Medication Safety: Key to Patient Safety

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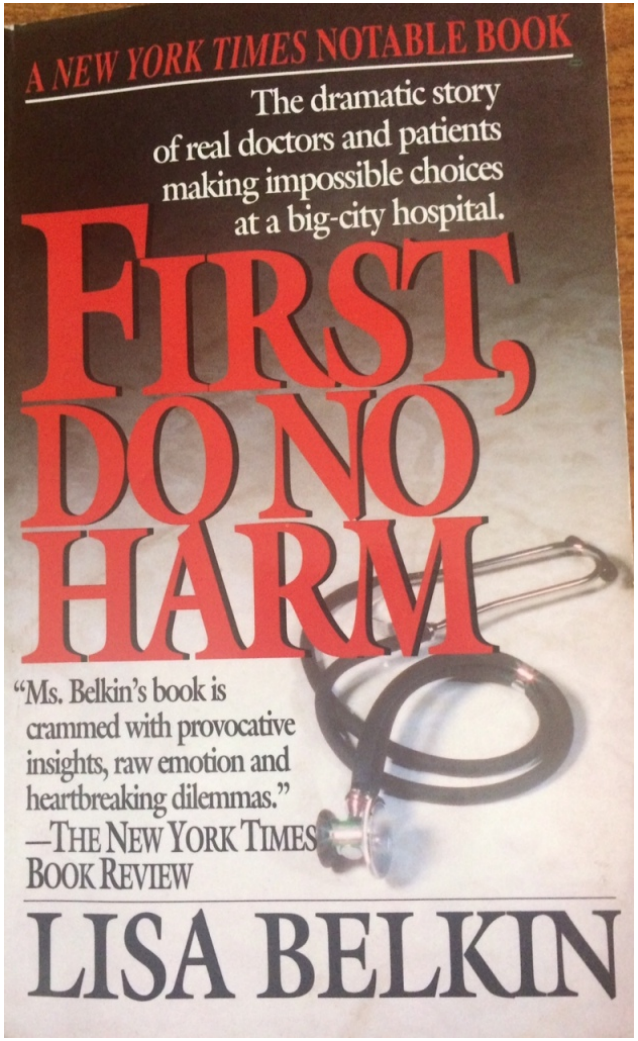
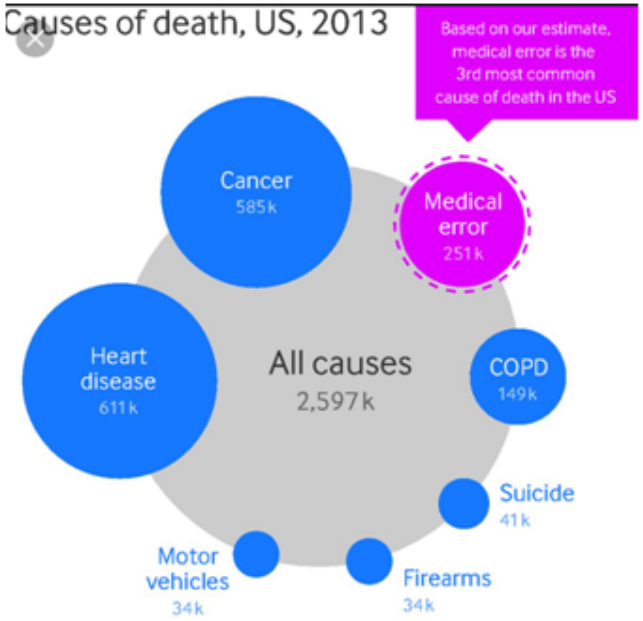
Patient Safety

- **Defined as freedom, as far as possible, from harm or risk of harm, caused by medical management (as opposed to harm caused by the natural course of the patients original illness or condition).**



Magnitude of Harm is Significant

Medical error the 3rd leading cause of death in the US



- **As many as 440,000 patient deaths annually (James 2013).**
  - **~1 in 10 patients develops an adverse event during hospitalization (AHRQ).**
  - **~1 in 2 surgeries had a medication error and/or an adverse drug event (Nanji et al. 2015).**
  - **>12 million patients each year experience a diagnostic error in outpatient care (Singh et al. 2014).**

……BUT no such data from India

Medical errors in news

22 JUNE 2016 | SOCIETY

Delhi: Doctor Operate Upon Youth's Wrong Leg, DMC Takes Cognisance

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AAA INCREASE TEXT SIZE

In an alleged case of medical negligence, doctors at a private hospital here have wrongly operated upon the left leg of a 24-year-old youth instead of the injured right leg.

The Delhi Medical Council has taken suo motu cognisance of the matter and initiated an enquiry into it.

Ravi Rai, a resident of Ashok Vihar, injured

everylifecounts.ndtv.com

Newborn In Kolkata Given Wrong Injection. Nurse Says, 'By Mistake'

Monideepa Banerjie September 9, 2016

Drug dispensing errors among medical incidents seen in children in primary care

The Pharmaceutical Journal | 25 JAN 2017 | By Emma Wilkinson CA

An international team of epidemiologists and medical statisticians analysed 2,191 safety incident reports from NHS 111, out-of-hours services, community pharmacies and GP surgeries. They found that 30% (or 658 cases) of the errors were "harmful", including 12 deaths and 41 reports of severe harm.

The team also found that 674 incidents were medicine-related. Of these, 57% of these were dispensing errors in community pharmacies, 18% were administration errors (usually at home) and 10% were prescribing errors.

19% of the total were children below 1 year , and they were mainly being

Adverse Event

- An injury caused by medical management rather than the underlying condition of the patient
- No causal relationship

