Wild Wild West Exploration: Approaching the Perioperative Setting to Address Safety Concerns

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Disclosure

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Objectives

- Recognize the various workflows and personnel observed within the perioperative setting
- Distinguish errors specifically noted within this setting
- Discuss various projects that have been previously successful at enhancing safety within the OR setting and increasing collaboration with pharmacy

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Poll

How established are you within the OR setting?

A) Not at all: This is considered a mysterious place to me
B) Somewhat: At least I know where the Automatic Dispensing Cabinets (ADCs) are located
C) Alright: I know who to contact for questions
D) Very: People come to me with their safety problems

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Introduction

- Errors in this setting are not novel
- Many organizations and publications available to assist with learning

2010 Anesthesia Patient Safety Foundation (APSF) focus to reduce medication errors[1,2]

- Standardize
- Technology
- Pharmacy
- Culture

Institute for Safe Medication Practice (ISMP)

- Acute Care ISMP Newsletter: Vol 26 Issue 2[3]
  - ISMP 2020 errors #2 – Not using smart infusion pumps with dose error-reduction systems (DERS) in perioperative settings
- Peri-op Self-Assessment[4]
  - 2021 publication

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Frequency[5]

2016 publication[5]

- 277 operations were observed with 3,671 medication administrations
- One in 20 perioperative administrations (n =193) resulted in either a medication error (ME) and/or Adverse Drug Event (ADE)
  - 153 (79.3%) were preventable
  - 70 (45.8%) had potential for patient harm

ISMP notes[6]

- Higher error rates
  - First 20 minutes of anesthesia induction
  - Procedures longer than six hours
  - Requiring 13 medications or more
- Most common error types: absent or incorrect labeling, wrong doses, failure to act, omitted doses, and wrong medications

Causes[1]

While many opportunities for errors, two specific areas are most vulnerable:

1. Selecting a drug container from which a medication dose must be withdrawn
   - Accidentally pick up the incorrect medication that looks similar to another container
2. Prepared syringe for administration
   - Can result in a “syringe swap” leads to accidentally administer the wrong medication from a different syringe than intended

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Additional Concerns[1-6]

Color coding	Syringe differentiation	Compounding	Drug concentrations	Limiting medication on sterile field
IV pump utilization	Safety culture and reporting	Vials vs syringes	Addressing/ Communicating shortages	Labeling
Medication organization within ADC	Medication usage (ex: IV Acetaminophen)	Opioid prescribing	Planned reversals (i.e., naloxone administration)	Repetitive tasks fostering automatic behavior
Not recognizing error occurred	Checking labels	Incorrect documentation	Medication timing	Communication between phases of care

Learning About OR Setting

- Learning about the OR setting can be difficult due to the lack of voluntary reporting
  - May not provide insight
- To identify and resolve safety concerns it is imperative to understand user workflow, but limited interactions occur between perioperative areas and pharmacy can make this difficult

How can we approach this setting?

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Approach

While data is important, it is imperative to establish a relationship with those actually partaking in the processes

Change is difficult

Need to defer to expertise (i.e., address THEIR concerns/frustrations)

Where can we start?

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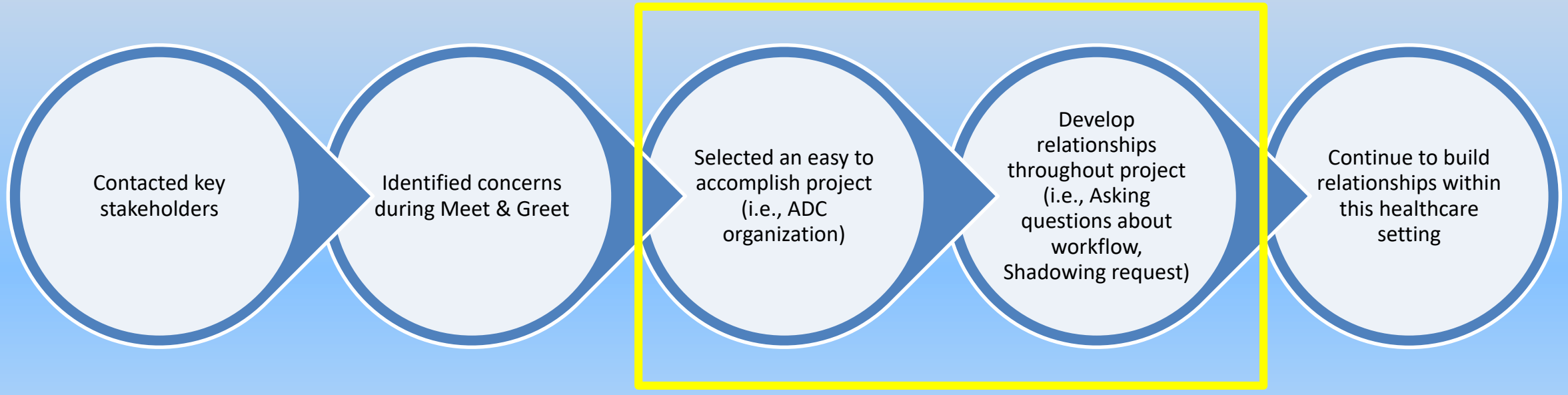
CHNw Approach



