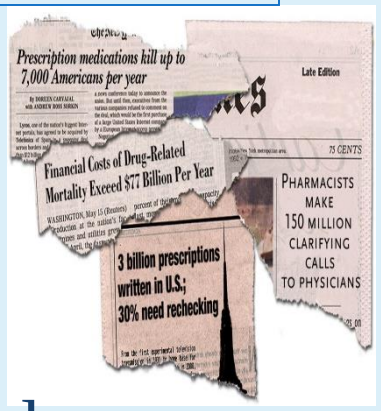
PATIENT SAFETY & INFORMATION TECHNOLOGY

Ms. Pay Soklim, RN, BSN, MSc GHD

Errors and ADEs are costly



Adverse Events in USA Hospitals:

- 80,000 people hospitalised/year
- 7,000 deaths/year.
- 50% of these errors definitely or possibly preventable
- $22 billion, costs of preventable adverse event

(1999 USA Institute of Medicine Report)

Errors and ADEs are costly

At least 1.5 million preventable ADEs occur each year in the US:

- *Hospital:* 380,000-450,000.
- *Ambulatory Care:* 530,000
- *Long-term care:* 800,000

Cost of ADE

- Non-preventable ADE: $2,595
- Preventable ADE: $4,685

Bates DW et al . *JAMA. 1997*

Errors and ADEs are costly

In Holland (2005):

- **E**ach year 10,000 people receive wrong medication and more than 3000 death each year because of errors.

In Australia:

- Medical error results in as many as 18 000 unnecessary deaths, and more than 50 000 patients become disabled each year.
- AU$ 5 Billion (AUS)

Medication Errors

- nearly 1 of every 5 doses in the typical hospital and skilled nursing facility.
- The percentage of errors rated potentially harmful was 7%, or more than 40 per day in a typical 300-patient facility.
- The problem of defective medication administrations systems, although varied, is widespread.

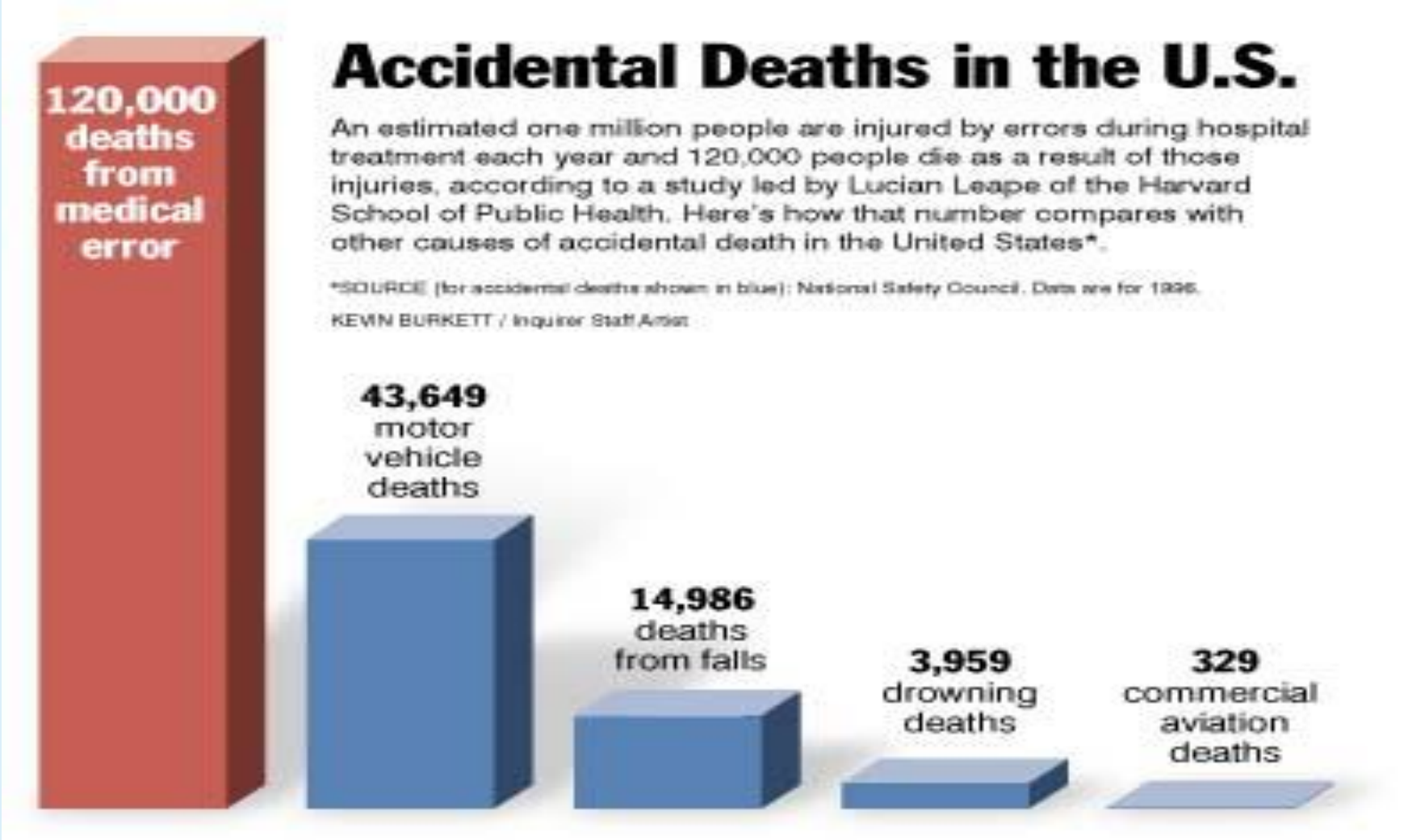
Medication Errors Observed in 35 Health Care Facilities
Kenneth N. Barker, PhD; Elizabeth A. Flynn, PhD, et al.
(REPRINTED) ARCH INTERN MED/VOL 162, SEP 9, 2002 2002 American Medical Association

Adverse Events -International information

	AE's	Preventable
Baker et al, Canada 2000	7.5%	36%
Thomas et al, Utah Colorado 1992	2.9%	--
Wilson et al,* Australia, 1995	16.6%	51%
Thomas et al, 2000, reworked 1995 Australian data	10.6%	--
Brennan et al, Leape et al, New York 1984	3.7%	--
Vincent et al, London 1999,2000	10.8%	48%
Davis et al*, New Zealand 1998	12.9%	37%

* Slight to modest evidence of healthcare management causation = 2 out of 6 scale, other papers management causation more certain:- 4 out of 6 scale

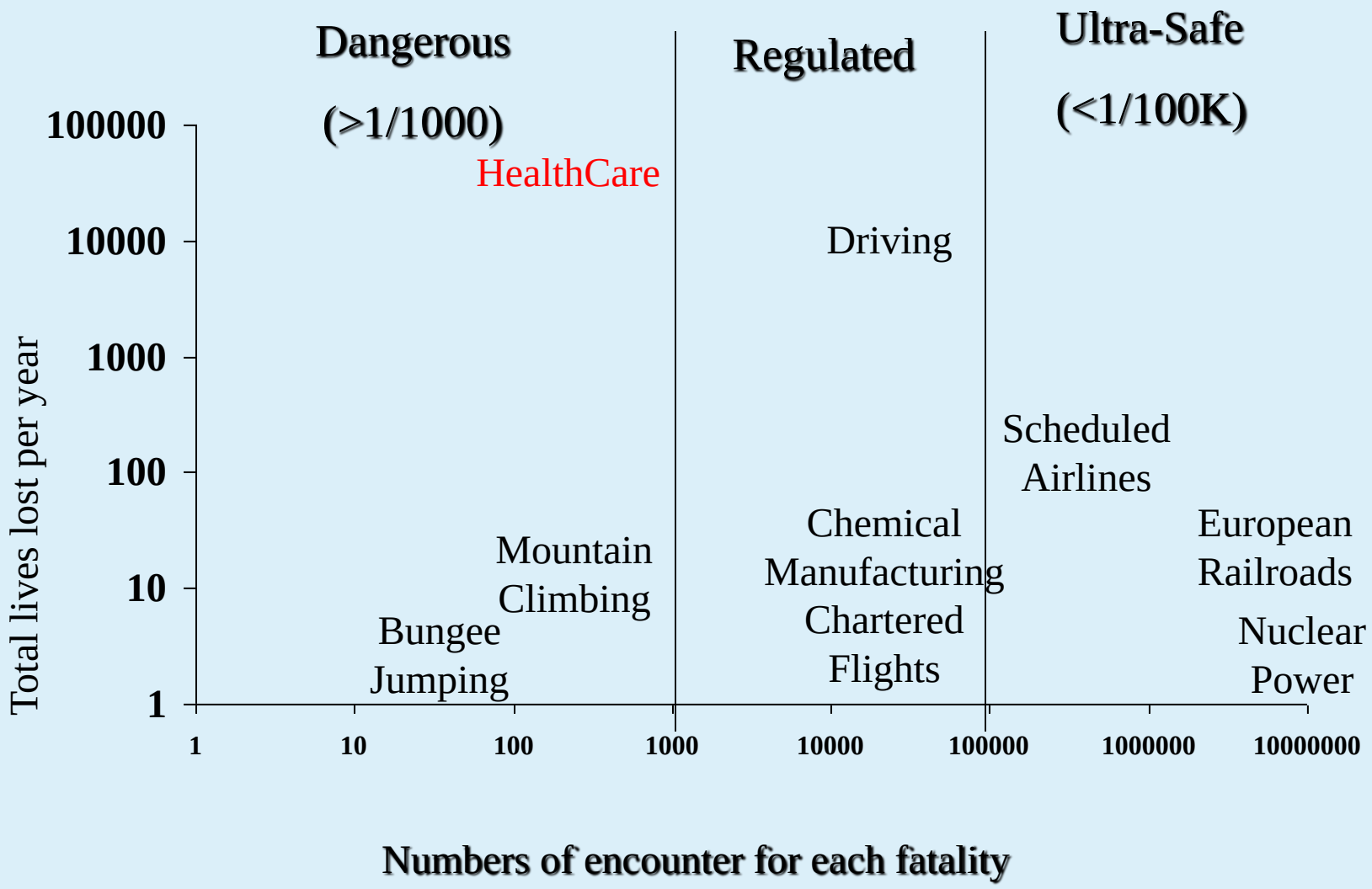
Estimated Deaths Due to Medical Error



Source – The Philadelphia Inquirer

How Hazardous Is Health Care?