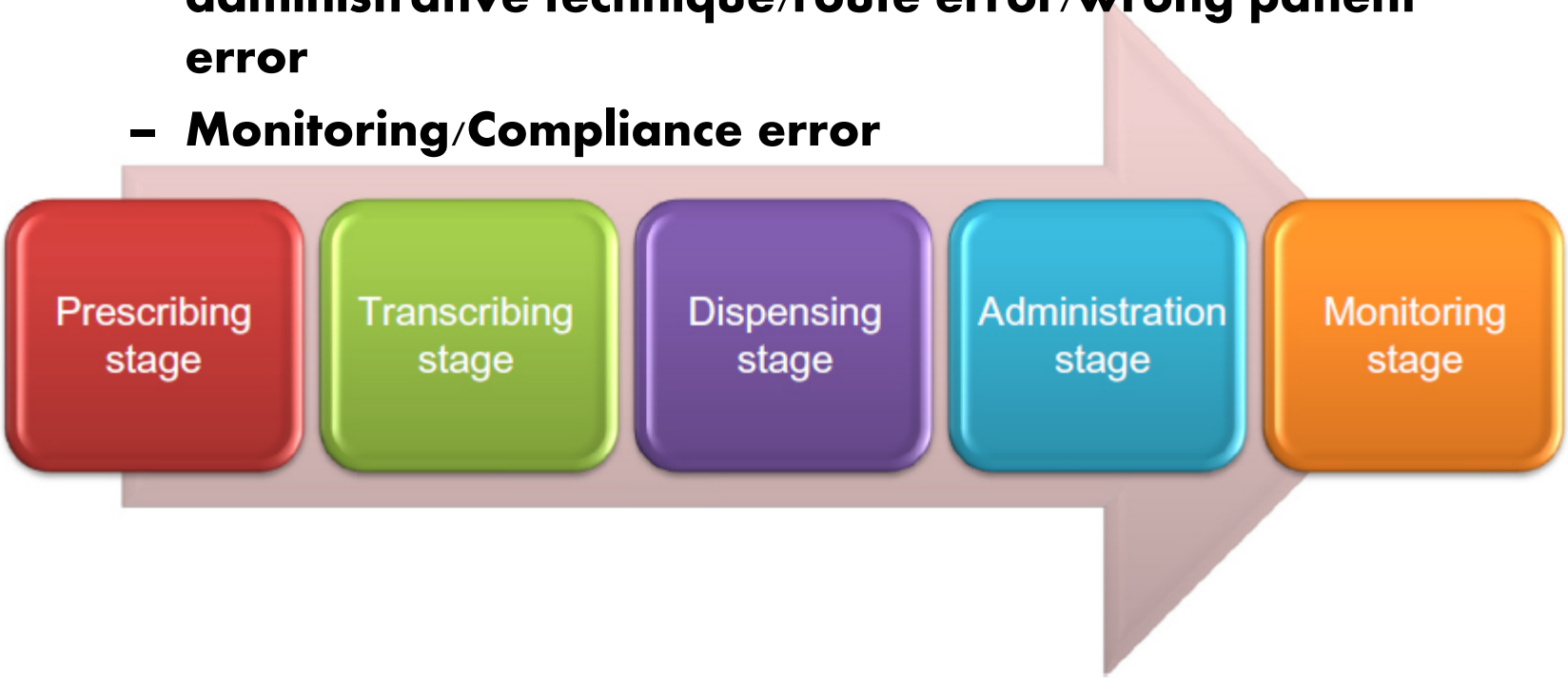
Adverse Drug Reactions

- Adverse Drug Reaction (ADR) is response to a drug that is noxious and unintended, and occurs at doses normally used in patients for prophylaxis diagnosis or therapy of a disease. Excludes
- Therapeutic failures, overdose, drug abuse, Noncompliance, Medication errors
- Causal relationship

Quality* and safety are inextricably linked;
Most harm caused by medical practice is avoidable

Types of Medication errors

- **Medication errors leading to the death or serious disability of patient due to:**
  - **omission error**
  - **dosage error/dose preparation error**
  - **wrong time /wrong rate of administration /wrong administrative technique/route error/wrong patient error**
  - **Monitoring/Compliance error**



Incidents and errors definitions

Near Miss

- A near miss is an unplanned event that did not result in injury, illness, or damage as is *realized just in the nick of time* and abortive action is instituted to cut short its translation – but had the potential to do so
- No harm used synonymously with near miss when the *error is not recognized and the deed is done* but fortunately for the health care professional, the *expected adverse event does not occur*

Sentinel event

- An occurrence unplanned, not scheduled or anticipated, resulting in death, serious harm, or the risk for physical or psychological harm.
- Such events are called sentinel event because *they signal the need for immediate investigation & response*

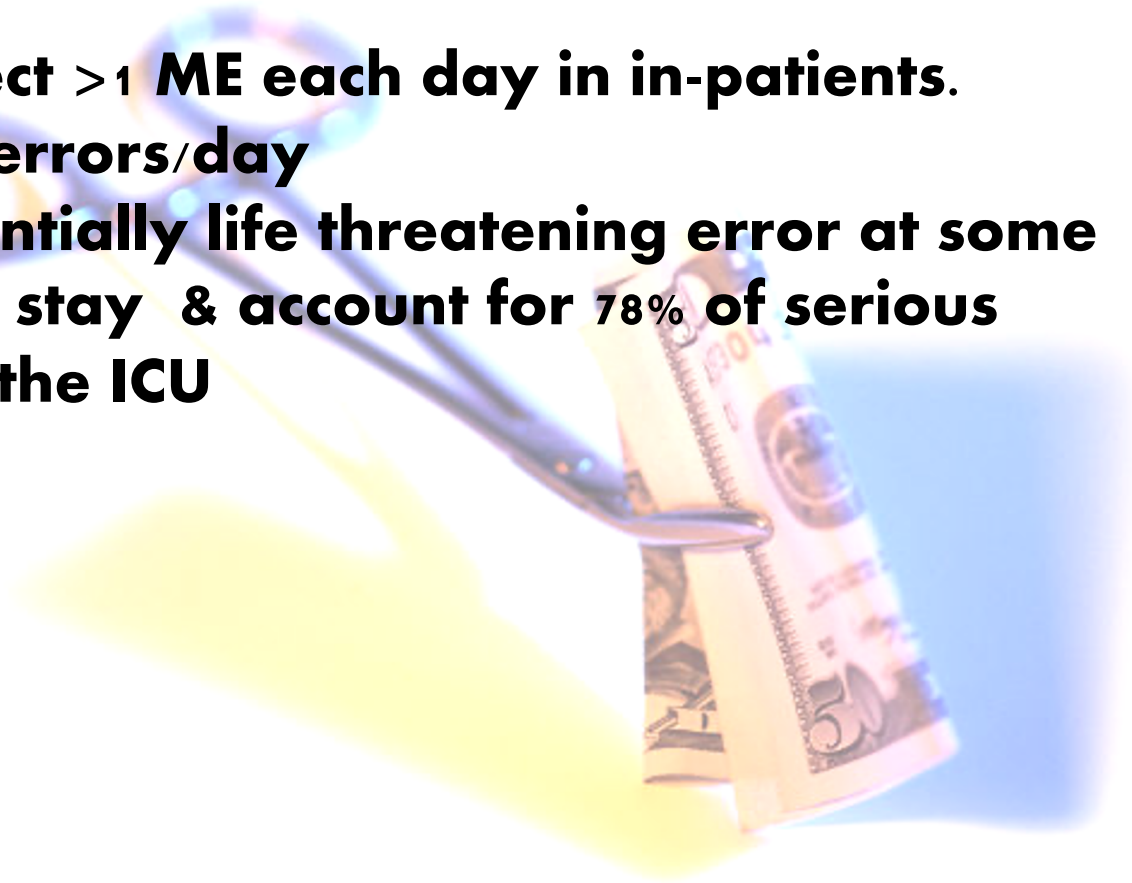
Checking for near misses/no harm prevents sentinel events

A medication error by definition is a preventable adverse event; however, may or may not result in an actual or potential adverse drug event.

