OBSTETRICS
Can we become a high reliability profession?

New Jersey Hospital Association

March 5, 2009

High Reliability Organization

One that experiences fewer than expected errors/accidents despite an inherently risky environment

INSTITUTE OF MEDICINE REPORT - 1999

44,000-98,000 PEOPLE DIE EACH YEAR IN THE UNITED STATES DUE TO PREVENTABLE MEDICAL ERRORS

HealthGrades Report 2000-2002

Actual avoidable deaths are probably twice as high

Medical errors rank behind heart disease and cancer as leading cause of mortality in the United States.

Did not count deaths due to errors in offices or nursing homes

WHO IS AT GREATEST RISK FOR RECEIVING POOR-QUALITY HEALTH CARE?

NEJM March 16, 2006

GOOD NEWS: WE HAVE ELIMINATED VARIABILITY DUE TO RACE, AGE AND GENDER

BAD NEWS: EVERYONE GETS EQUALLY MEDIOCRE HEALTH CARE – 54.9% GET RECOMMENDED CARE

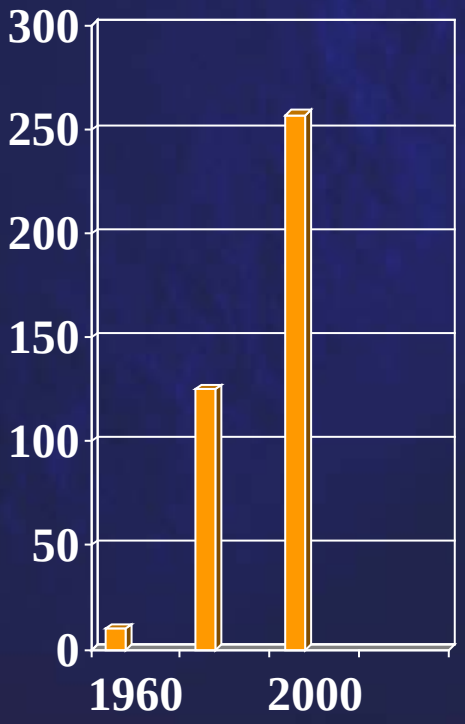
No decrease in decades in:

- Cerebral palsy
- Brachial plexus injury
- Maternal mortality
- Preterm birth
- Cesarean delivery rate