(Modified from Leape)



Definitions:

……**Patient safety** defined as freedom from accidental injury due to medical care…..

Institute of Medicine. To Err is Human. Building a safer Health System, Washington, National Academy Press: 1999

An adverse events: harm or injury caused by the management of a patients' disease or condition by health care professionals rather than by the underlying disease or condition itself……

The World Health Profession Alliance

Errors Types (another classification)

Overuse

in 2001 top 50 medical and surgical procedures numbered 42 million. 7.5 million of these were unnecessary surgical procedures – causing about 40,000 deaths.

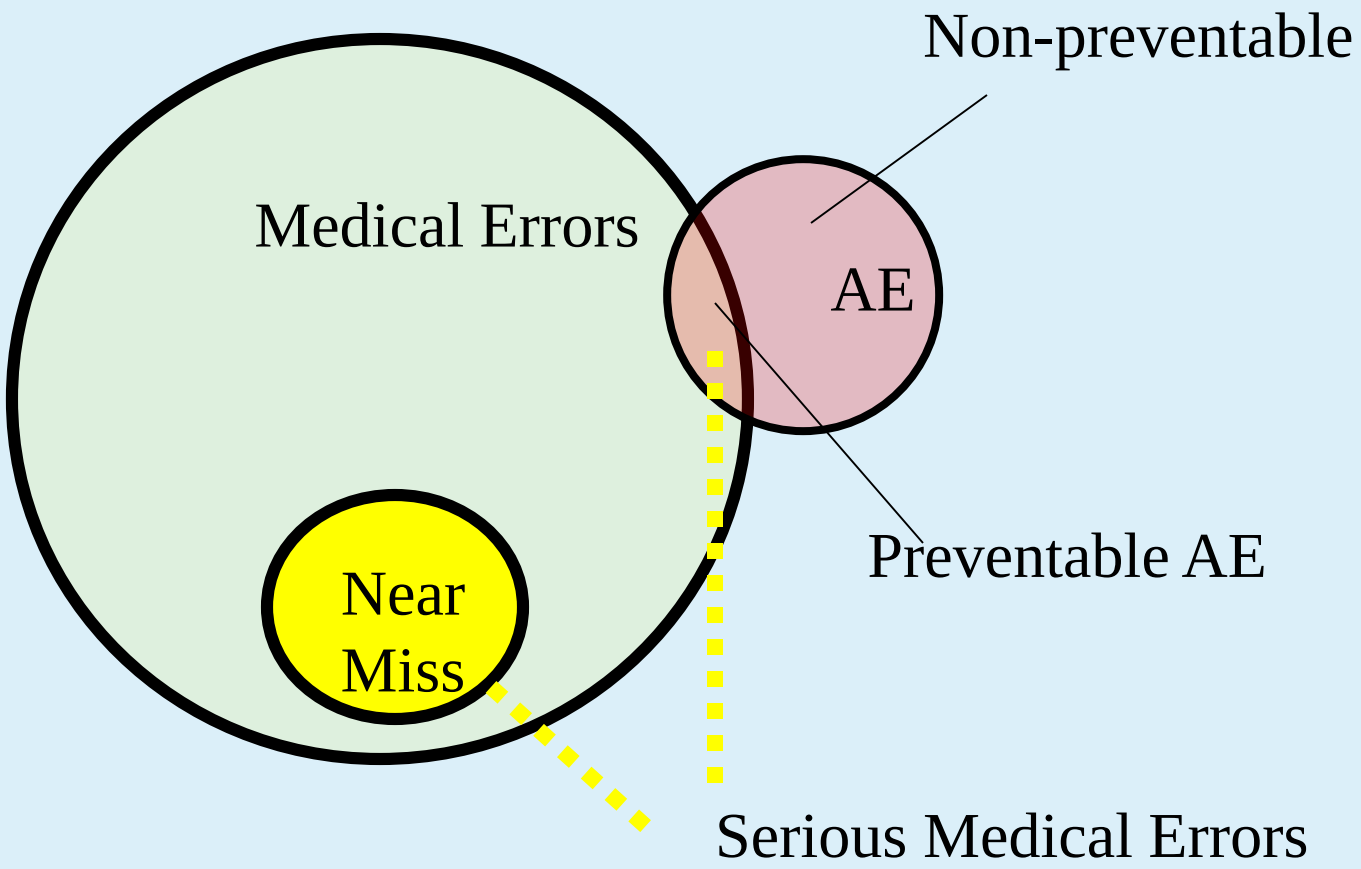
Underuse

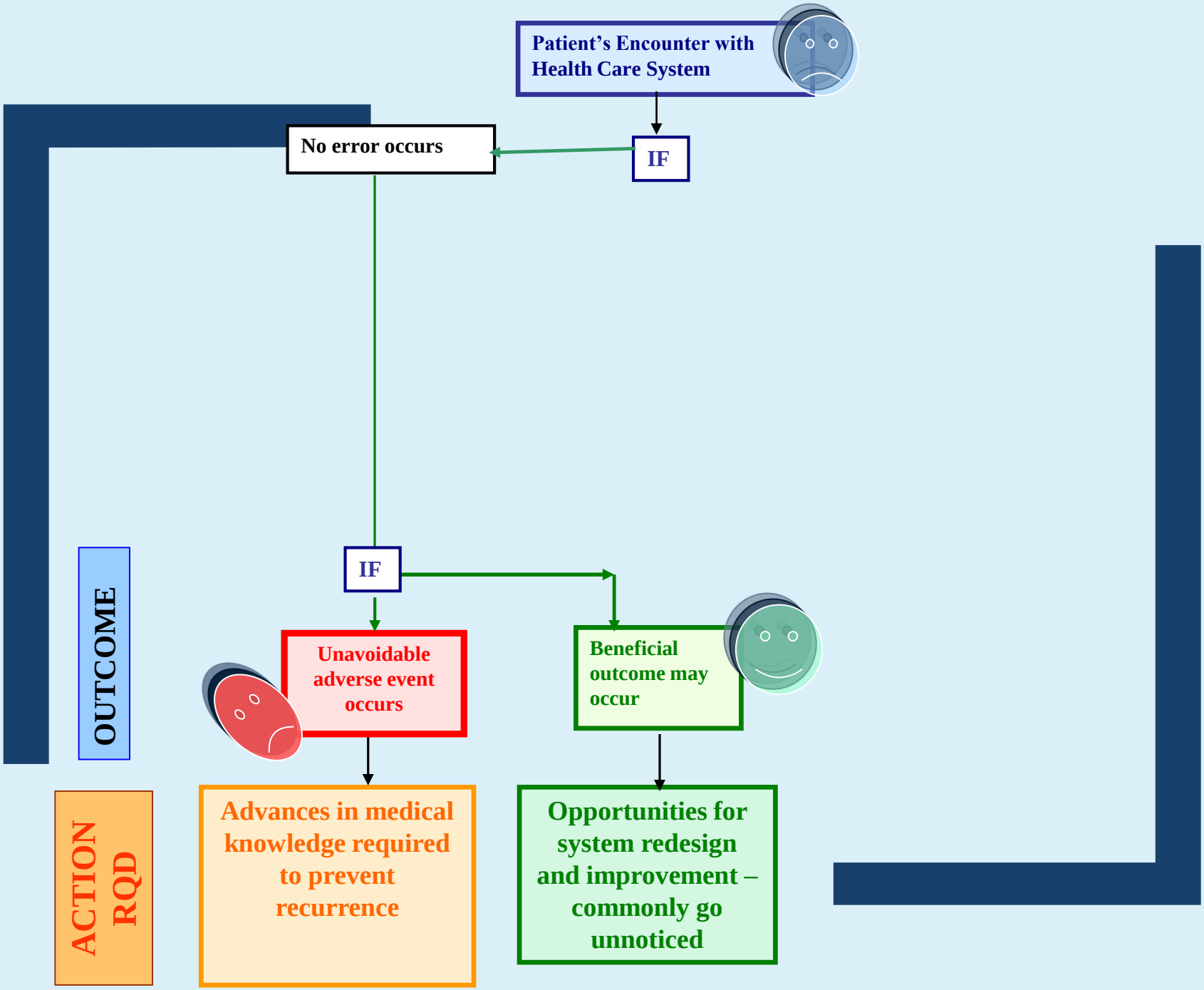
Much greater problem than Overuse. Patients failed to receive recommended care about 46% of the time. e.g. hypertension receives 65% of recommended care.

