

Retrospective Chart Review for Local Anesthetic Administration Exceeding Maximum Weight Based Dose



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Background

- 1,089 elective, non joint replacement orthopedic surgeries performed annually at Albany Medical Center.
- Local anesthesia is: A standard treatment modality used to manage perioperative surgical pain
- Frequently administered via:
 - spinal anesthesia
 - peripheral nerve block
 - intraoperative injection
- Mechanism of Action: reversibly binds to the sodium channels in the nerve axon, blocking the conduction of the pain signal producing anesthesia and analgesia.²

Purpose

- Determine how often patients undergoing orthopedic surgery at Albany Medical Center receive a local anesthetic dosage exceeding their maximum dosage based on their body weight

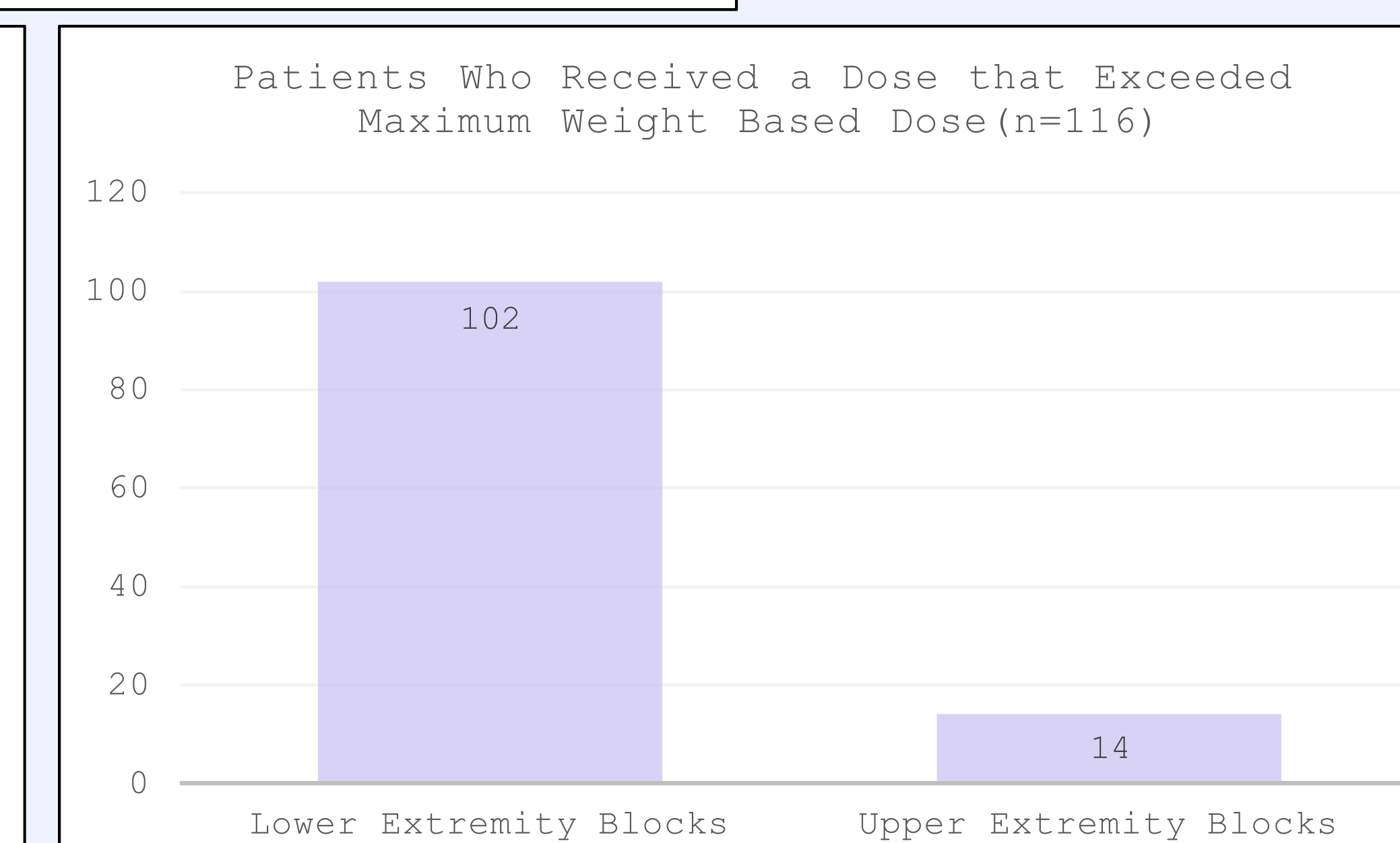
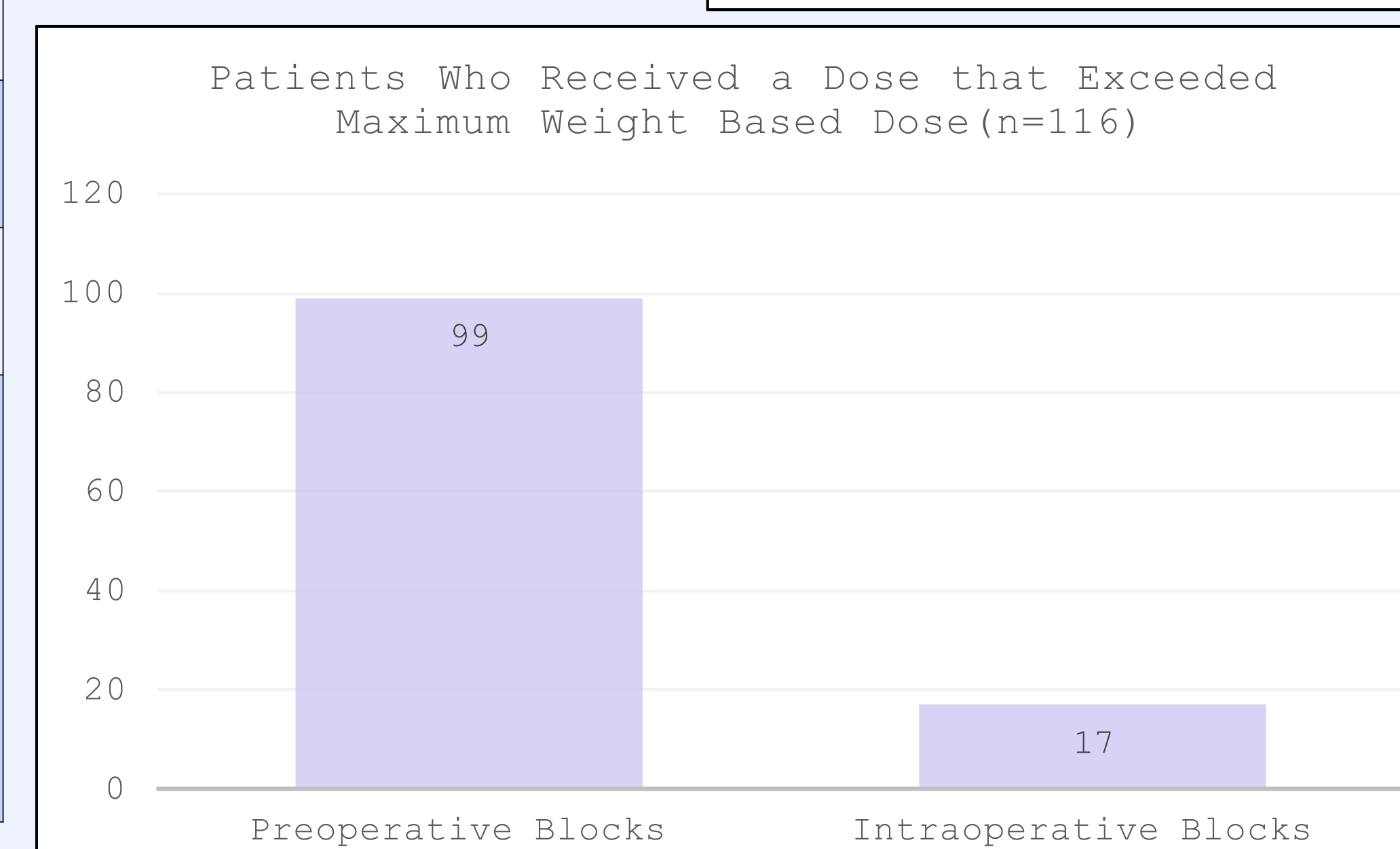
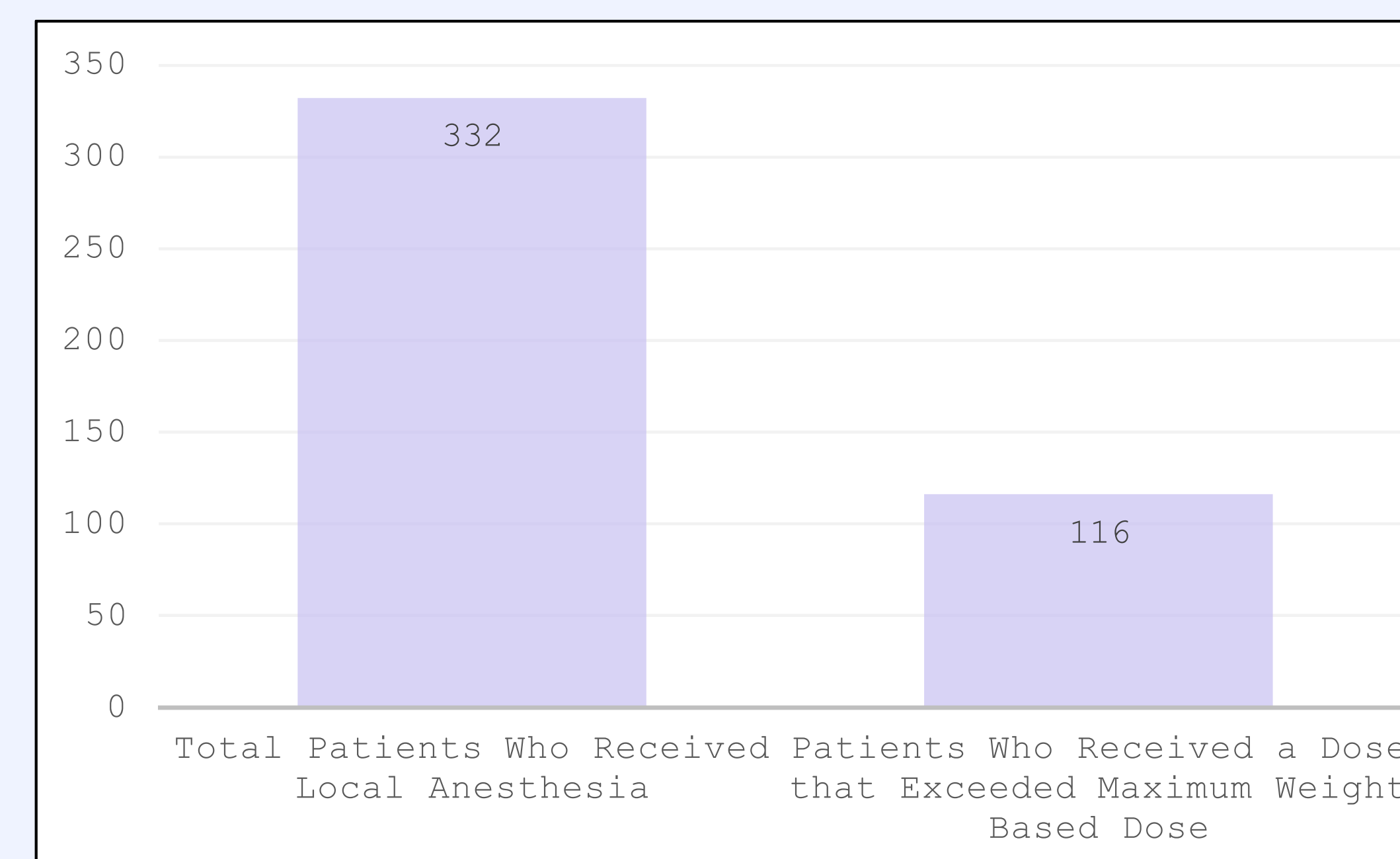
Methods

