PREVENTION OF MEDICATION ERRORS DURING CARDIOPULMONARY RESUSCITATION

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• Human errors are noted by the Institute of Medicine report, “To Err is Human” in 1999 reported that between 44,000 and 98,000 patients die annually in the USA due to preventable medication errors.

• The medication errors in the Intensive Care unit ranges from 8.1 to 2344 per 1000 patient – days (Wilmer et al. 2010).
DEFINITION

- Medication error may be defined as “mistakes associated with drugs and IV solutions that are made during the prescription, transcription, dispensing and administration phases of drug preparation and distribution (Wolf 1989:8).

- A medication error is any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient or consumer (National Coordinating Council for Medication Error (2017).

- Medication errors occur from “pen to patient”.
CAUSES FOR MEDICATION ERRORS DURING RESUSCITATION

• Cardiopulmonary resuscitation is an demanding and stressful situation.
• Commotion
• Use of high risk/alert medications
• Miscommunication
• Fast-paced environment
• Lack knowledge on calculations.
LITERATURE REVIEW

• Literature review was conducted by using MEDLINE, CINHAL and Cochrane databases.

• Search terms: medication errors, resuscitation, evidence based guidelines.

• The articles published between 2007-2014 were reviewed.
SWISS CHEESE MODEL OF SYSTEM ACCIDENTS.

Some holes due to active failures

Other holes due to latent conditions

SUCCESSIVE LAYERS OF DEFENSES
SWISS CHEESE MODEL

- Defenses, barriers and safeguards occupy a key role in preventing medication errors.

- According to the Swiss cheese model – hole in the one slice does not cause bad outcome.

- Hole in the many slices - accidents, hazards, damage to the contact.
SWISS CHEESE MODEL

SYSTEM APPROACH

- Active failure
- Organizational process
- Management decision
- Lack of policies
- Latent failure
- Fatigue, Shortage of staff
- Time pressure, inadequate
- Equipment, inexperience.
- Team work

PERSON APPROACH

- Slips, lapses
- Miscalculations
- Miscommunications
- Omission
- Wrong administration of the drug
- Violation- intentional/ non-intentional
- (Reason:2000).
TYPES OF ERRORS DURING RESUSCITATION

- Dosing errors
- Drug selection errors
- Drug preparation errors
- Administration technique errors
- Omissions.
ERRORS ASSOCIATED WITH RESUSCITATION

• Wrong dose

• Wrong concentration

• A dopamine drip was programmed to infuse 10mcg/kg/hour instead of 10mcg/kg/minute.

• Dextrose 50% IV was prescribed for a 4Kg infant instead of dextrose 10%

• Pharmacy stocked the emergency cart with atropine 0.5,g instead of 1 mg.
ERRORS ASSOCIATED WITH RESUSCITATION

- Wrong drug
- Delayed or omitted doses
- Medication delivery device problem

- Nurse found a vial of Furosemide instead of midazolam (look alike products).
- An empty box of Epinephrine was identified by a nurse in the crash cart.
- Broken infusion pump
RISK REDUCTION STRATEGIES TO PREVENT NEDICATION ERRORS DURING RESUSCITATION

- Standardization and access of emergency trolley
- Stocking the necessary medications in the emergency trolley
- Accessibility of drug information during resuscitation
- Debriefing before, during after resuscitation
STANDARDIZATION AND ACCESS OF EMERGENCY TROLLEY

• Standardization of emergency trolley equipment throughout the organization (defibrillator).

• If one universal emergency trolley is used for both adult and children, separate label should be sued indicating specifically for children and adult.
STOCKING THE NECESSARY MEDICATIONS

- Pharmacy should take full responsibility to stock the emergency trolley.
- Ready to use syringe with medications.
- Limit the availability of using drugs with multiple vials.
- Provide medications according to the current ACLS/PALS guidelines.
- Do not stock medications that are not required during resuscitation.
- Stock the pediatric/neonatal drugs separately
- Label each compartment of drugs clearly & legibly
- Remove the expired drugs
ACCESSIBILITY OF DRUG INFORMATION

• Provide standardized drug reference for the available drug in the ER trolley.
• For pediatric drugs provide weight based reference guidelines.
• Include ACLS/PALS trained pharmacists in the drug committee.
DEBRIEFING BEFORE, DURING AND AFTER RESUSCITATION

- Conduct regular simulation codes (adult, pediatric, neonatal) to assist staff learn expected roles, practice and clinical skills (practice with prescribing, verifying appropriate medication and doses).
- During emergency repeat back verbal medication orders.
- Internal interdisciplinary code review/debriefing meetings with staff who were present during resuscitation (any specific problems, suggestions and improvements).
- Clear roles and responsibilities for post-code procedures, timely restocking the trolley.
- Follow the current philosophy of “BLAME LESS CULTURE”
CONCLUSION

• **Collateral damage:**

• During resuscitation – the patients involved in the resuscitation are not the only one who may be affected by medication errors.

• Other patients who are assigned to the nurses are also affected.
REFERENCES