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ADC Organization

- Safety concern identified: Lack of standardization across ADC machines (both site and network) was causing delay in medication administration or incorrect products being pulled from ADC
- Originally started as a student project focusing on ADCs located within OB setting
  - Later expanded to all OR settings

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Implementation Key Concepts

Stakeholder workflow interviews

- OB CRNA workflow is left to right
- OR Anesthesiology workflow is front to back

Usage reports

- Ability to decrease par levels/reduce waste
  - Example: furosemide – 6 vials reduced to 1

Incorporate lean methodology

- Standardization of product location

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Key Concepts

To safely store medications, and prevent mix-ups, it is best to separate the following items from each other:

- Same size vials (especially if same color cap)
- Look Alike/Sound Alike medications
- Protect from light

Safe storage concepts:

- Items utilized more frequently place in drawers higher up and/or front part of drawer
- Space consideration
  - Large enough to store vials on side (instead of vials tops visible only)
  - Easily swap supply available (vials vs syringes) if shortage occurs
- Group neuromuscular blockers (NMBAs) together and ensure sticker is placed within storage spot
- Designate items (especially emergency medications) as standard stock to prevent accidental removals
- Maintain organization and prevent deviations through yearly review process

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Drw 2.1

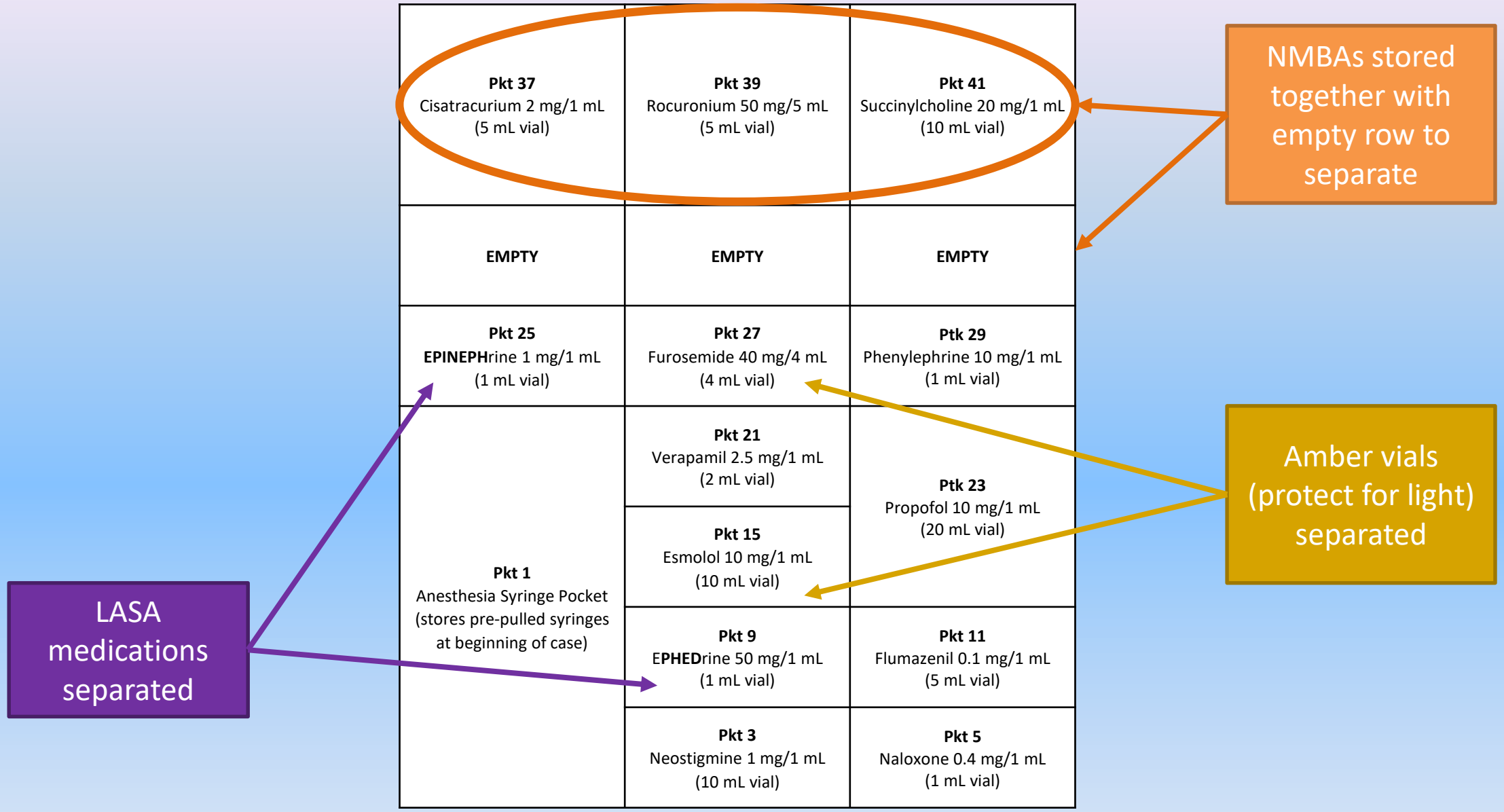
Pkt 37 Atropine 0.4 mg/1 mL (1 mL vial)	**EMPTY**	**Pkt 41** Ammonia (0.3 mL) inhaler
Pkt 31 Calcium gluconate 1 g/10 mL (10 mL vial)	**Pkt 33** Glycopyrrolate 0.2 mg/1 mL (1 ml vial)	**Pkt 35** Hydrocortisone sodium succ 100 mg/2 ml (2 mL vial)
Pkt 25 White petrolatum-mineral oil 3.5 g ointment	**EMPTY**	**Ptk 29** Etomidate 2 mg/1 mL (10 mL vial)
Pkt 19 Normal Saline (10 mL vial)	**Pkt 21** Dexamethasone 10 mg/1 mL (1 mL vial)	**Ptk 17** Ketorolac 30 mg/1 mL (1 mL vial)
Pkt 13 Terbutaline 1 mg/1 mL (1 mL vial)	**EMPTY**	
Pkt 1 Ondansetron 4 mg/2 mL (2 mL vial)	**Pkt 3** DiphenhydrAMINE 50 mg/1 mL (1 mL vial)	**Pkt 5** Metoclopramide 5 mg/1 mL (2 mL vial)