Adverse Drug Reactions are inevitable but Medication Errors..... are preventable

Epidemiology of MEs and their cost

- Errors in ambulatory prescribing are a major public health problem.
- On average expect >1 ME each day in in-patients.
- In ICU, expect 1.7 errors/day
- ~ all suffer a potentially life threatening error at some point during their stay & account for 78% of serious medical errors in the ICU



Uniqueness about the ICU and MEs

Complex environment

- High-risk patients/sedated
- Difficult working conditions/High stress
- High turnover of patients and providers
- Emergency admissions
- Multiple care providers - Challenges the integration of different care plans
- Over-reliance on sophisticated technologies & equipment
- Lack of continuity of care at discharge from the ICU

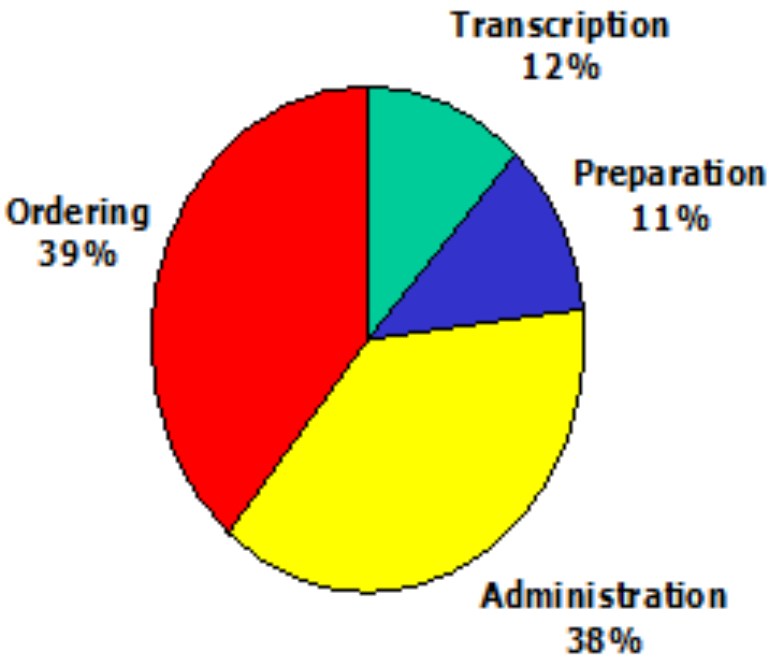
Types of medications

- Twice as many medicines compared to other areas.
- Frequent use of boluses and infusions
- IV Programming errors of infusion pumps
- Weight-based infusions/Mathematical calculations required for medication dosages
- Increased probability of MEs & interactions

Exercise caution during Multi-disciplinary Care Provision and at transition points

Where do errors occur

- Administering the wrong drug, strength, or dose
- Confusion over look-alike and sound-alike drugs
- Dose miscalculations
- Incorrect notations
- Errors in prescribing and transcription



Polypharmacy is the largest risk factor

Paediatric & geriatric patients are especially susceptible.

•Goulding. *Arch Intern Med*. 2004;164:305-312

Who is at most risk?

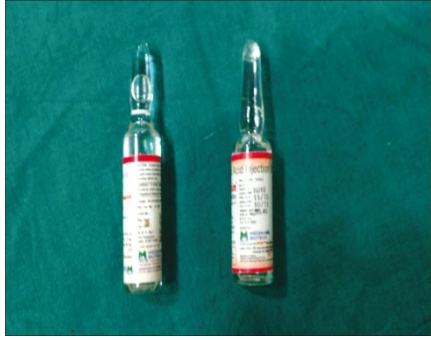
- **High alert medicines**
  - Medication that have a higher likelihood of causing injury if they are misused.
  - Errors with these medications are not necessarily more frequent – just that their consequences may be more devastating.
- **High-risk medications**
  - Drugs with narrow therapeutic range – Antiepileptic drugs, lithium
  - Controlled substances - Morphine, diazepam, psychotropic medicines,
  - Look-alike & sound-alike (LASA) medicines
  - Can cause significant harm when **system** errors occur.

High alert medicines

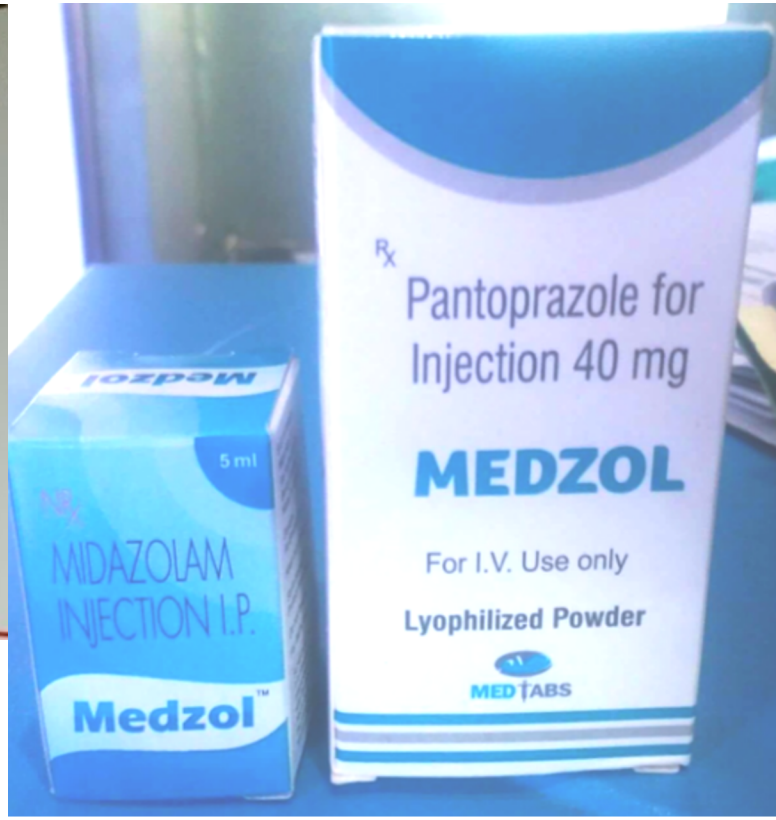
- Concentrated electrolytes
- Insulin
- Anticoagulants
- Adrenergic agonists
- IV adrenergic antagonists
- Chemotherapy
- Chloral hydrate/midazolam liquid in children
- IV digoxin
- Neuromuscular blocking agents
- Opiates
- Theophylline