Study Design	Retrospective Chart Review
Subjects	Patients 18 and older, orthopedic surgery, local anesthesia given
Data Collection Period	April 2024-May 2024
Sample Size	332
Data Collected	MRN, Weight, Age, Gender, Surgery performed, Blocks performed, Local administered, Time of preop and intra-operative blocks

Local Anesthetic and Concentration	Toxic Dose (mg/kg)	Maximum Dose (mg)
Bupivacaine (0.25%,0.5%,0.75%) plain	2 mg/kg	175 mg
Bupivacaine 0.25% with epinephrine	3 mg/kg	225 mg
Mepivacaine (1%, 1.5%, 2%)	4.5 mg/kg	400 mg
Lidocaine (1%, 2%)	4.5 mg/kg	300 mg
Ropivacaine (0.2%, 0.5%, 1%)	3 mg/kg	200 mg
Chloroprocaine (3%)	12 mg/kg	800 mg

Results

- Power analysis determined that sufficient sample size = 164 patients
- 34.9 % of patients received a dose of local anesthetic exceeding their maximum weight based dose
- 85.3 % of patients exceeded their maximum weight based dose preoperatively
- 87.9% of patients who exceeded their maximum weight dosing received a lower extremity block
- 12% of patients who exceeded their maximum weight dosing received an upper extremity block



Discussion

- Exceeding maximum weight based dosing of local anesthetics is avoidable
- Strategies to prevent exceeding maximum weight based dose of local anesthetic
 - Individualize local anesthesia dose to patient weight
 - Perform local anesthesia time out announcing patient weight, local anesthesia used, maximum dose allowed per patient body weight

Limitations

- Missing data- Block reported, dose of local anesthesia not documented or incorrect
- Dose of local anesthesia documented in block note and medication administered in MAR do not always match

Future Research

- Incidence of adverse effects to Local Anesthesia Systemic Toxicity at Albany Medical Center
- Implementation of a local anesthesia time out to determine if number of local anesthesia overdoses decreases

References