Misuse

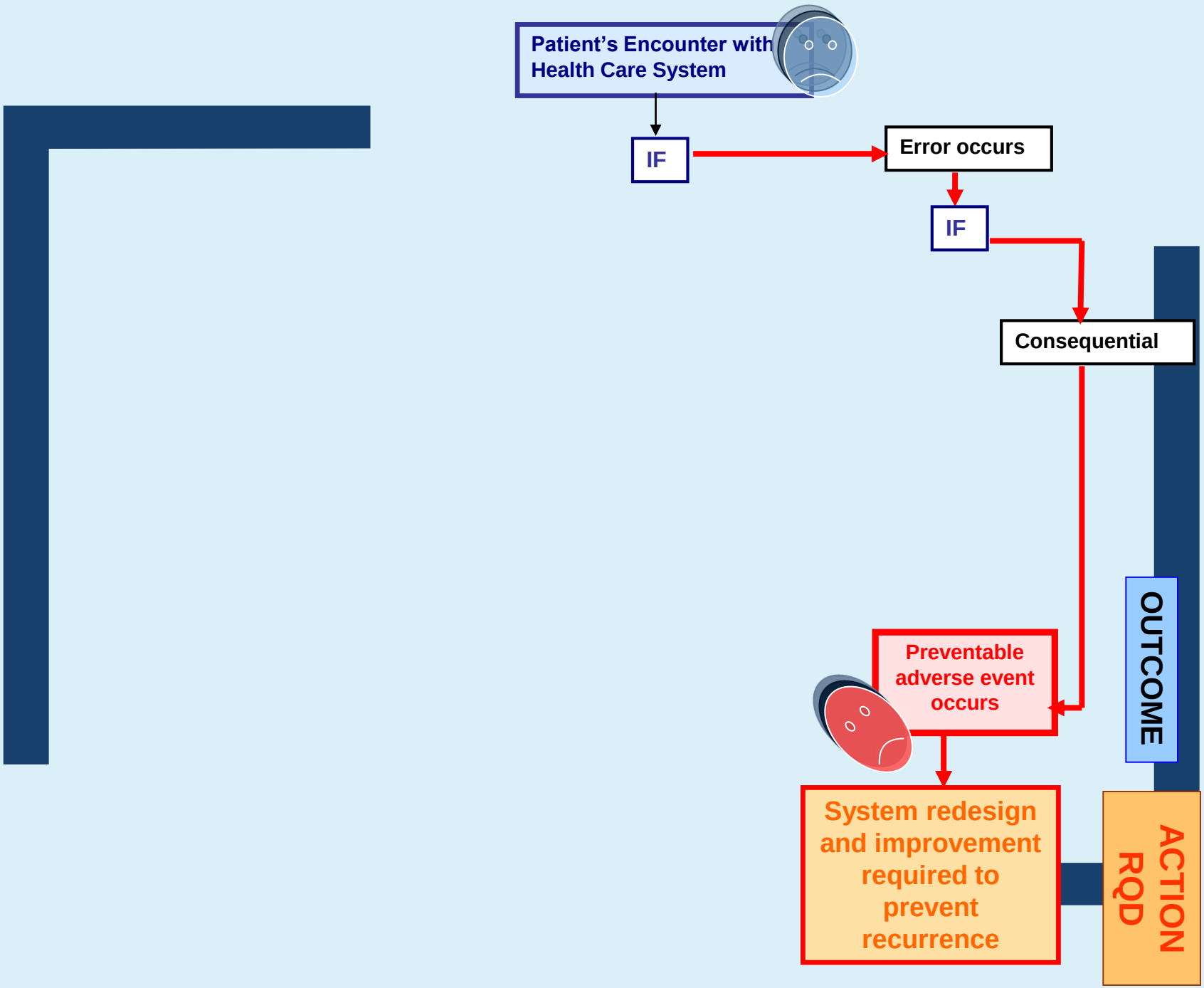
About 11% of the time patients receive care not recommended – leading to harm

Medical Errors & Adverse Events





A, R & G Singh 2002



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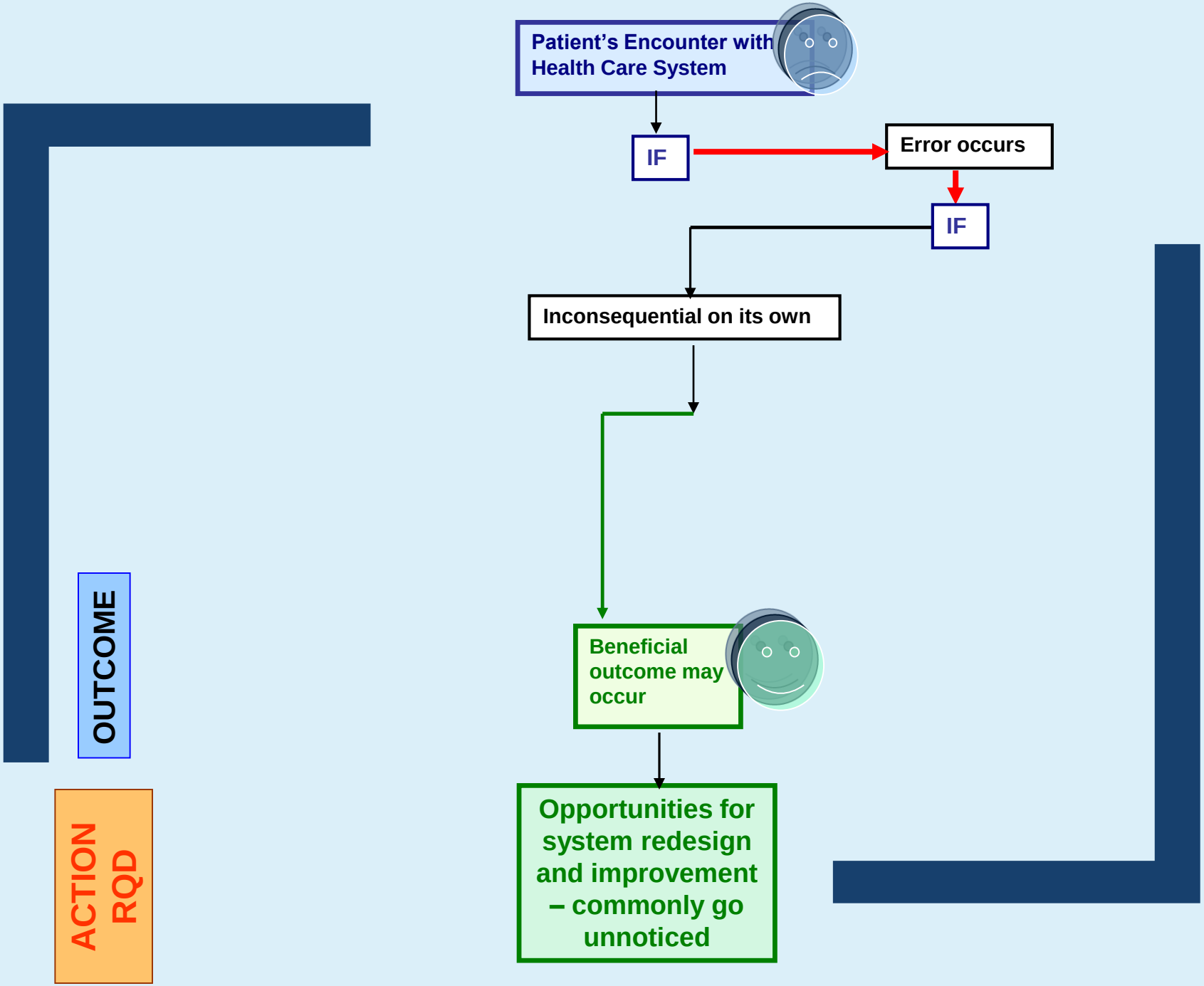
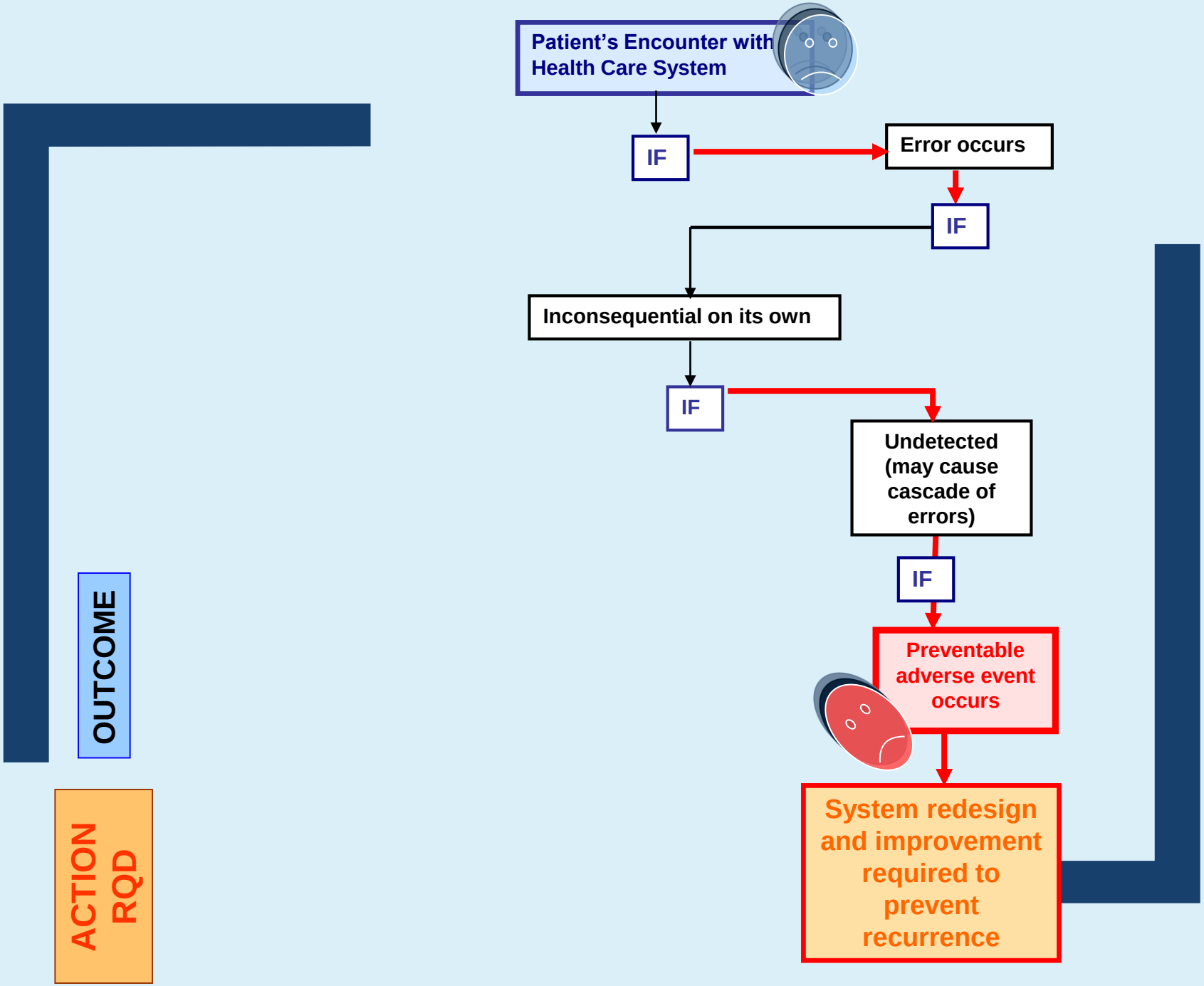