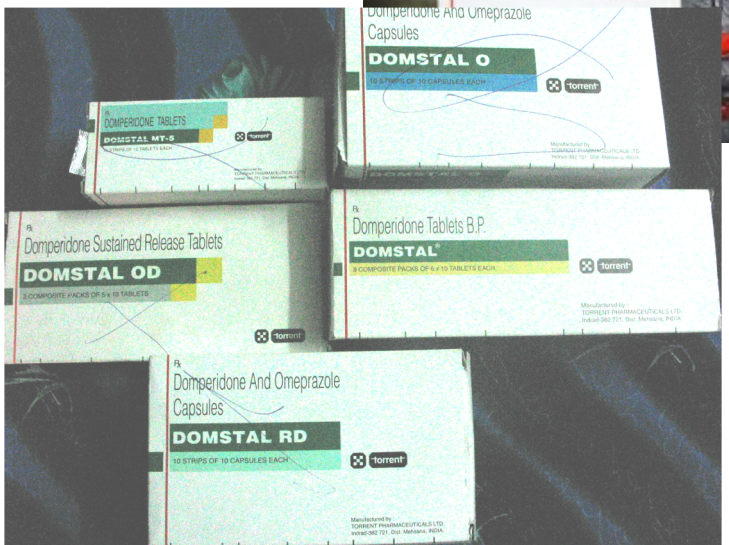
Patients receiving LASA medicines

- Lante Vs. Lantus
- PAM and PAN
- Daonil vs. diavol
- Glynase Vs. Zinase
- Lasix Vs. Lorax
- Incidal vs. Incedral
- Arkamin vs. Artamin
- Celin vs. Celib
- Prilosec® vs. Prozac
- Erox Vs. Erix
- Lamisil vs. Lamictal
- Celebrex vs. Celexa
- Zosyn vs. Zofran
- Isoprin Vs. Isoptin
- Thousands more, some reported, most not



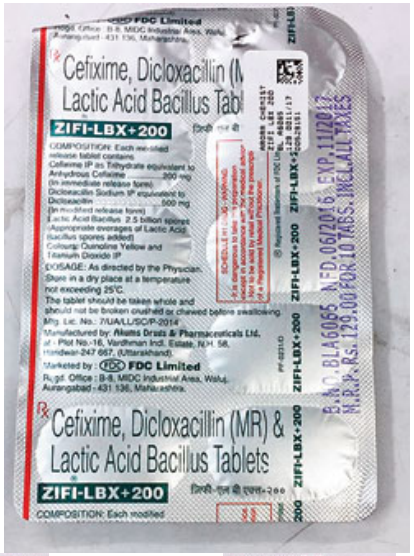
Errors due to similar brand names of drugs and formulations

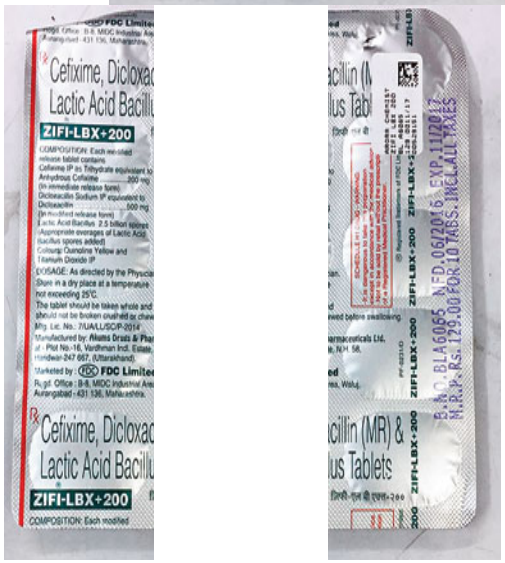


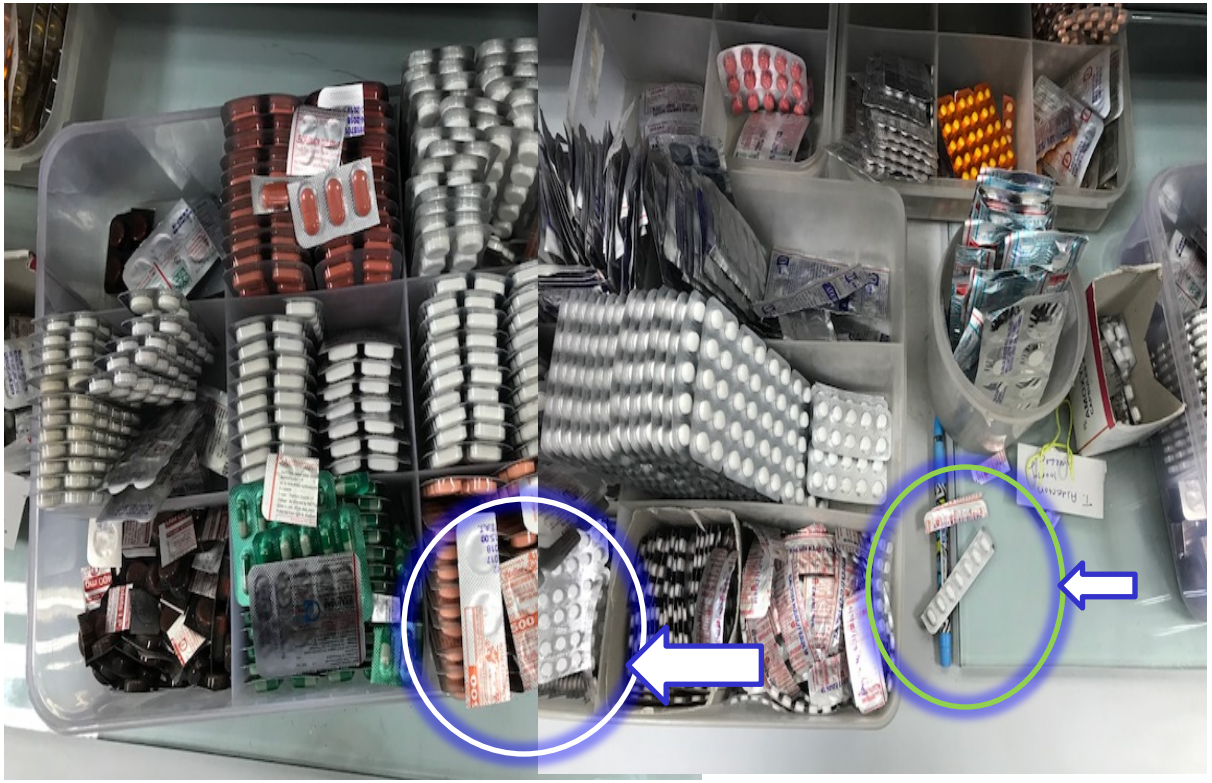


A CASE FOR GENERICS

Errors due to strip cutting and mix –up due to bad storage







Loss of essential information on dose strength/dosage form, expiry date, batch no. etc. Result in errors if involving LASA

