

# REDUCING MEDICATION ERRORS IN POST-OPERATIVE PATIENTS IN THE POST-ANAESTHESIA CARE UNIT (PACU)

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## Mission Statement

To reduce medication errors in post-operative patients in the Post-Anaesthesia Care Unit (PACU) from baseline of 15-20 per 1000 patients, to < 5 per 1000 patients within 6 months. (With a stretch target of zero.)

## Team Members

	Name	Designation	Department
Team Leader	Dr Caroline Ong YM	Consultant	AICPM
Team Members	Dr Tan Bin Hui	Senior Resident	AICPM
	Dr Christine Ong HJ	Senior Resident	AICPM
	Dr David Mathew	Junior Resident	AICPM
	Ms Cheng Wai Chu	Senior SN II	PACU
	Ms Yin Shengnan	Senior SN II	PACU
	Dr Serene Tang EL	Assoc Consultant	General Surgery
	Dr Liu Huimin	Assoc Consultant	General Surgery
Facilitators	Adj A/Prof Tan Hui Ling and Ms Ng Puay Shi		

## Evidence for a Problem Worth Solving

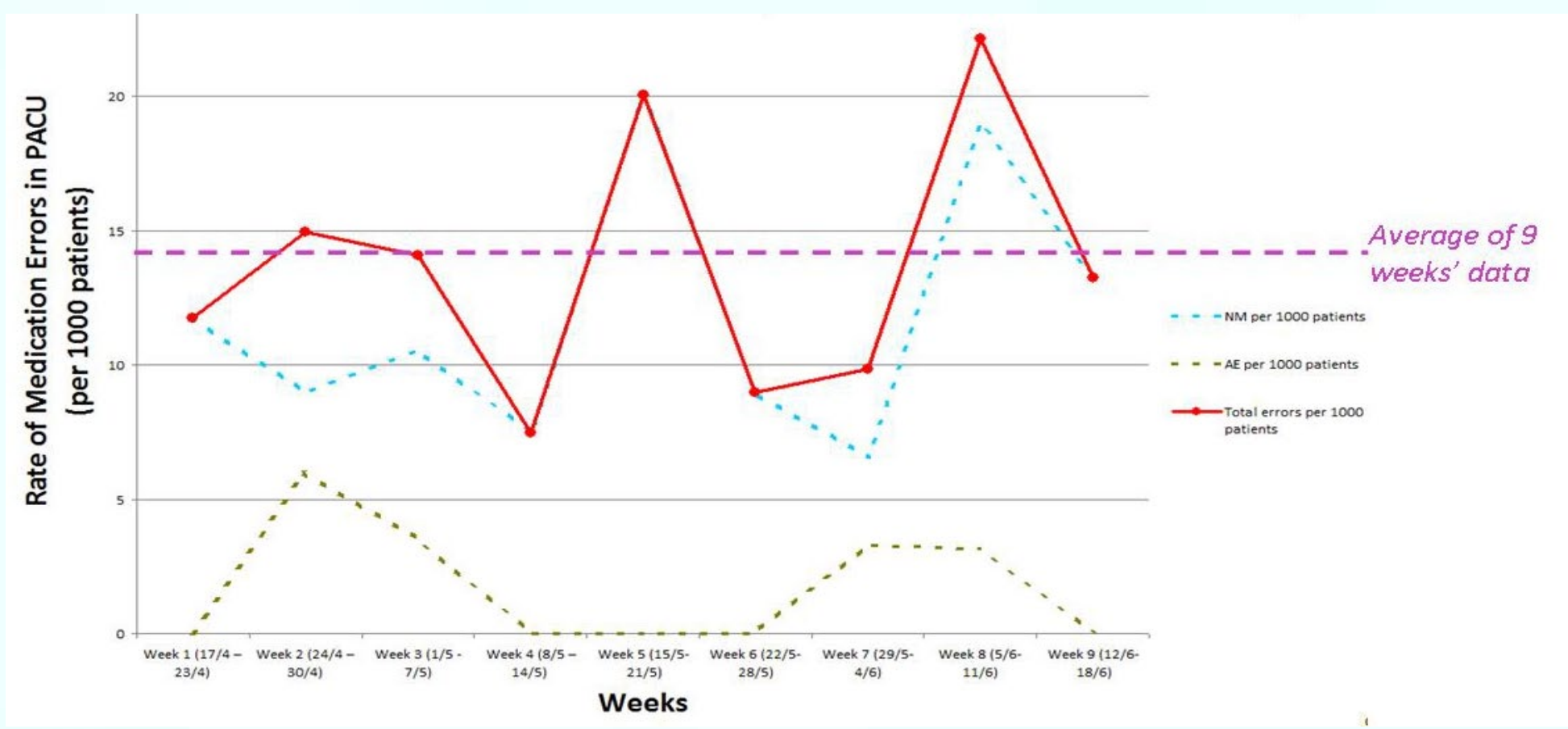
### Perioperative patients are at high risk of medication errors