A, R & G Singh 2002



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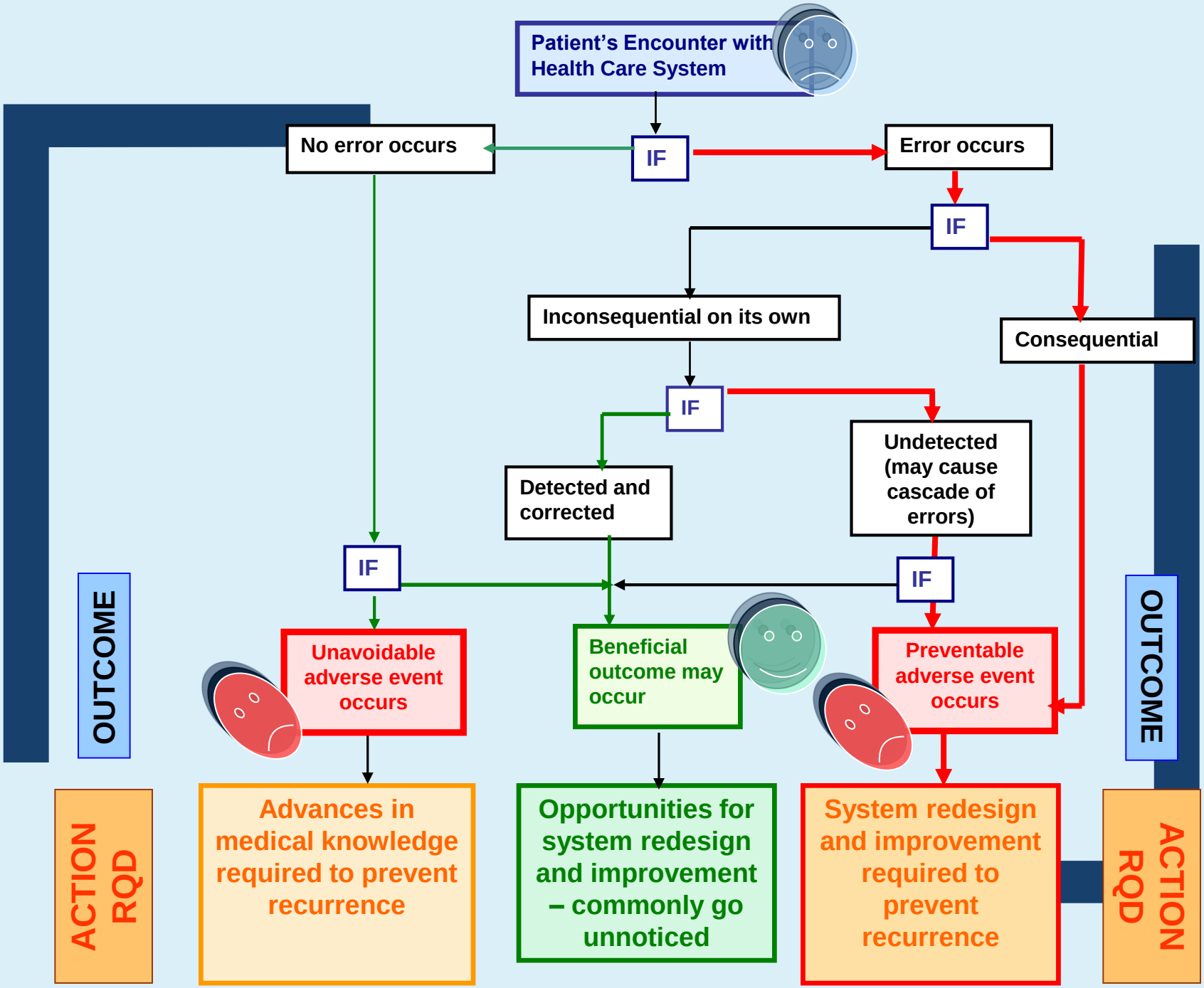
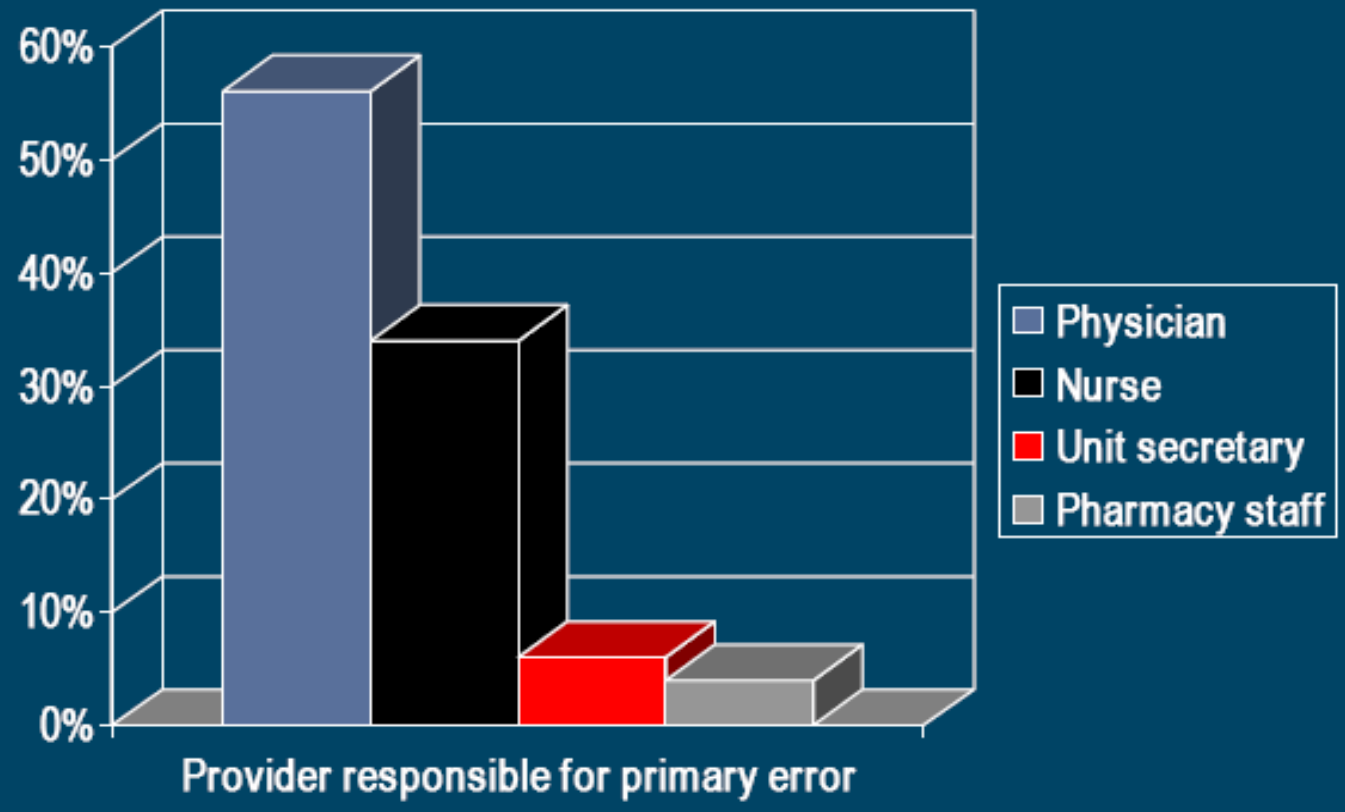
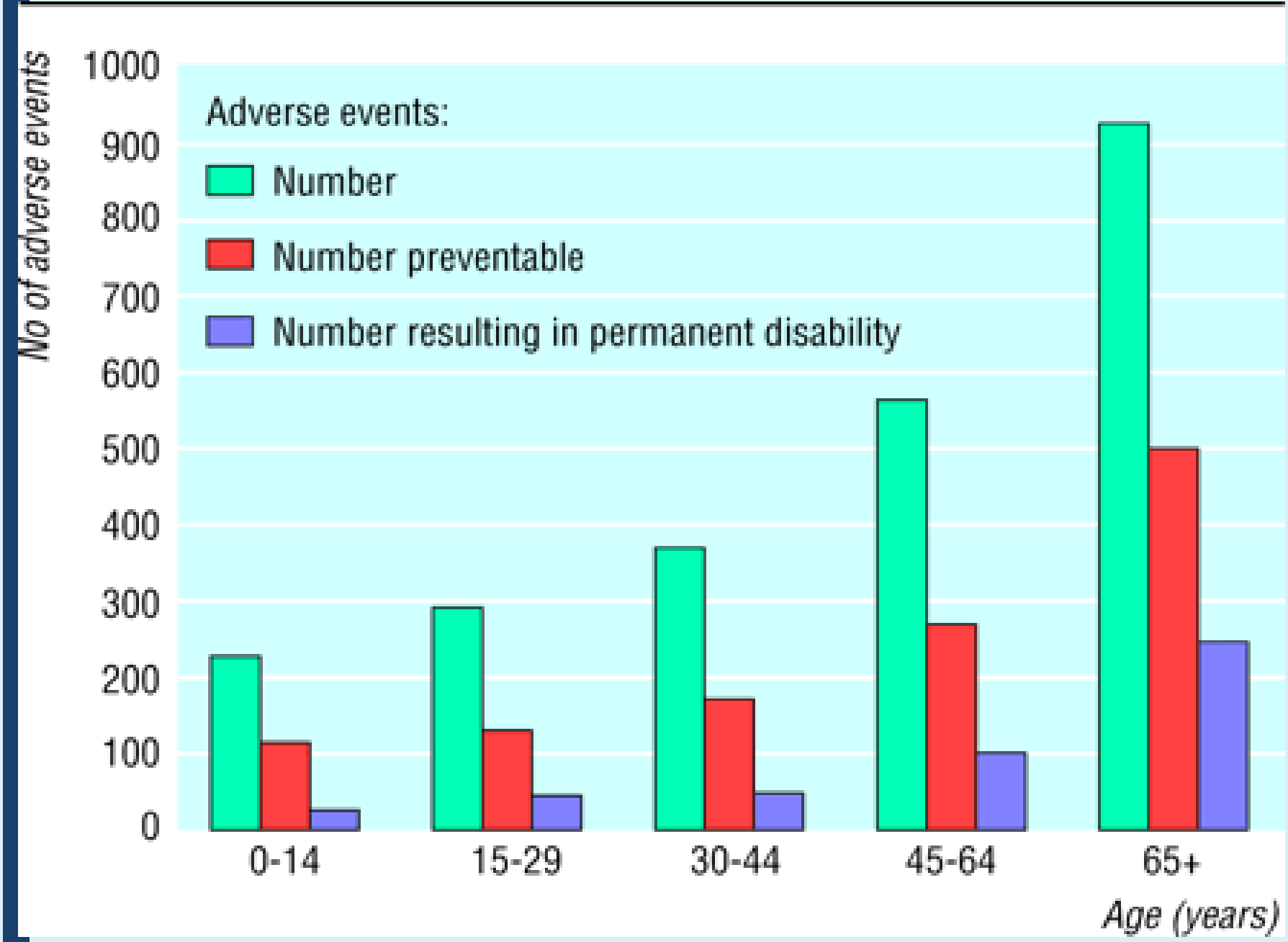