- We rank 47th in Perinatal Mortality Rate

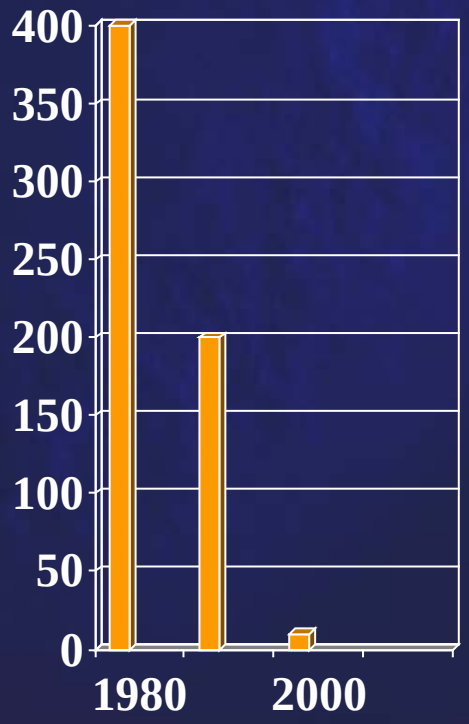
Medical Errors

- Medical errors have increased 257%

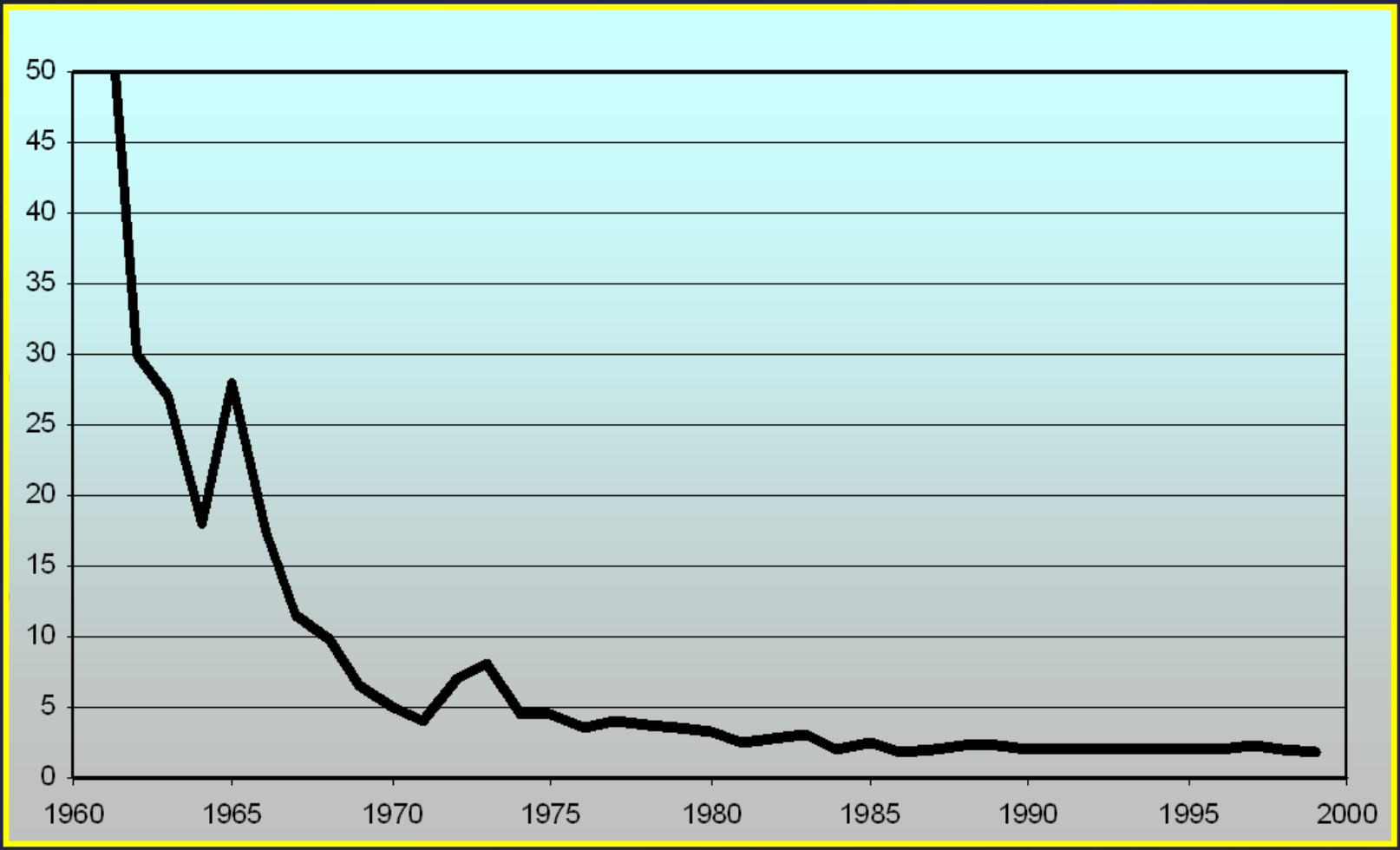


Aircraft safety - Errors

- Aircraft flight errors have decreased 400% over last 2 decades



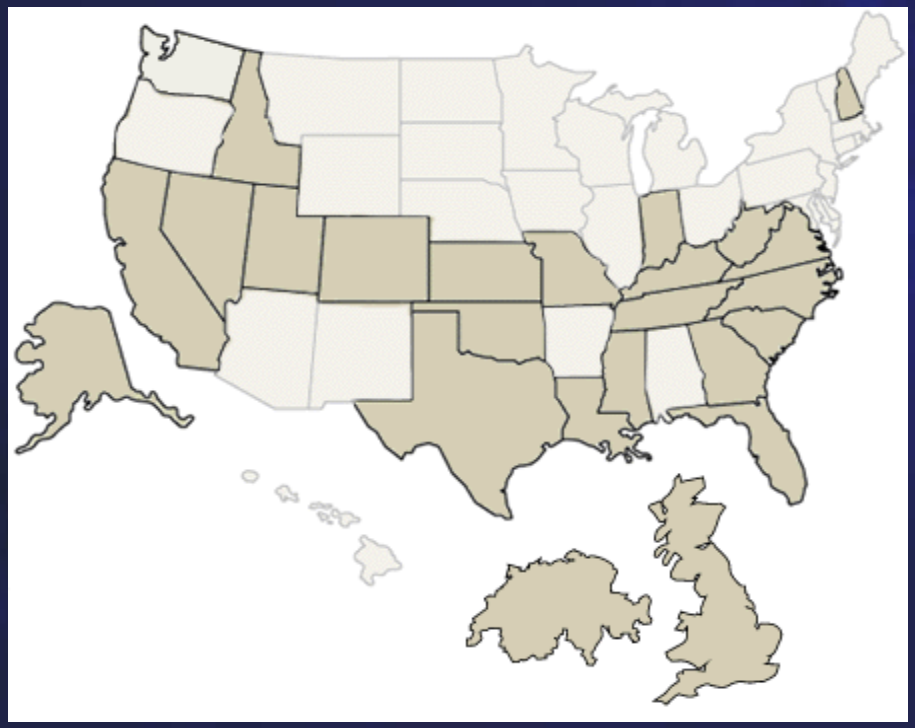
Commercial Aviation Worldwide Accident Rate (Boeing, 2000)