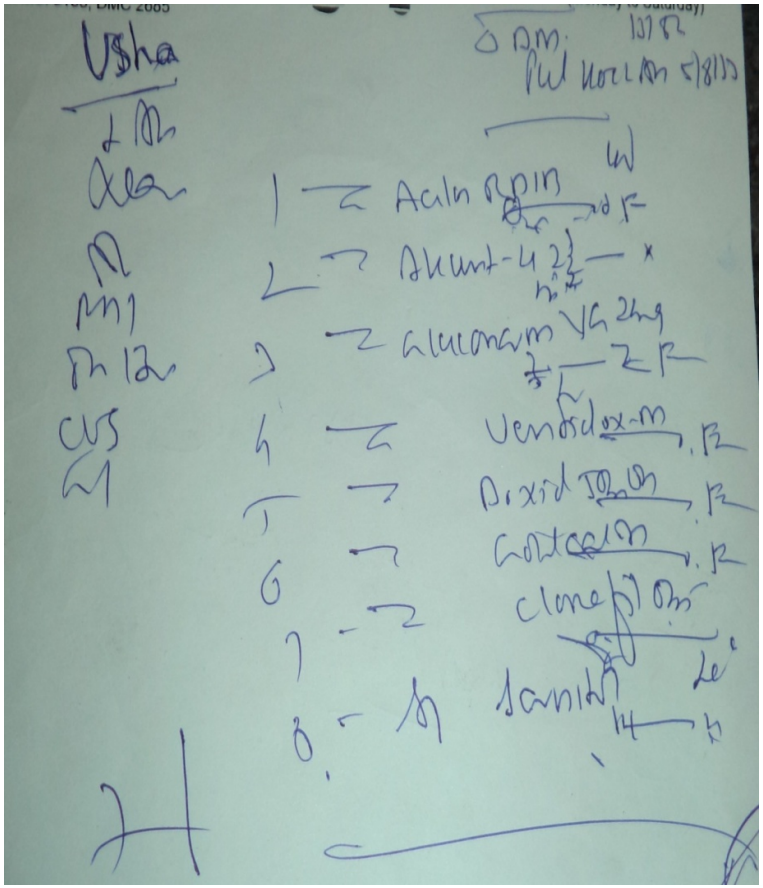
Drug administration errors

- **Failure to "Shake Well" - lead to an under dose or over dose e.g., phenytoin, Insulin Suspensions**
- **Crushing Medications that should not be crushed – enteric coated**
- **Inadequate Fluids with Medications**
- **Allowing patient to Swallow Sublingual Tablets**

Failure of communication

- **Poor communication accounts for >60% of the root causes of sentinel events reported to the Joint Commission.**
- **A patient died after labetalol, hydralazine, and extended-release nifedipine were crushed and given by NG tube due to profound bradycardia and hypotension leading to cardiac arrest. Although she was successfully resuscitated, she received the drugs the same way the next day.**
- **Crushing extended-release medications allows immediate absorption of the entire dosage.**

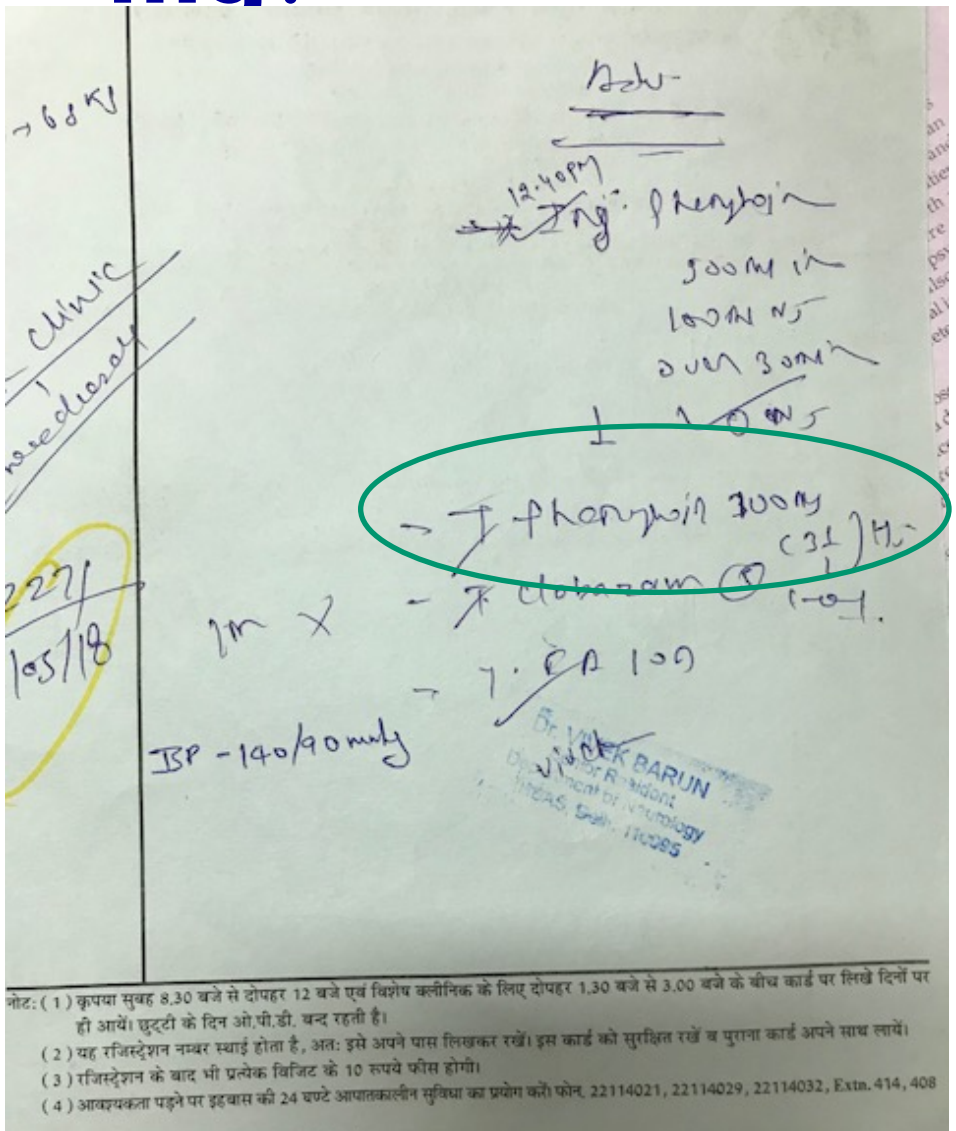
Can you read this?