Item not used often in back

10 mL vials separated

2 mL vials separated

Drw 2.2


Pkt 37
Cisatracurium 2 mg/1 mL
(5 mL vial)
Pkt 39
Rocuronium 50 mg/5 mL
(5 mL vial)
Pkt 41
Succinylcholine 20 mg/1 mL
(10 mL vial)
NMBAs stored together with empty row to separate
EMPTY
EMPTY
EMPTY
Pkt 25
EPINEPHrine 1 mg/1 mL
(1 mL vial)
Pkt 27
Furosemide 40 mg/4 mL
(4 mL vial)
Ptk 29
Phenylephrine 10 mg/1 mL
(1 mL vial)
Pkt 21
Verapamil 2.5 mg/1 mL
(2 mL vial)
Ptk 23
Propofol 10 mg/1 mL
(20 mL vial)
Amber vials (protect for light) separated
Pkt 15
Esmolol 10 mg/1 mL
(10 mL vial)
Pkt 1
Anesthesia Syringe Pocket
(stores pre-pulled syringes at beginning of case)
LASA medications separated
Pkt 9
EPHEDrine 50 mg/1 mL
(1 mL vial)
Pkt 11
Flumazenil 0.1 mg/1 mL
(5 mL vial)
Pkt 3
Neostigmine 1 mg/1 mL
(10 mL vial)
Pkt 5
Naloxone 0.4 mg/1 mL
(1 mL vial)

Shadowing

- Enhance understanding

Workflows	Room layout	Roles/Responsibilities

- Ability to connect and build relationships
- Gain perspective on THEIR concerns and thought processes around potential solutions
  - Trained to think STPC
  - Use to create buy-in
    - Connect with change purpose

