://links.lww.com?SLA/B477)

		# of 5 mg oxycodone pills		
	N	Median	IQR (range)	Guideline
MIS prostatectomy	105	4	0-15	15
Robotic prostatectomy	17	4	(0-20)	15
MIS nephrectomy	100	6	0-20	20
Vasectomy	11	0	(0-2)	0
Endoscopy	29	0	(0-10)	5

Mayo Guideline: 80% of the IQR for opioid naïve pts

Thiels C et al Ann Surg 2018; 268: 457-68
Fujii M et al JACS 2018; 226: 1004-1012

Potential Barrier to Surgeons Prescribing Less Opioids: Concern about Patient Satisfaction Scores

"Hawkeye" Pierce, MD
General Surgery
Areas of Focus

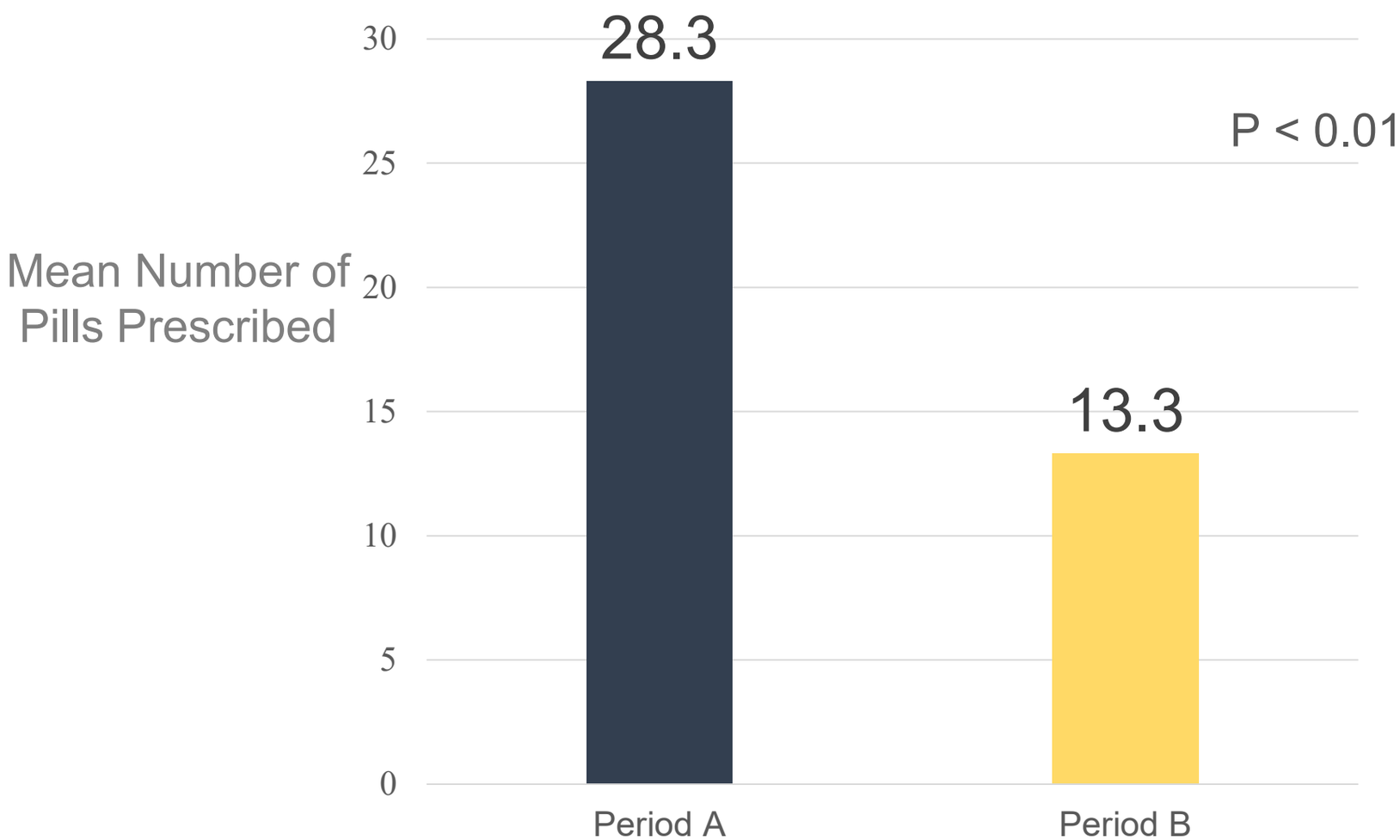
- Trauma surgery
- Hernia repair
- Surgical critical care