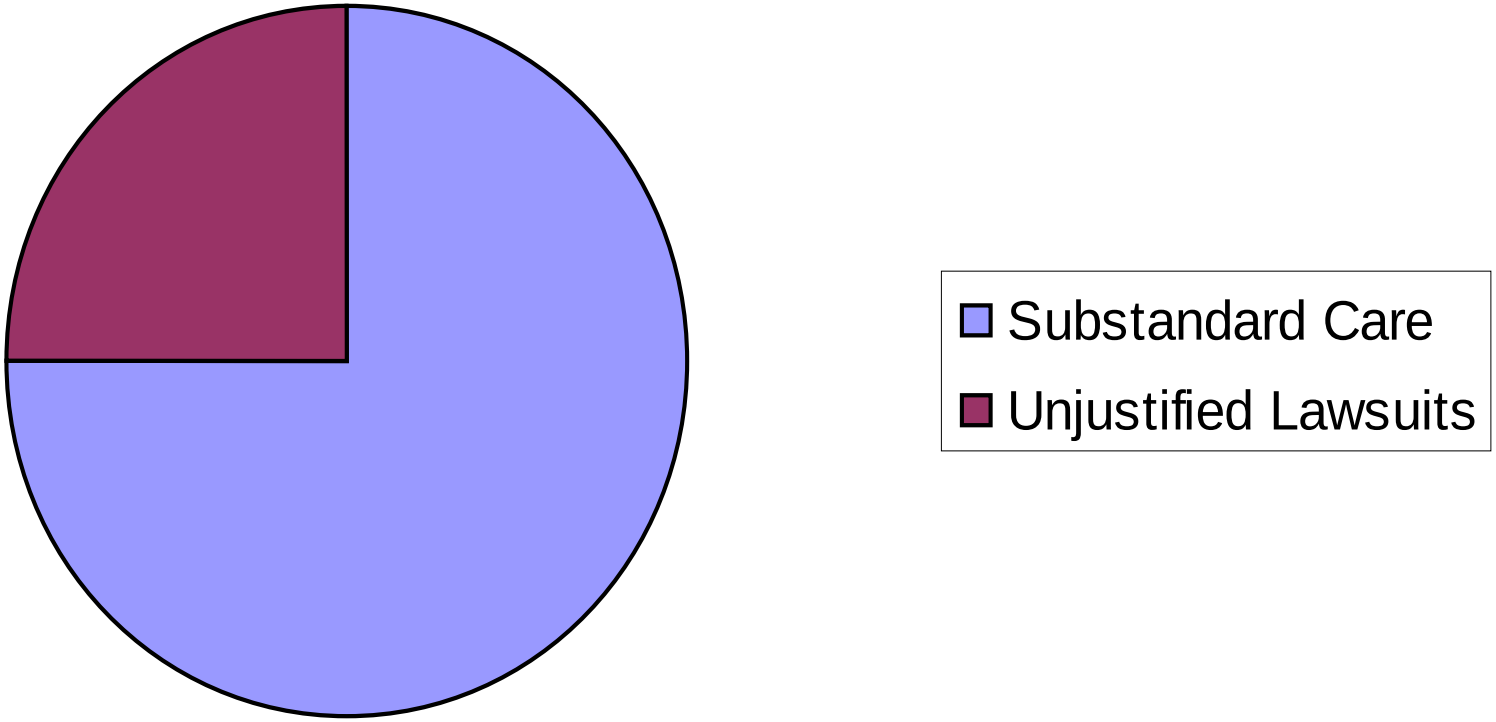
IN 2002 AND 2004 THERE WERE NO DEATHS DUE TO COMMERCIAL AVIATION ACCIDENTS ON THE PLANET EARTH

Can we say the same for preventable cerebral palsy or Erb’s palsy?