A, R & G Singh 2002

Where do ADEs 'come from'?



Source: The Advisory Board



Richard Smith

“Knowing is not enough; we must apply. Willing is not enough; we must do.”

Wolfgang von Goethe

How to think of error?

- **An individual failing**
  - *It will not solve the problem--it will probably in fact make it worse because it fails to address the problem*
  - *Doctors will hide errors*
  - *May destroy many doctors inadvertently (the second victim)*
- **A systems failure**
  - *This is the starting point for redesigning the system and reducing error*

James Reason's bottom line

- Fallibility is part of the human condition
- We can't change the human condition
- We can change the conditions under which people work

Good Outcomes, Good Systems

• Historically, mistakes or poor outcomes have been blamed on "dumb doctor," or "dumb nurse." The "solution" was the ABP reaction – Accuse, Blame and Punish.

• But inefficiencies and errors mostly can be traced not to one error, but a cascade of poor or poorly executed procedures, policies, technologies and training. A good system will provide a good outcome; a poorly designed one will produce a poor one.

•We need to design health care systems that put safety first (First, do no harm)

Hopkins Medical News, Edward D. Miller, M.D., Fall 2002, Page 56

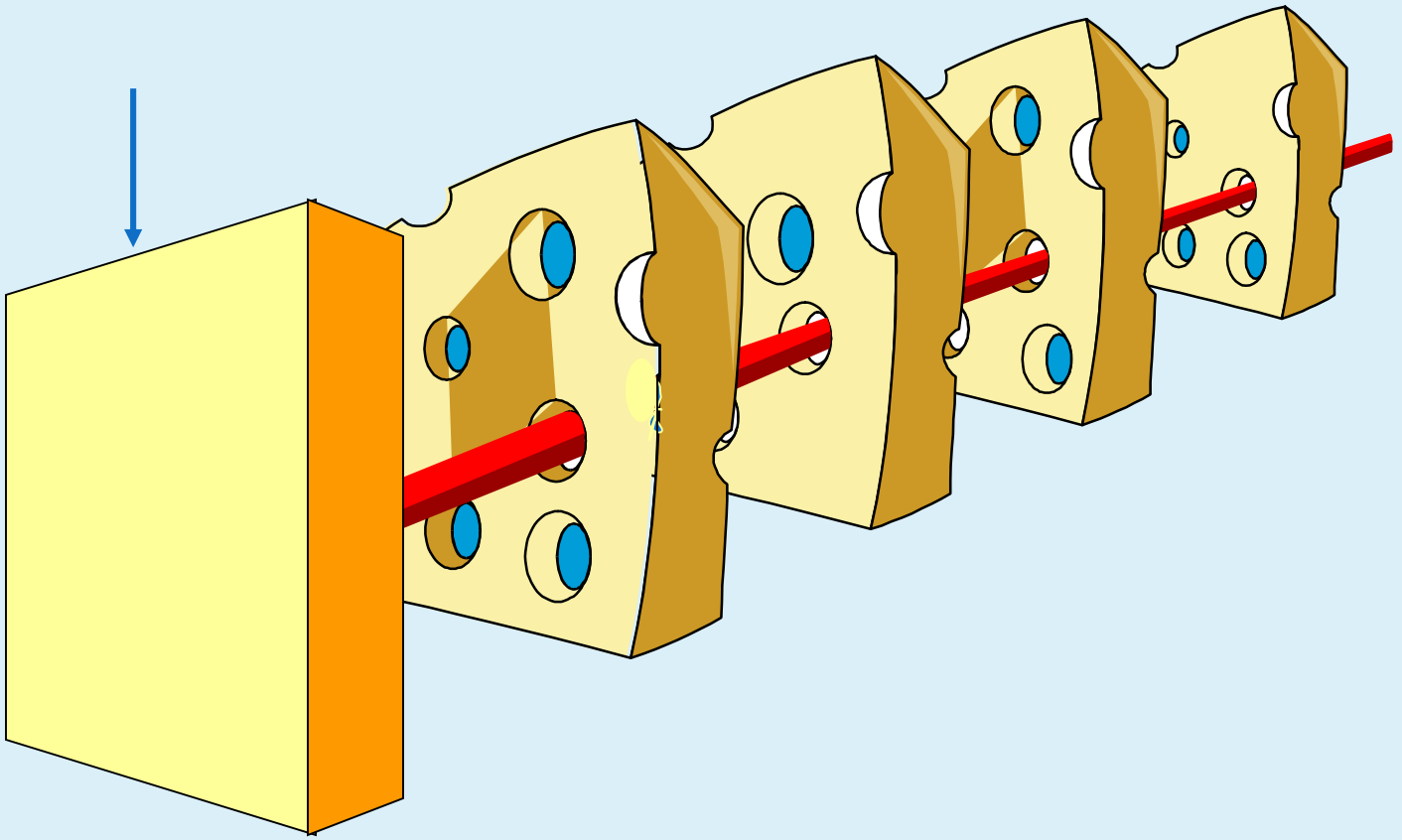
A System Problem

"…adverse events are generally not the result of one thing that went wrong. They result from the combination of a series of latent errors that are built into the system."