Standardization
Technology
Pharmacy/Prefilled/Premixed
Culture

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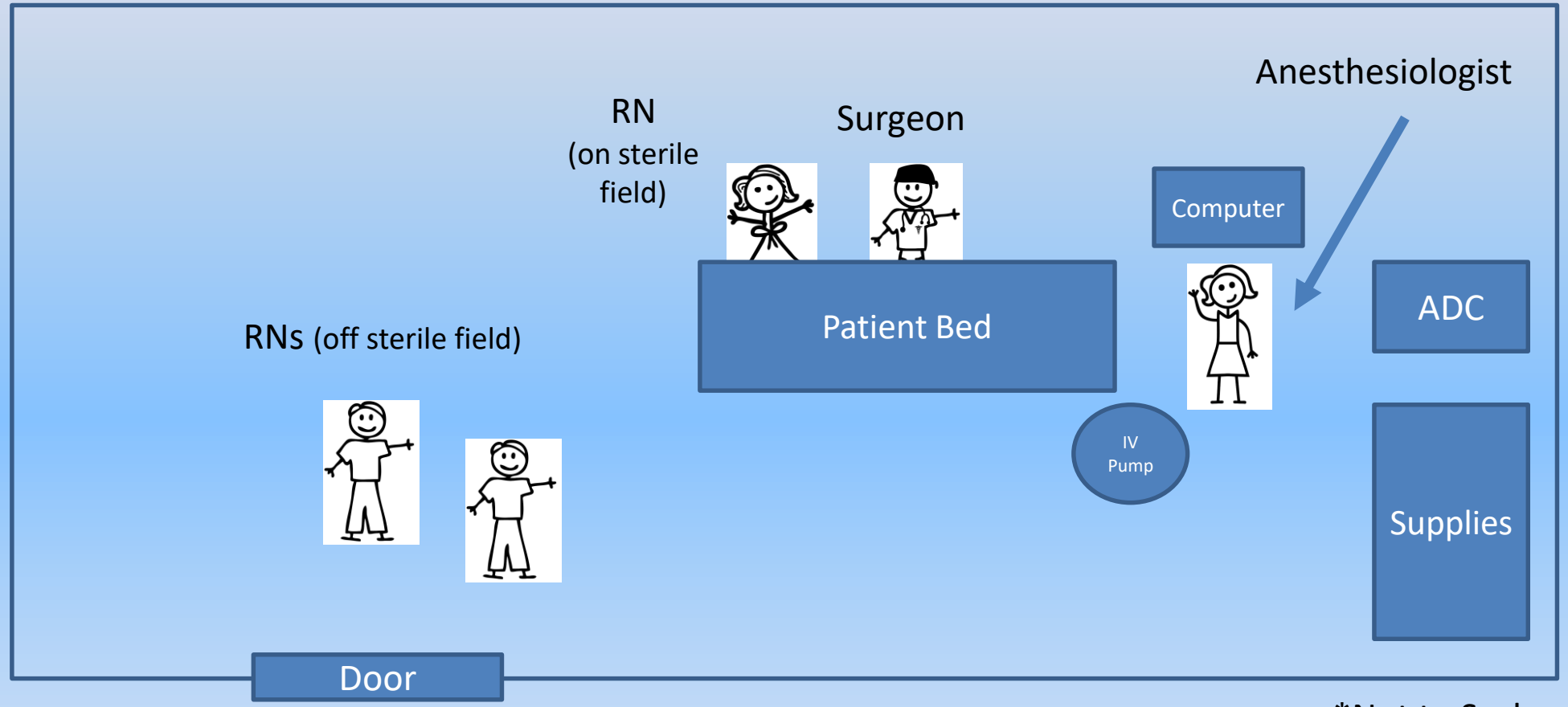
Shadowing



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Case Preparation

Medications pulled
- Antimetics, opioids, and NMBAs always
- Placed to side, but in organized fashion (first to give up front; last to give farthest away)
- If needed, pressors pulled and set away from other medications

Antibiotic given
- Antibiotic comes from circulating RN (if not already given in preop)
- Ordered by the surgeon
- Given just prior to start of surgery

Medications prepared
- Dilutions (if needed) to appropriate concentrations
- Medications drawn up into syringe with label

TIME OUT
- Confirms with team
- No other activities occurring

Administration
- Sedating medications and NMBA given

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Shadowing Checklist

- Beneficial review items
  - Who is giving the medications? When does surgeon or anesthesiology give?
  - Which medications are given preop, during surgery, or postop? How is this communicate?
  - When are medications given in relation to Time Out procedure?
  - Where is the medication coming from? If not stored in the ADC how they are getting these medications?
  - Which medications are being manipulated? Dilution vs compounding?
    - EASY WIN: Can pharmacy purchase ready to use pre-drawn products?
  - How and where do they organize the medications pulled for the case? Who pulls these medications and when?
  - What do THEY FEEL is the biggest safety risk within their setting?

Questions

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