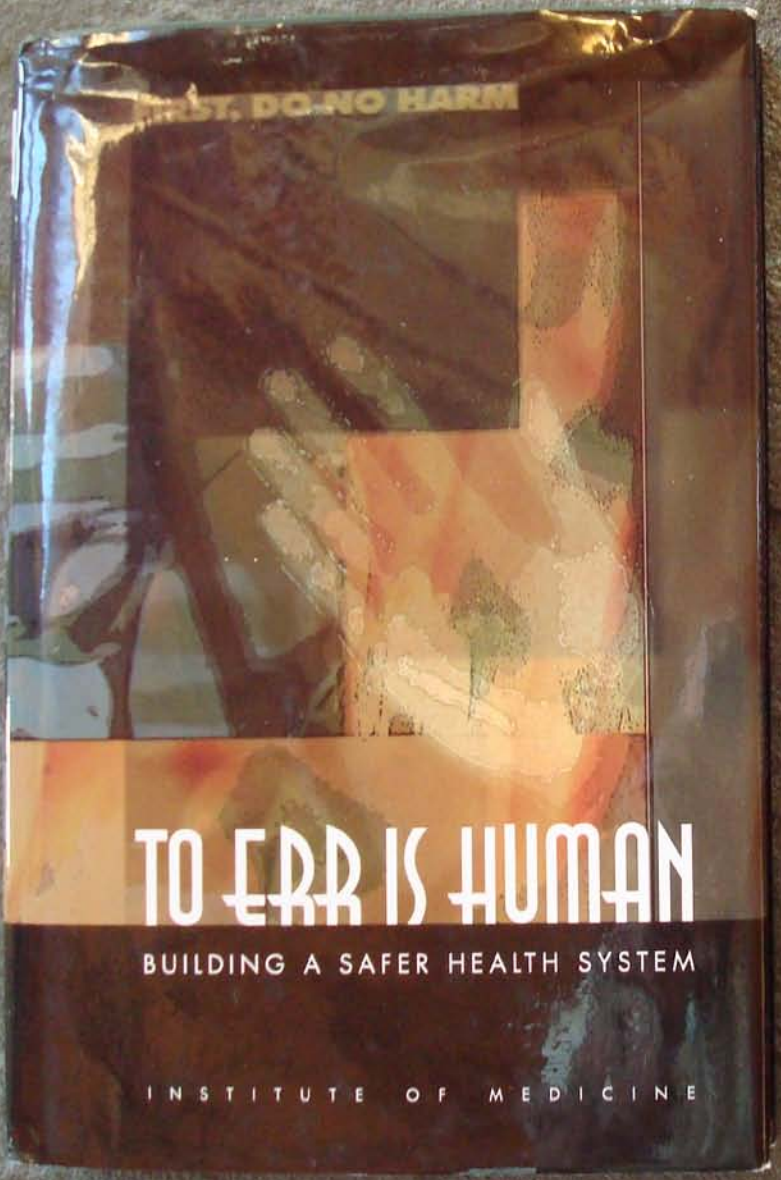
Obstetric malpractice – crisis or potential crisis states