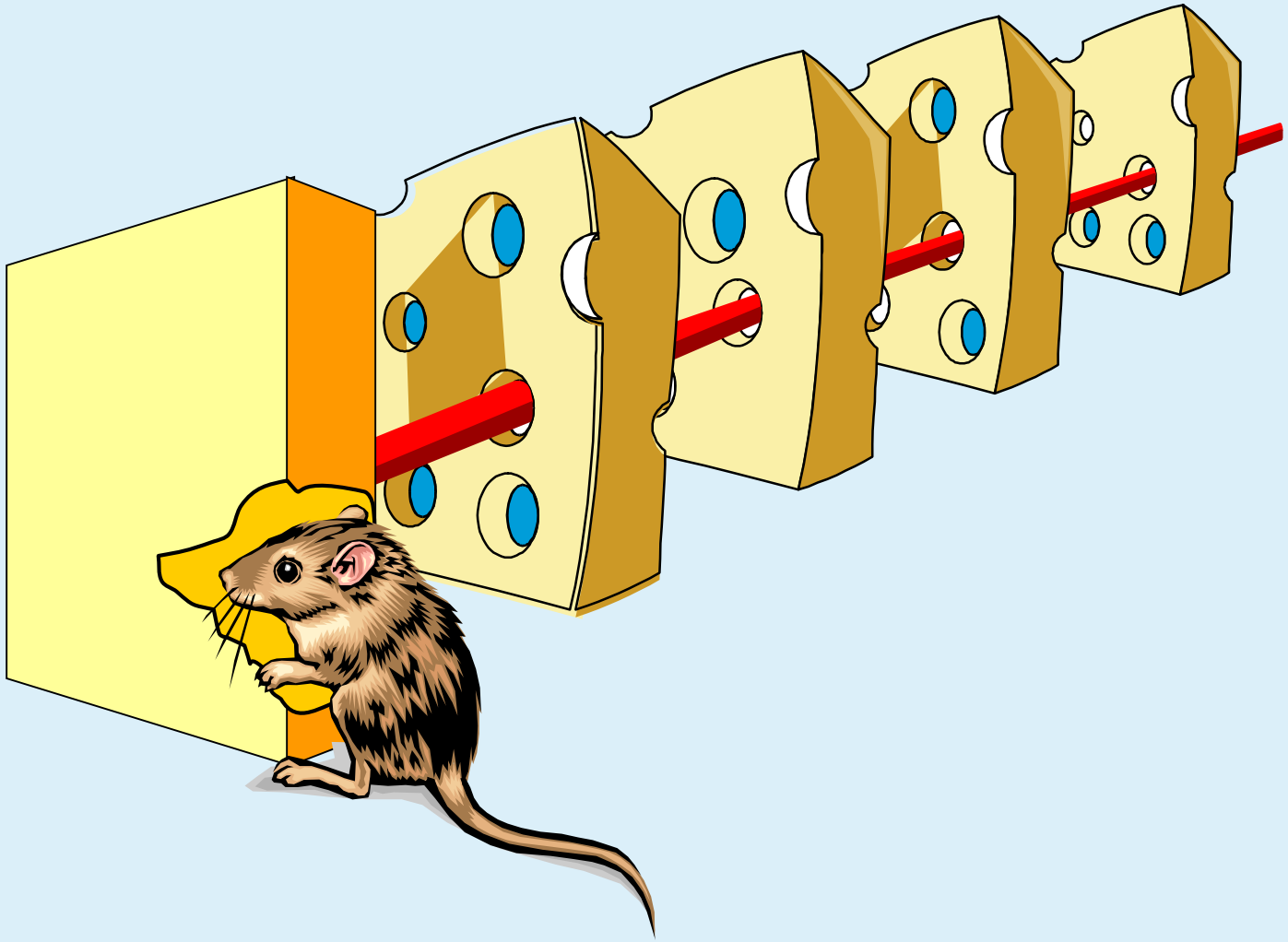
Paul M. Schyve, MD, Vice President, JCAHO In: Reducing Medical Errors, Improving Patient Safety: Taking the Next Step, HealthLeaders Roundtable, June 2001.

‘Swiss cheese’ model

SAFETY BARRIERS



Be careful!



Theory of Constraints

- Any improvement is a change
  - *not every change is an improvement*
  - *but we cannot improve something unless we change it*

Goldratt (1990)

Any improvement is a change

- any change is a perceived threat to security
  - *there will always be someone who will look at the suggested change as a threat*
- any threat to security gives rise to emotional resistance
  - *you can rarely overcome emotional resistance with logic alone*
  - *emotional resistance can only be overcome by a stronger emotion*

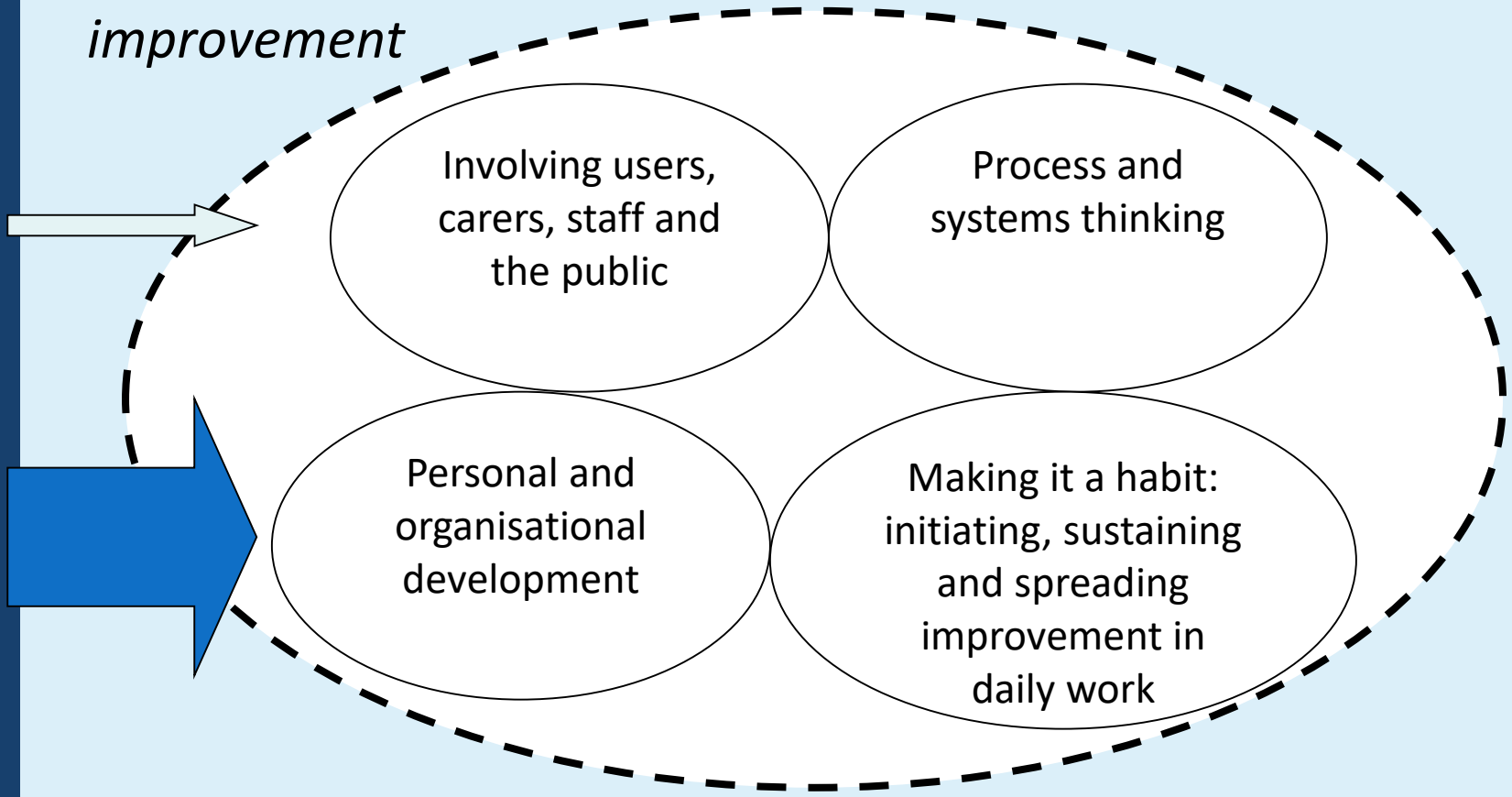
Goldratt (1990)

"Anyone who thinks you can overcome emotional resistance with logic was probably never married"

Involve the nurses

Discipline of Improvement

4 equally important parts of improvement



Vision: Every single person is capable, enabled and encouraged to work with others to improve their part of the service

Discipline of improvement in health and social care (Penny 2003)

Safety Principles

- Error prevention
- Making errors visible
- Mitigation of harm from errors

- “No problem can be solved within the same consciousness which caused it.”

  Albert Einstein

- “Since modern information tools can do things that the unaided human mind cannot do, when we use such tools we may see a picture of medicine we have not seen before.”