Illegible handwriting and second guessing by pharmacist

Do not hesitate to check the dose & frequency, if you are not sure

Phenytoin dose 300 mg or 100 mg?



High alert drug

Cross out and rewrite

28/3/17
C-169

13/07/17
C-279

KICIO- S.D. on AED :: Jan 20
No fresh complain

Adv

CST X 2 months

15/7/17

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21/07/17
M-90

c/o nausea.

Adv

1) ① ② ③ ④ CST × 2 month

2) Tab Pregab- M 1 tab BD × 2 month
M Cap Zerit 1 cap OD × 2 month.

4) Tab Pan (40) 1 tab OD × 1 month

3/18
-59

Klebs. D.

CST × 2 MONTH

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12/3/18

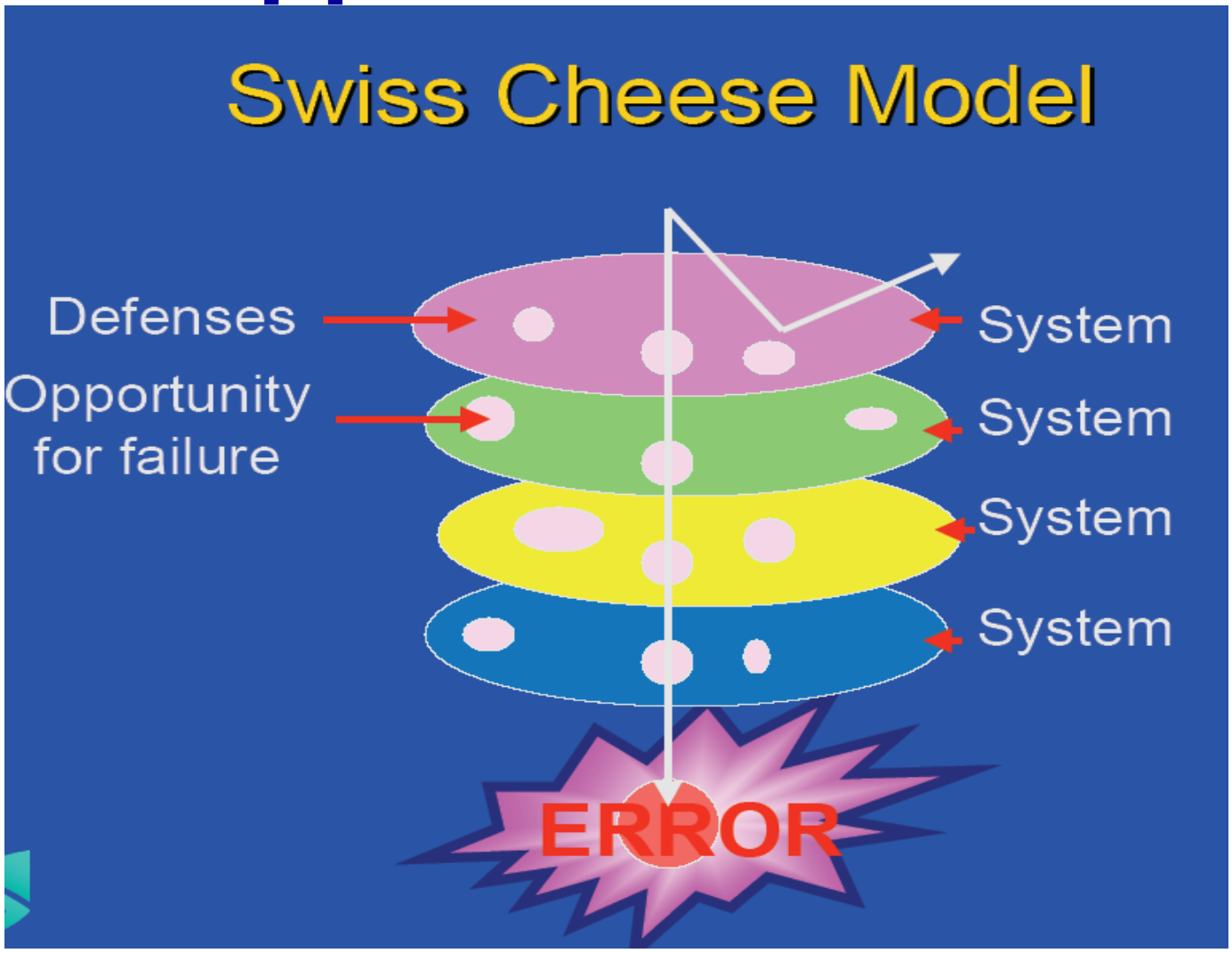
Types of Medical Errors

- **Human Failures**
  - **60–80% of AEs involve human error**
    - **Commission -a blood transfusion to the wrong patient**
    - **Omission-forgetting to give a medication**

> To err is human,
>
> To forgive is divine

- **Systems failure**

Why do medication errors happen?



- Tired Resident
- selects wrong dose
- Distracted pharmacist misses error
- Medication not supplied in unit dose
- Hurried Nurse doesn't recognize error

Why Do Mistakes Happen?