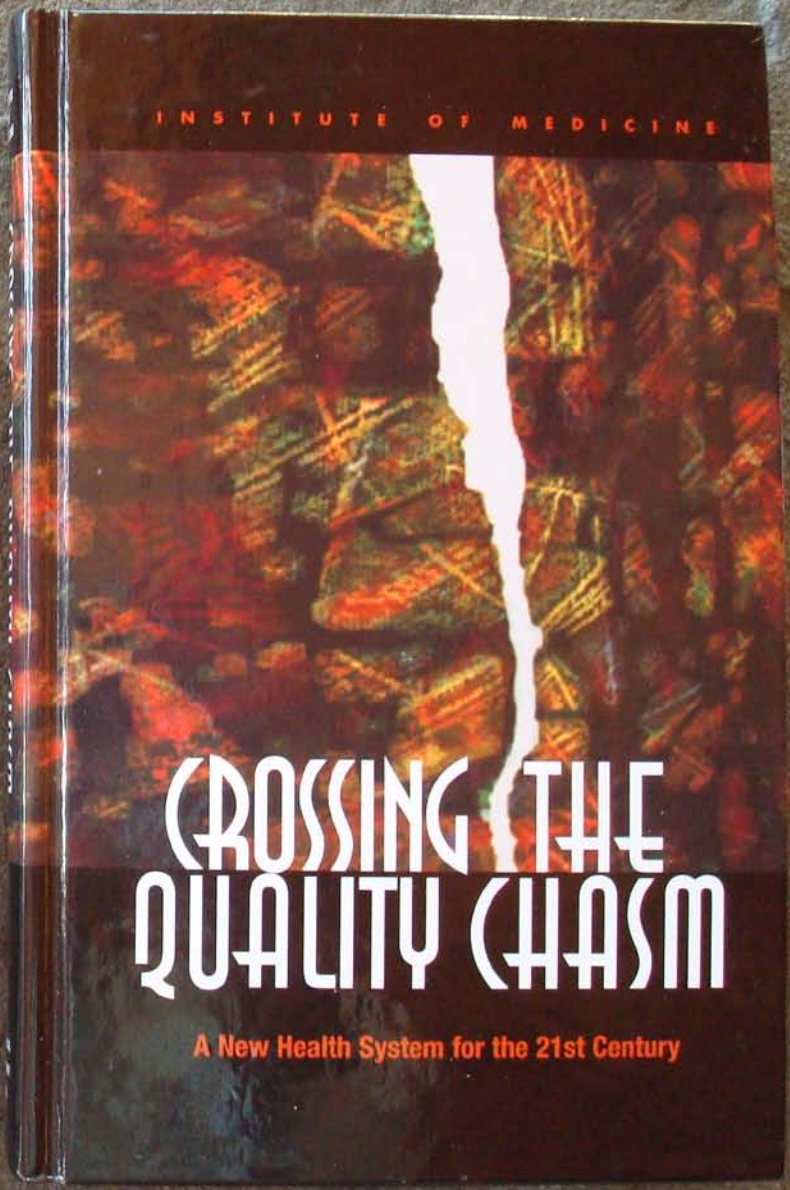


OB Malpractice Payments



So what do High Reliability Organizations know that we don’t?


FIRST, DO NO HARM
TO ERR IS HUMAN
BUILDING A SAFER HEALTH SYSTEM
INSTITUTE OF MEDICINE


INSTITUTE OF MEDICINE
CROSSING THE QUALITY CHASM
A New Health System for the 21st Century

THE HCA APPROACH
Based upon 5 principles

- Uniform process = improved outcome/ Process variation = poor outcome.
- Every member of the team is empowered and obligated to stop dangerous care
- Cesarean delivery is a process, not an outcome endpoint
- Litigation is best reduced by reducing adverse outcomes and improving documentation, not by attempting to make bad care more defensible
- Effective peer review is vital, but essentially non-existent in the United States

OBSTETRICS

Improved outcomes, fewer cesarean deliveries, and reduced litigation: results of a new paradigm in patient safety

Steven L. Clark, MD; Michael A. Belfort, MD, PhD; Spencer L. Byrum, LCDR (ret.) USCG; Janet A. Meyers, RN; Jonathan B. Perlin, MD, PhD

In a health care delivery system with an annual delivery rate of approximately 220,000, a comprehensive redesign of patient safety process was undertaken based on the following principles: (1) uniform processes and procedure result in an improved quality; (2) every member of the obstetric team should be required to halt any process that is deemed to be dangerous; (3) cesarean delivery is best viewed as a process alternative, not an outcome or quality endpoint; (4) malpractice loss is best avoided by reduction in adverse outcomes and the development of unambiguous practice guidelines; and (5) effective peer review is essential to quality medical practice yet may be impossible to achieve at a local level in some departments. Since the inception of this program, we have seen improvements in patient outcomes, a dramatic decline in litigation claims, and a reduction in the primary cesarean delivery rate.

Key words: litigation, patient outcomes, patient safety, quality medical practice

Cite this article as: Clark SL, Belfort MA, Byrum SL, et al. Improved outcomes, fewer cesarean deliveries, and reduced litigation: results of a new paradigm in patient safety. Am J Obstet Gynecol 2008;XXX:XXX.