Patient comments

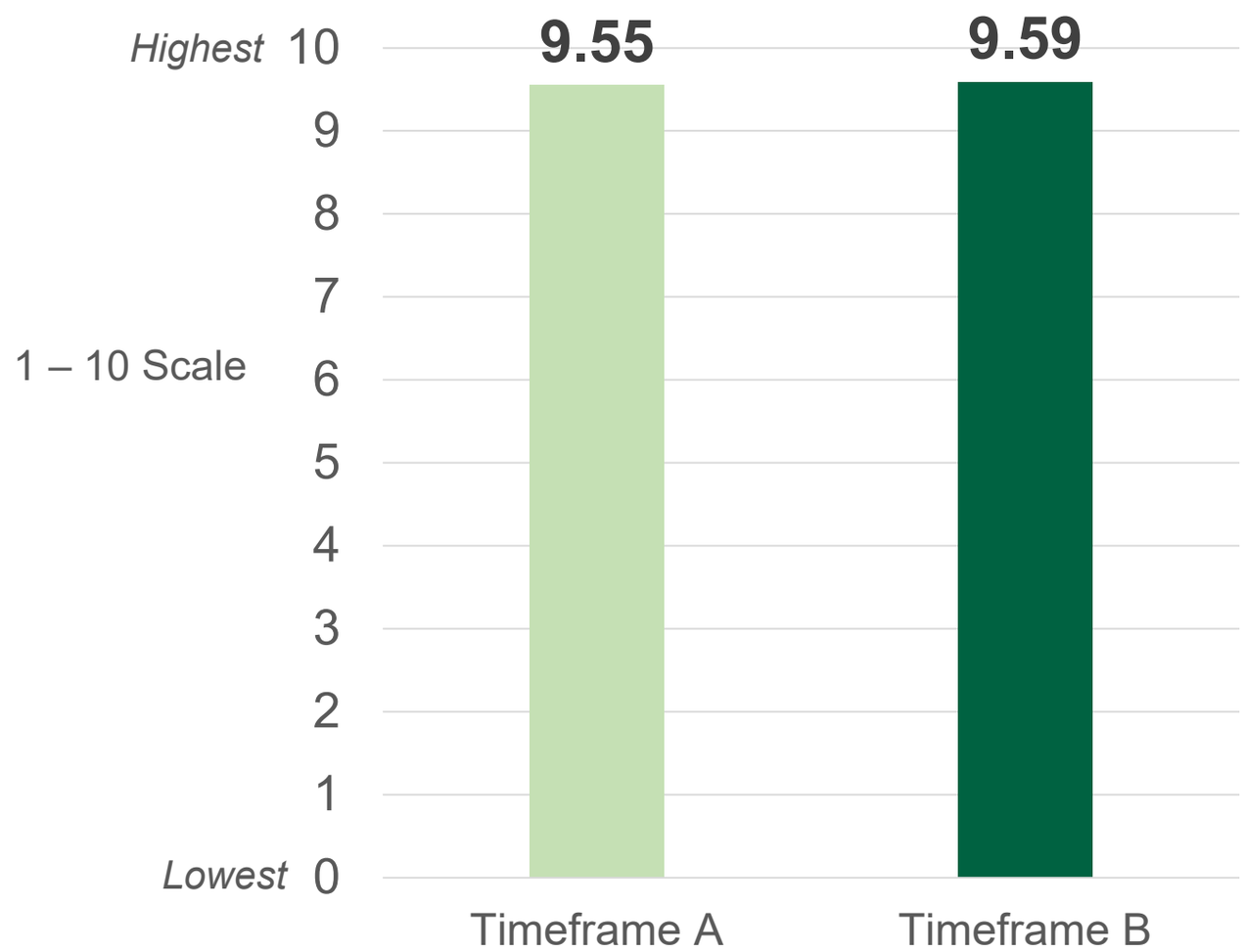
Dr. Pierce had a great sense of humor but he didn't give me enough pain medicine after my operation.

Dartmouth-Hitchcock

Fewer Opioid Pills Prescribed



Overall Provider Satisfaction From All Patients (Index Plus Other cases) Throughout Study Period, N = 640



P = 0.62

N =	236	404

What happens to excess pills?

<u>FDA approved disposal:</u>

- First DH outpatient study: 9%
- Our Inpatient study 1 year later: 19%
- Prospective study of pt info: 20%*

Take Back Days

Hasak J et al JACS 2018 226: 235-40.

Next Steps…..excess pills problem

- Prospective study at Dartmouth to determine whether calling patients prior to their appointment after surgery increases use of an opioid drop-box in the pharmacy
  - Will appropriate opioid prescribing and disposal decrease the % of patients using opioids one year after surgery?
- Applied for funding with U Michigan and others to prospectively study the use of a charcoal inactivation system (Deterra) to inactivate excess pills

Some good news……

- In 2017 the number of opioid pills prescribed nationally decreased by 9%.

- New Hampshire was the top state in the nation, with a 15.1% decrease in opioid prescriptions.

Dartmouth-Hitchcock