Process factors

- Variable input (diff pts)
- Complexity
- Tight time constraints
- Human intervention

Inconsistency/variation
Too many/complicated steps
Hierarchical culture

People factors

- Inattention/distraction
- Conflicts between staff
- Using past solutions
- Communications errors
- Hard to read handwriting

Unfamiliar situations/new problem
Multiple hand offs
See what we expect to see

System factors

- LASA drugs
- Unnatural workflow
- Floating
- Understaffing

Poorly designed procedures or devices
Confusing instructions
Inadequate labeling/instructions
Unfamiliar situations/problems/designs

Patient Safety Solutions

- **Eliminate/reduce Look-Alike, Sound-Alike Medication Names**
  - **Identify and, at a minimum, annually review a list of look-alike/sound-alike drugs**
  - **Minimize LASA on your formulary**
  - **Drug orders given orally can be misunderstood, especially if they involve a sound-alike drug**
  - **Develop policy for verbal orders**

Safety concerns with telephonic orders

Control High Alert/Risk Medications

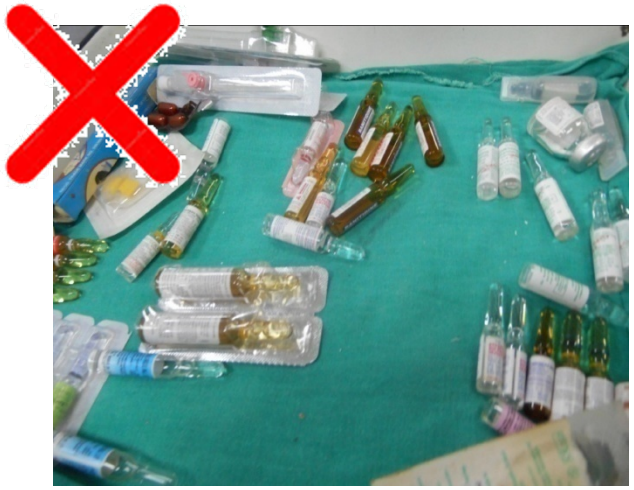
1. **Consider the possibility at time of Formulary addition and annual review.**
2. **Make a list drugs and display prominently at all clinical care locations**
3. **Doubly verify these before dispensing/ administration.**
4. **No verbal orders for high alert drugs except in emergency**
5. **Store in different locations in pharmacies and patient care units.**
6. **Control of concentrated electrolyte solutions & the use of anticoagulation therapy**

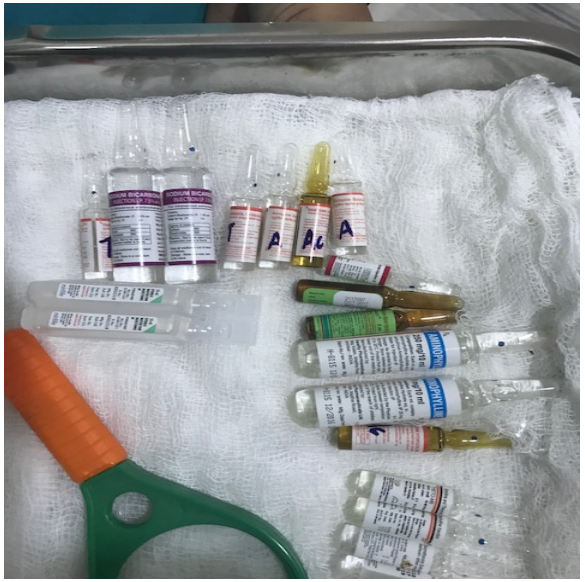
Patient Safety Solutions - Organize Drug store

- Proper drug storage
- Storage environment
- Arrangement of drugs on shelves
- The store room
- The dispensary
- LASA/High Alert- Medicines organizers

Sort and Set
There is a place for everything and everything is in its place

Organize emergency trays/drawers and use identifiers





LASA/High Alert-
Medicines organizers

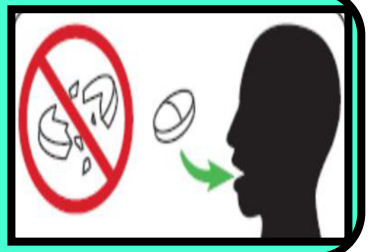
Auxiliary labelling

•Dilute before use

•SHAKE WELL
•BEFORE USING

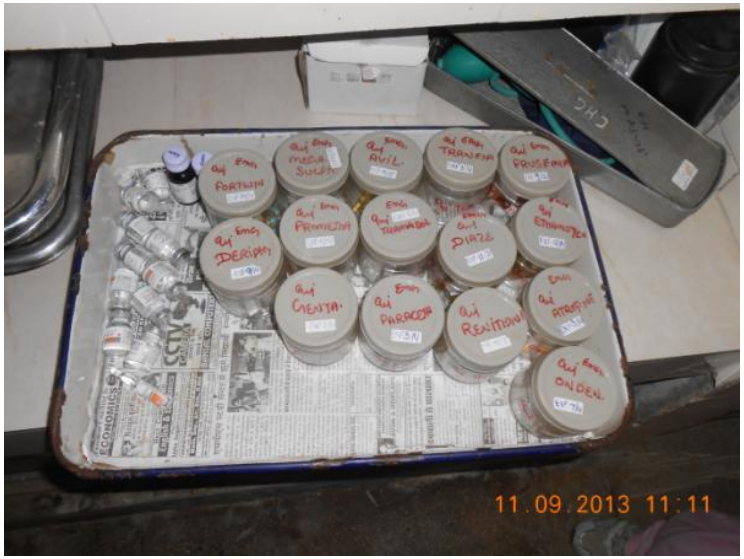
•FOR ORAL USE ONLY

•DO NOT
•CHEW OR CRUSH
• SWALLOW WHOLE



Patient Safety Solutions

- **Label all Medications**
- **Do not remove from original packing as far as possible.**
- **Always label medications:**
  - **In the containers**
  - **once they are taken out of their containers and before dispensing/ administering**
- **Make a note of all Drug Allergies & Write in Bold**



Develop a list of Error prone abbreviations, symbols and dose designations

Abbr	Intended meaning	Misinter-pretation	Abbr	Intended meaning	Misinterpretation
@	at	2	1.0 ml	1ml	10ml
+	Plus/and	4	.5mg	0.5mg	5mg
µg	microgram	mg or ng	10000 units	1,00,00 0	10,000/ 1,000,0 00
IJ	injection	IV	U or u	Unit	0/4
IU	International units	IV	X3d	For 3 days	3 doses
OD	Once daily	Right eye	q1d	daily	4 times daily
10 mg		1 if written poorly	qhs	Nightly at bed time	Qhr or every hour

- The symbols “>” and “<” -<10 mistaken as ‘40’
- Space between drug and strength
  - Tegretol300 mg misread as Tagretol 1300 mg.
  - Inderal40 mg misread as inderal 140 mg
- Abbreviation - mg. or ml. with a period following the abbreviation can be misread as the number if written poorly
- Mixups: between "l" and the number "1; "O" &"0,"; "Z" & "2,"; "1" & "7."
- Use of abbreviations “D/C”, “TCA”, “CST”, or discontinue 1, 2, 5, rest to continue.