- Complex patients with multiple co-morbidities, poly-pharmacy.
- Receive large number of medications and/or change in medications in a relatively short perioperative period.
- High-stress, fast-paced nature of perioperative care.
- Rapid succession of handovers of care increases risk of errors.

**International incidence of perioperative medication errors** (including near misses) is 3.7 to 7.5 per 1000 anaesthetics Webster (2001), Llewellyn (2009), Cooper (2012)

## Current Performance of a Process

### Rate of Medication Errors in PACU (Adverse Events + Near Misses)



### Commonest Errors Encountered

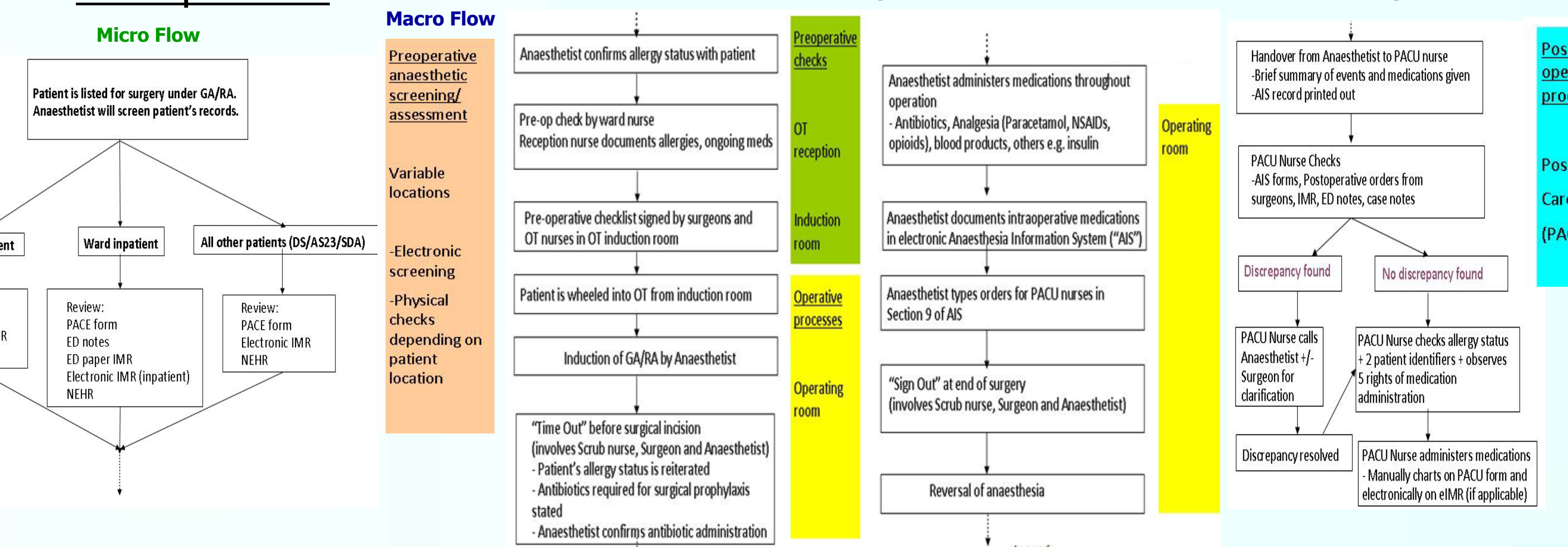
Error Type	Example	Potential for harm
Omission	Failure to administer antibiotic ordered on eMR (administered >2 hr past due time)	Sepsis due to untimely administration of culture-directed antibiotics
Repetition	IV Parecoxib 40mg administered intraoperatively but PO Arcoxia 120mg was ordered as a "once" dose in PACU	Toxicity from NSAIDs: - Bleeding risk - CNS toxicity - Acute renal failure
Incorrect dose	PO Paracetamol 500mg ordered (liver impairment) but PACU nurse gave PO Paracetamol 1g instead	Potential systemic toxicity from Paracetamol in setting of acute liver impairment