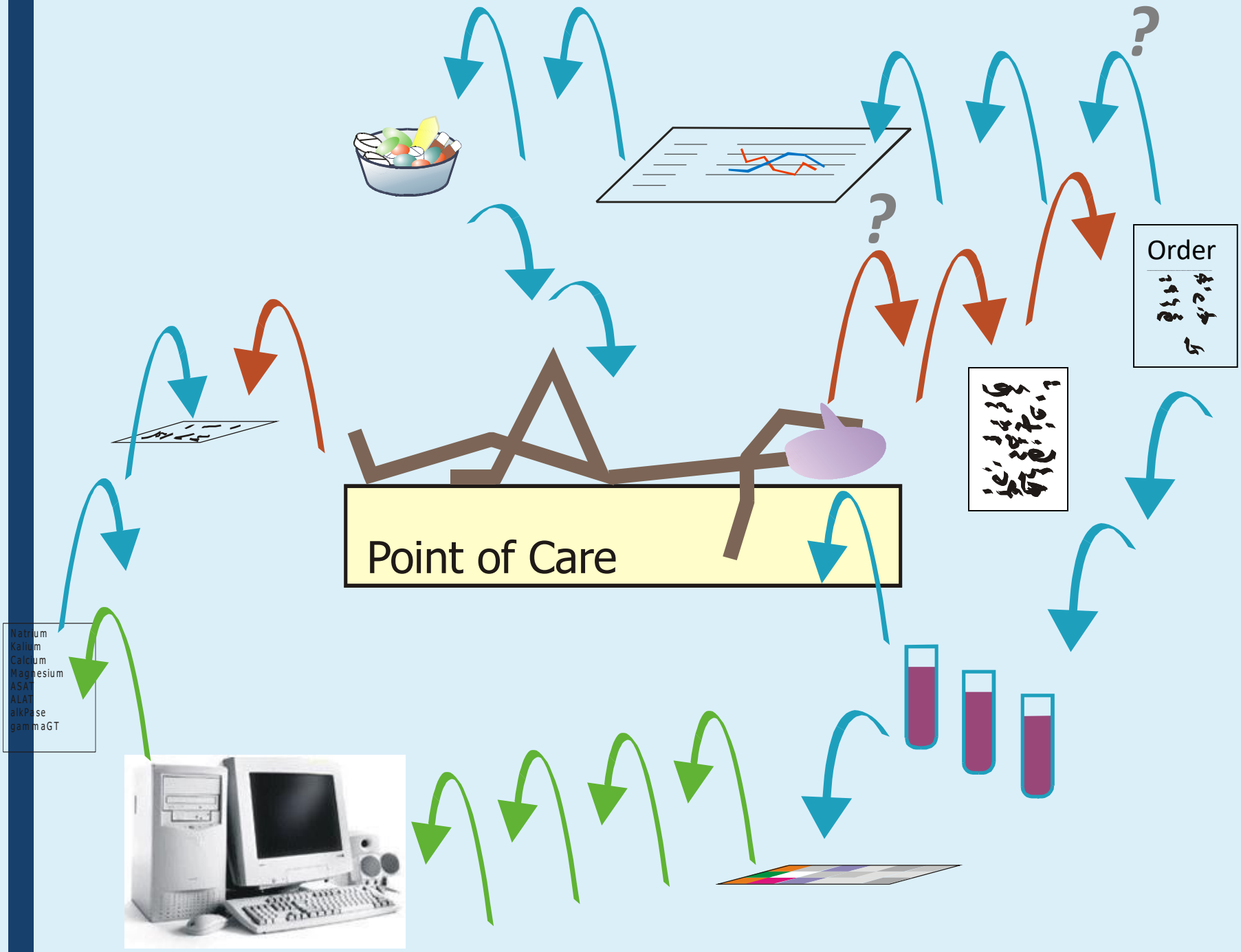
  Larry Weed

- “…there are enormous ‘voltage drops’ along the transmission line for medical knowledge.”

  Lawrence Weed (1997)

Information Technology to Improve Patient Safety

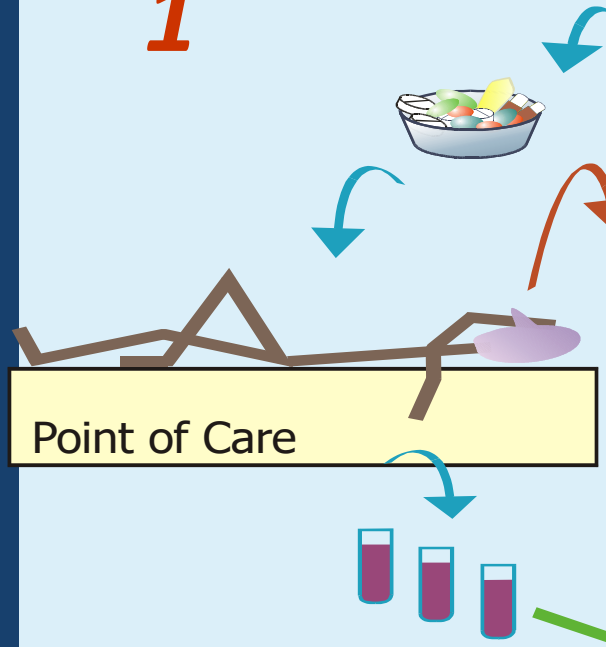
- Electronic medical records (EMR)
- Electronic orders and prescribing: Computerized Physician Order Entry (CPOE)
- Electronic decision-support tools
- Handheld devices (PDAs)
- The electronic office


Order
Point of Care
Natrium
Kalium
Calcium
Magnesium
ASAT
ALAT
alkPase
gammaGT

3

Dose calculation
- single dose
- dosing intervall
- divisibility

1



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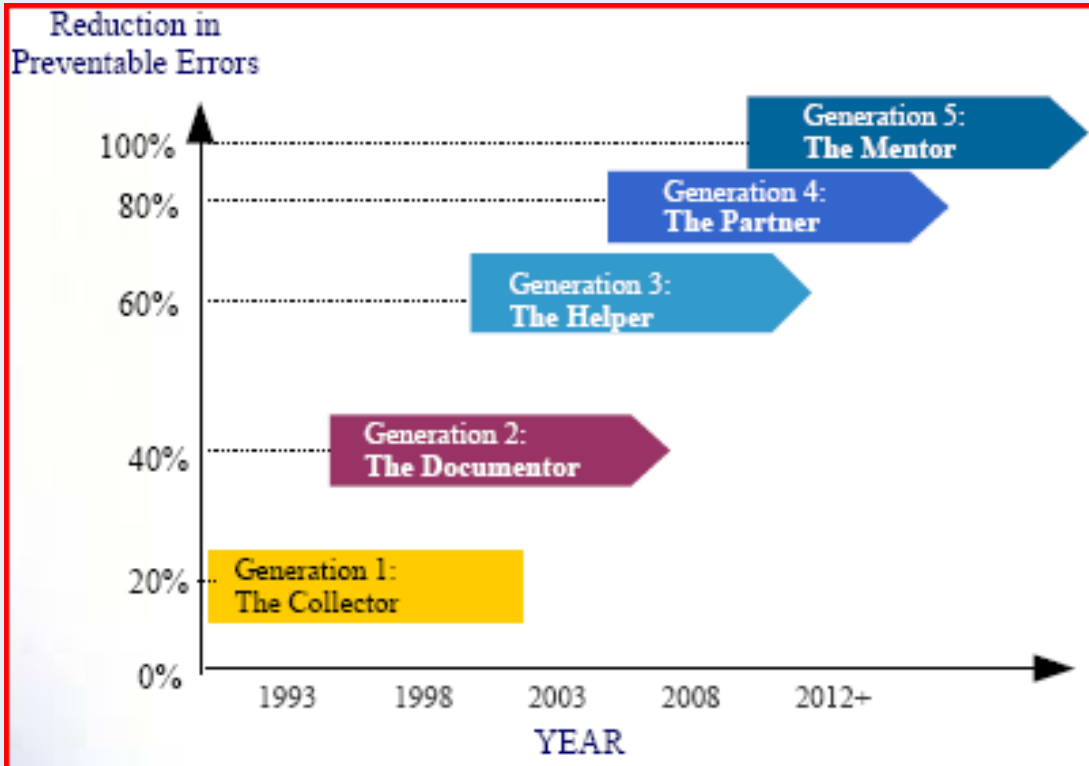
Watchdog
- renal failure?
- special dose requirements?
- Contraindications?

Drug data base
- local formulary
- common thesaurus



Prepared by the Gartner Group, Inc.
See paper, "Leveraging IT to Improve Patient Safety"
Garets/Ball/Handler (in press, IMIA Yearbook 2003)

Generation I

- Create a clinical data repository

consolidation key clinical data

- From this database, information can be

located efficiently and reliably

Generation I = 15% reduction in preventable errors

Generation II

- Implementation of basic clinical decision support systems (CDSS) **- a key for eliminating errors**

GI (15%) + GII (25%) = 40% reduction in preventable errors

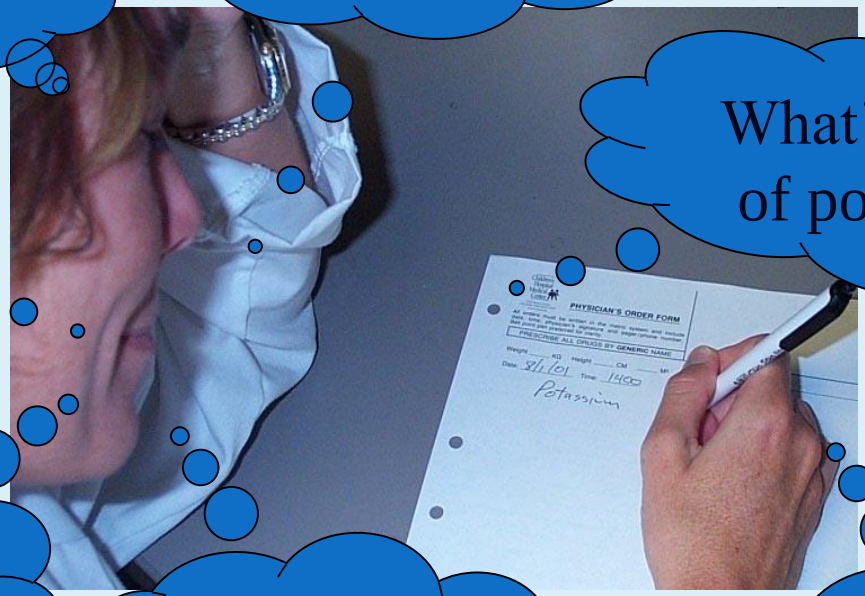
Reducing Haphazard Decisions

What's the last Potassium ?

What does this child weigh ?

Is there a policy ?

What's the dose of potassium ?



Where are the chart & blue card ?

How fast can I give this drug ?