Documentation

- **If you do not chart it, it didn't happen.**

Documentation errors, Do's & don'ts

1. **Legible Real time record – properly maintained**
2. **Do not alter notes. Do not temper/obliterate the original note**
3. **If mistake discovered later (inaccurate, misleading or incomplete), insert an additional note as a correction with date.**
4. **For altering cross original words/ statements by a single stroke of pen, so that crossed text is still legible & re-write new one – date & sign both**

0 March 18, 2016

An Unsigned Medical Record has no legal validity- National Commission

Strategies to prevent MEs

- **Optimize the medication process**
  1. **Medication standardization; Simplify – understanding of roles and routines**
  2. **Reduce reliance on memory**
  3. **Technology**
     1. **Computerized physician order entry and clinical decision support**
     2. **Error proofing – duplicate medication entry/dose safety limits/drug –drug interactions**
     3. **Bar code technology**
     4. **Computerized infusion devices**
  4. **Medication reconciliation**
  5. **Eliminate/reduce LASA**
  6. **High alert medicines management**
  7. **Policy for Verbal orders**

MEDICATION WITHOUT HARM
Global Patient Safety Challenge

World Health Organization

5 Moments for Medication Safety

Starting a medication

- What is the name of this medication and what is it for?
- What are the risks and possible side-effects?
- Is there another way of treating my condition?
- Have I told my health professional about my allergies and other health conditions?
- How should I store this medication?

Taking my medication

- When should I take this medication and how much should I take each time?
- How should I take the medication?
- Is there anything related to food and drink that I should know while taking this medication?
- What should I do if I miss a dose of this medication?
- What should I do if I have side-effects?

Adding a medication

- Do I really need any other medication?
- Have I told my health professional about the medications I am already taking?
- Can this medication interact with my other medications?
- What should I do if I suspect an interaction?
- Will I be able to manage multiple medications correctly?

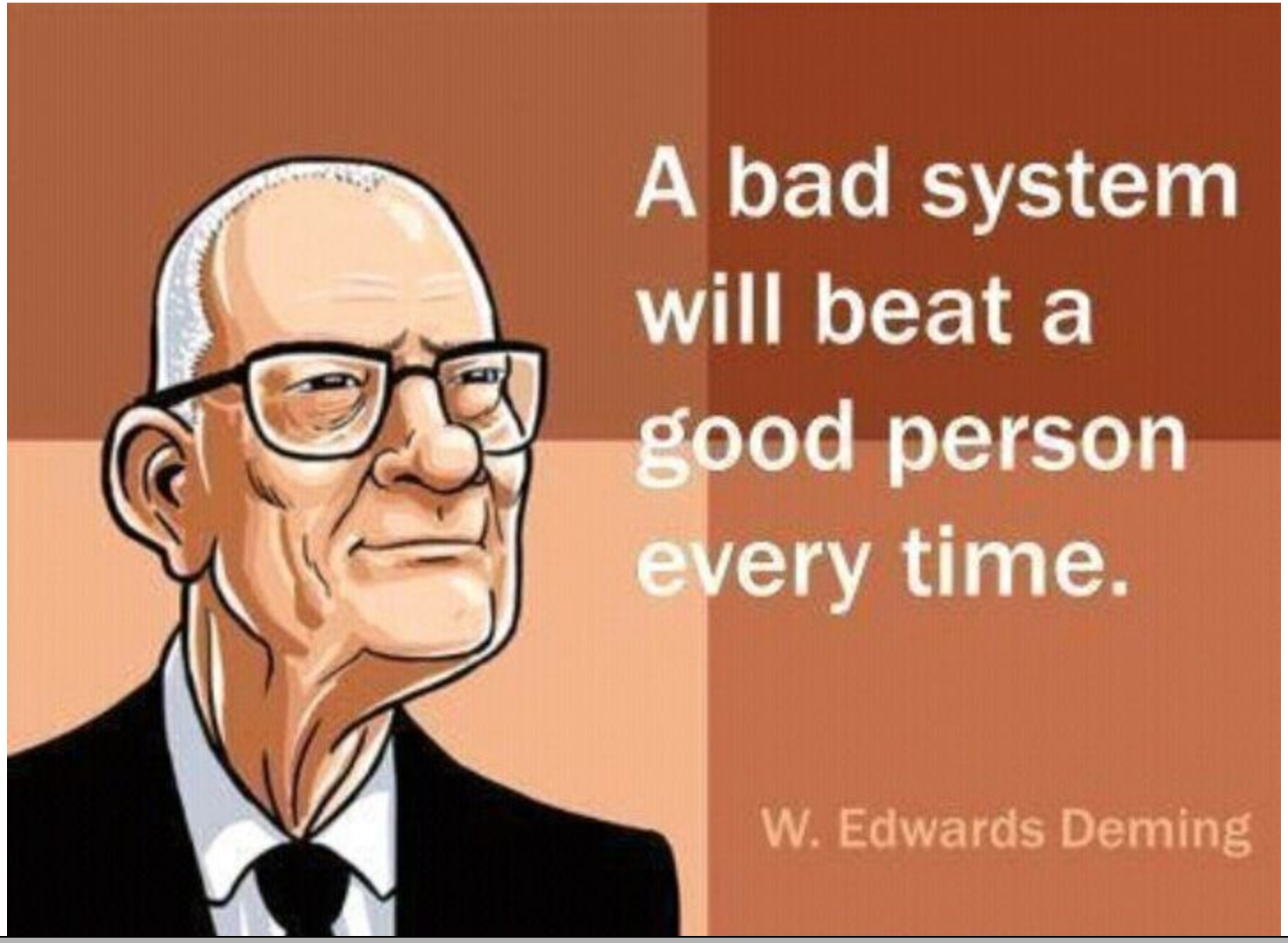
Reviewing my medications

- Do I keep a list of all my medications?
- How long should I take each medication?
- Am I taking any medications I no longer need?
- Does a health professional check my medications regularly?
- How often should my medications be reviewed?

Stopping my medication

- When should I stop each medication?
- Should any of my medications not be stopped suddenly?
- What should I do if I run out of medication?
- If I have to stop my medication due to an unwanted effect, where should I report this?
- What should I do with leftover or expired medications?

- **Empower patients**
- **Monitor Adverse drug reactions**
- **Look for possible drug-drug interactions**



Safe providers provide safe care

Building safer health systems: from blame to opportunity

- There is generally underreporting and what is reported is often the tip of the iceberg.
- Voluntary reporting system
- Critical incident/ Root Cause analysis
- Blame free health systems –
- Learn and share experiences
- Develop a culture of safety

- **To err is human,**

  To forgive is divine

- **To err is inhuman**

  To prevent error is divine

Medications are great tools……

Use hem wisely and safely