## Flow Chart of Process

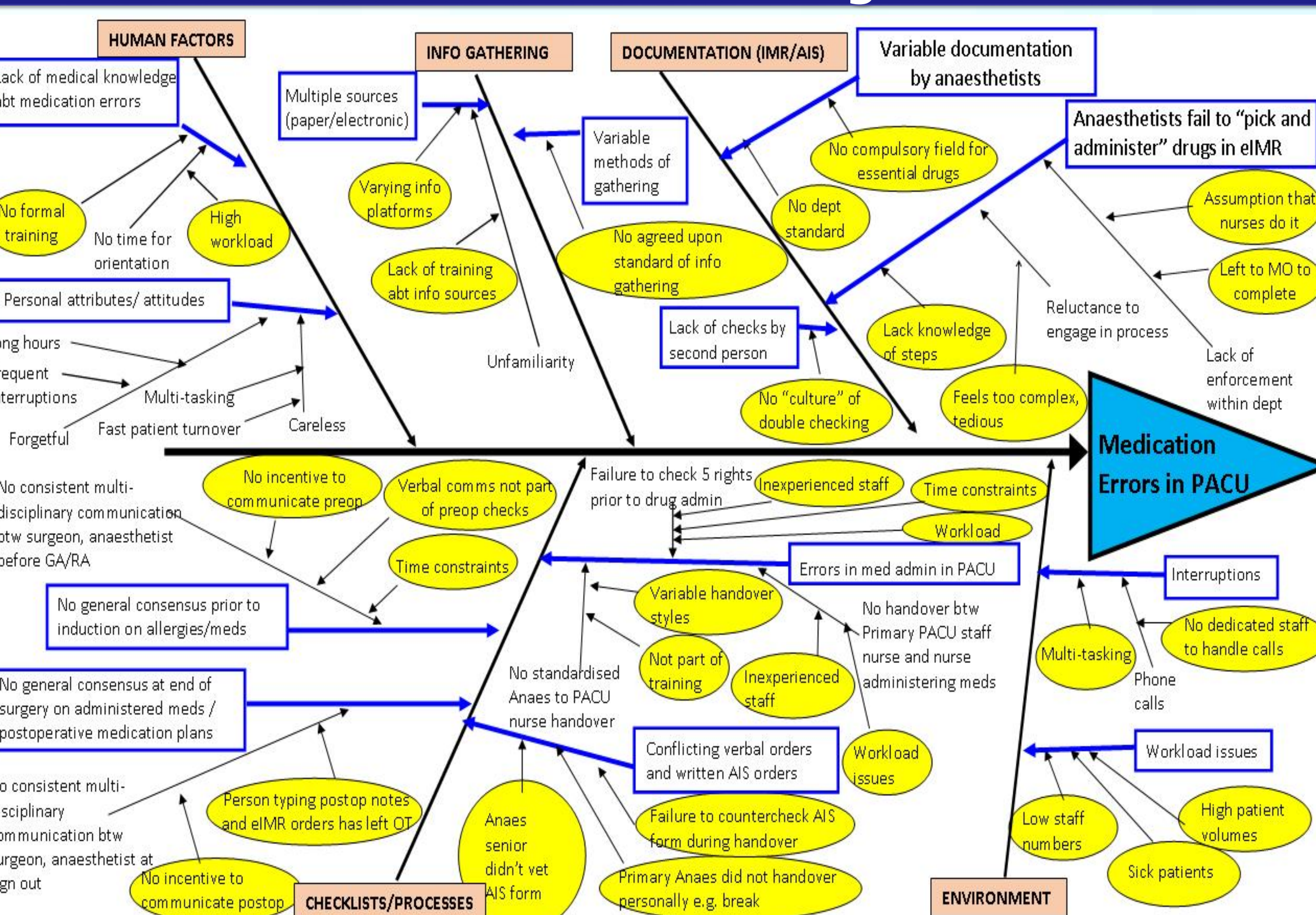
### Pre-Operative

### Pre & Intra-Operative

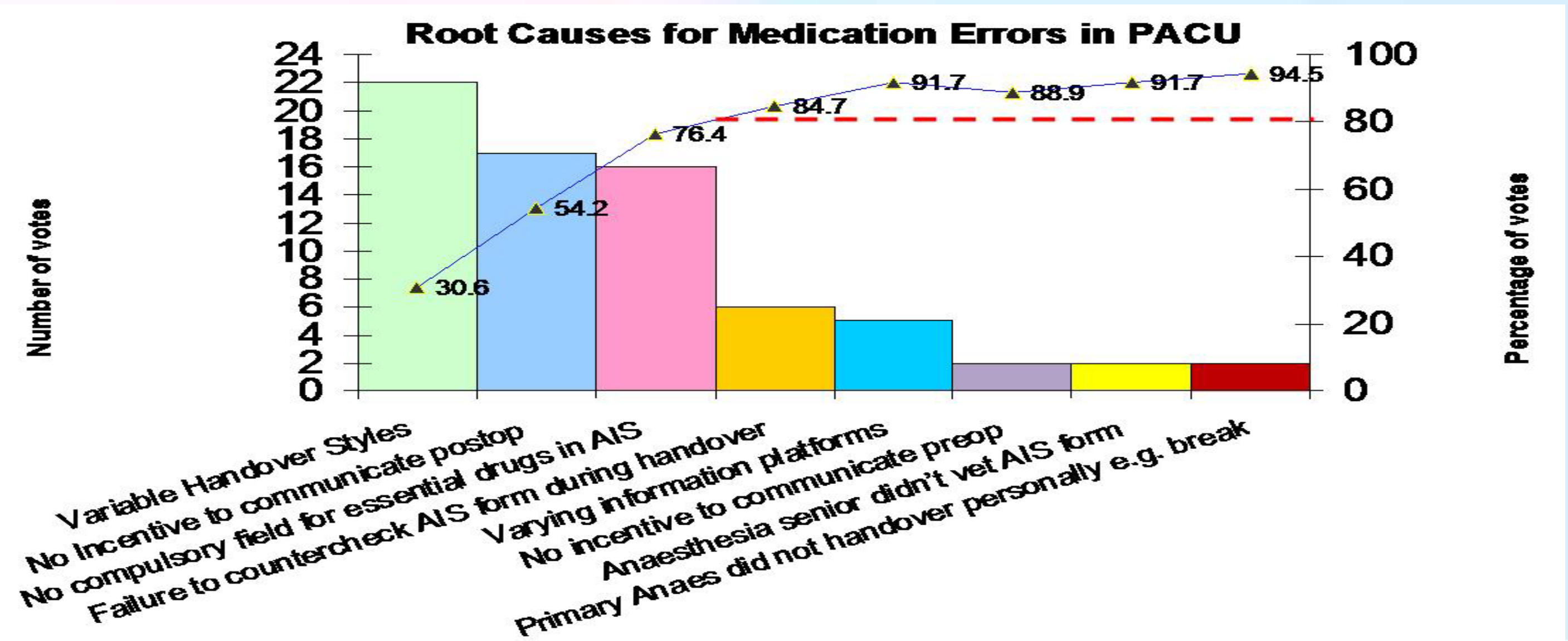
### Post-Operative



## Cause and Effect Diagram



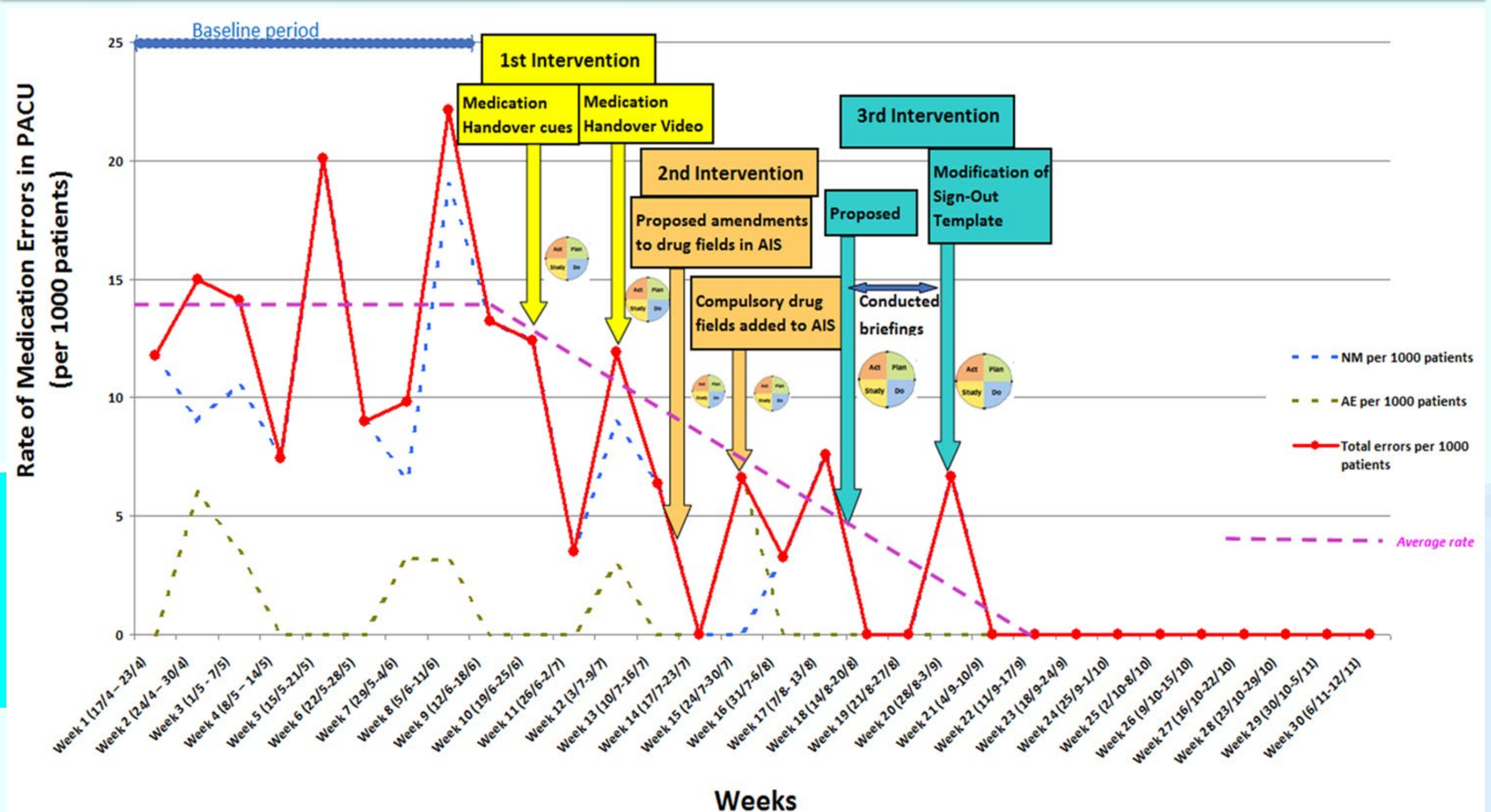
## Pareto Chart



## Implementation

ROOT CAUSE	INTERVENTION	DATE IMPLEMENTED
Variable handover styles	<ul style="list-style-type: none"> <li>Creation of <b>Medication Handover Cues</b> card</li> <li>Creation of <b>video</b> demonstrating integration of cues into simulated handover</li> </ul>	19 June 2017  3 July 2017
No compulsory field for essential drugs in AIS	Creation of <b>compulsory, standardised fields</b> in AIS program for Paracetamol, NSAIDs and Antibiotics, under "PACU orders" section of program	27 July 2017