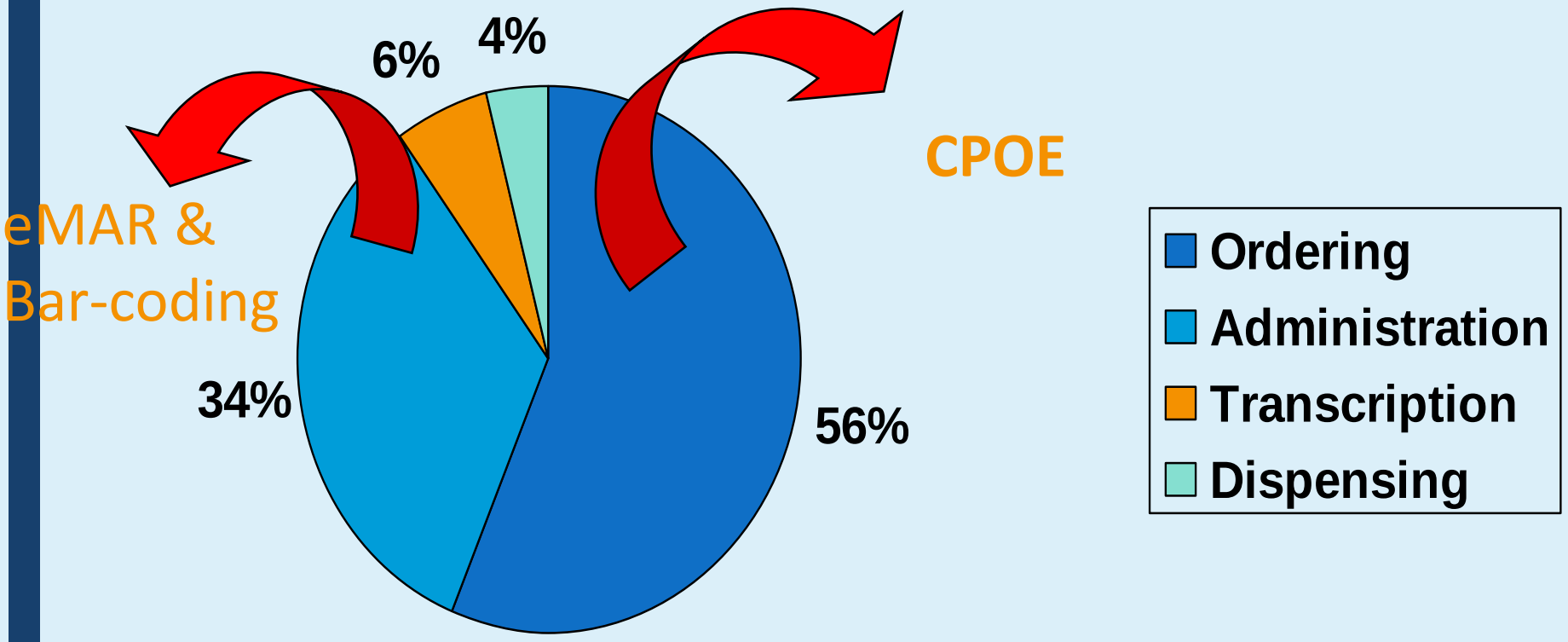
Protection from Overdose?

Generation III

- Combining CDSS across the continuum of care (in and out patients)
- Use of controlled medical vocabulary to normalize medical concepts
- CPOE (to better manage ordering)
- Work flow improvements
- Combining work flow change and CDSS
- This 3rd generation has the basic infrastructure to measure or asses incidence of potential errors and measure effectiveness of interventions

GI (15%) + GII (25%) + GIII (30%) = 70% preventable error.
IOM goal of at least a 50% reduction of preventable medical errors

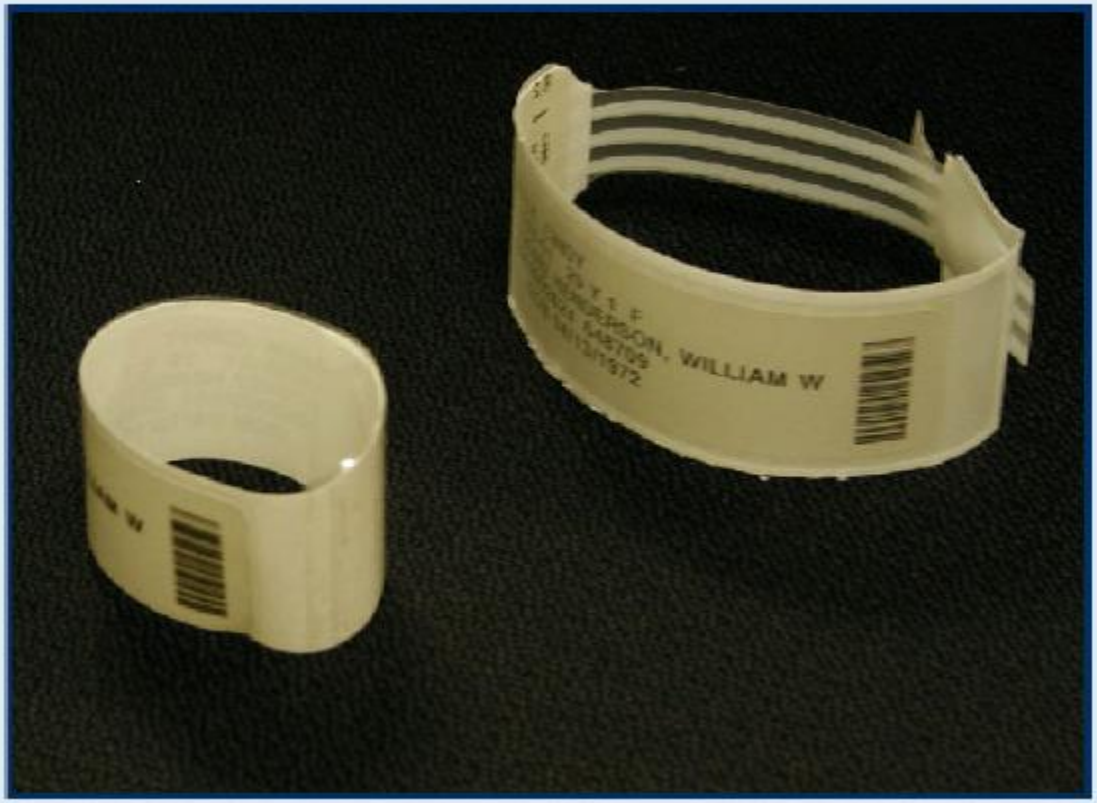
Errors resulting in ADEs: Harvard Study



Bates DW et al. Incidence of adverse drug events and potential adverse drug events. JAMA 1995;274:29-34.

Bar Coding and Repackaging

Bar Coding and Repackaging




I'M WORRIED THAT HEALTH CARE HAS BECOME TOO IMPERSONAL, DOC.
NONSENSE... JUST RELAX AND LIE BACK ON THE BAR CODE SCANNER.
22299 01055
ROHR

Generation IV

- More sophisticated CDSS
- Tailored care to the individual patient
- Disease management tracking
- Protocols (Care management, Clinical)
-

GI (15%) + GII (25%) + GIII (30%) + GIV (20%) = 90% preventable error.

Generation IV

After the next decade 2010

- Highly sophisticated CDSS
- True evidence-based medicine
- Outcomes tracking of each episode of care
- Links to NLM and new medical research results from the medical literature
- Interfaces to mobile personal monitoring devices
- Personalized accessible patient record information anywhere

Technology Adoption, Change!

No. of years for 30% of Americans to own technology:

- Telephone 40 years
- Television 17 years
- PC 13 years
- Internet 7 years

D.Z. Sand, HIMSS presentation 2002, Cambridge Technology Partners

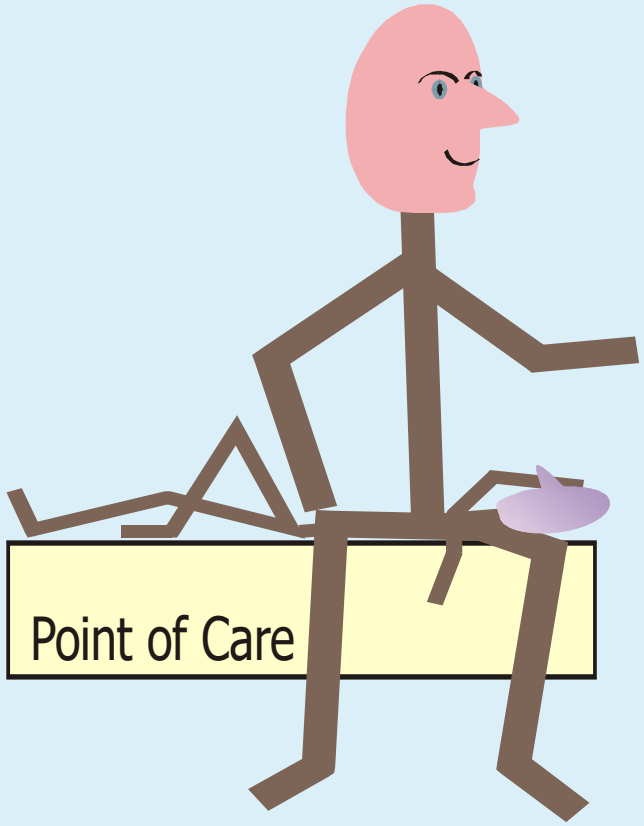
Thermometers

"Physicians had always avoided applying mathematics to the study of the body or disease. In the 1820's, 200 years after the discovery of thermometers, French clinicians began using them."

The Great Influenza, John M . Barry p25

Main Barriers

- Physicians were taught to be independent and have been resistant to guidelines and systems
- Physicians view teamwork as golf teams not volleyball teams
- Disruptive behavior has been tolerated and in some respects rewarded among physicians


Point of Care