No incentive to communicate at end of surgery, leading to lack of consensus on administered medications or postoperative plans	Modification of existing <b>Sign-Out template</b> that is read out at end of surgery, to include the question "Has the analgesia and antibiotic plan been discussed between anaesthetist and surgeon?"	28 August 2017

## Results



## Cost Savings

Per patient	Item	SGD 4216* to SGD 8845# (USD 3100*) (€5521#)
	Average cost of treatments	
	Cost of Intervention	0
	Total cost of care	SGD 4216* to SGD 8845# (USD 3100*) (€5521#)
<b>Annualized</b>	Average cost of treatments	SGD 219,232* to SGD 459,940 #
	Cost of Intervention	0
	Total cost of care	SGD 219,232* to SGD 459,940 #

With these simple, meaningful interventions, there were no costs incurred, only savings made.

Safer care is also, in itself, cheaper care!

## Lessons Learnt

- Creation of new data collection process to accurately detect problem.
- Engagement and empowerment of stakeholders, esp. PACU nurses.
- Working in multi-disciplinary teams to solve a complex problem.

## Strategies to Sustain

- #1: Handover cues and video has been added to New MO Orientation training; Medication handover in PACU is now assessed in MO test.
- #2: Compulsory drug fields are embedded in AIS program for all cases.
- #3: New Sign-out process now integrated into training and orientation processes for OT staff, with a view to modifying electronic Sign-Out template; Continue to encourage culture of open communication between surgical, anaesthesia and nursing teams in OT.