The Hospital Corporation of America (HCA) is the nation's largest private health care delivery system, providing approximately 220,000 deliveries annually in 120 facilities in 21 states. Representing approximately 5% of all births in the United States, we describe here our assessment and approaches to 4 major challenges in contemporary obstetric practice and the initial results of these initiatives. Notably, and as part of a concerted effort to incorporate the features of high-reliability organizations into HCA's obstetrical services, these interventions have been associated with improved perinatal outcomes, a reduced primary cesarean delivery rate, and lower maternal and fetal injury, with reduced litigation, as measured by halving

cept such differences as the sole ex-

trend have not been readily forth-

NOTHING IS EVER ANYONE ELSE'S FAULT

“”Pilot error in the 90s – still alive and kicking”

Keynote address, Flight Safety Foundation, 1999

“OBSTETRICIAN ERROR IN THE NEW MILENNIUM- STILL ALIVE AND KICKING”

KEYNOTE ADDRESS

ACOG ANNUAL MEETING


Hell

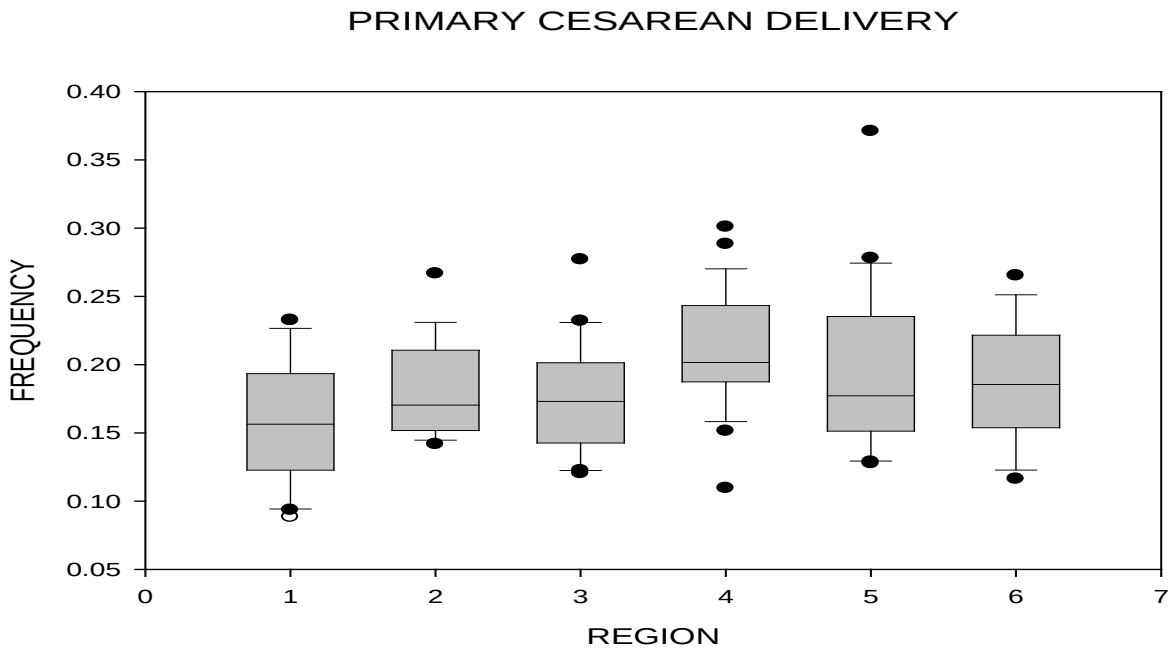
UNIFORM PROCESS = IMPROVED PRODUCT

- AUTOMOBILE MANUFACTURING
- COMMERCIAL AVIATION
- NUCLEAR POWER GENERATION
- ORGANIC EVOLUTION
- BASEBALL

- THIS PRINCIPLE APPLIES TO MEDICINE AS WELL

A VIRTUAL MEDICAL FREE-FOR ALL

Physician autonomy is promoted as
the essential positive, desirable good


PRIMARY CESAREAN DELIVERY
FREQUENCY
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0
1
2
3
4
5
6
7
REGION

“The aircraft checklist has long been regarded as the foundation of pilot standardization and cockpit safety”

Degani 2002

Northwest Airlines MD-80 checklist

NORTHWEST

MD–80

EXTERNAL ELECTRIC & PNEUMATIC SOURCE - START

PNEUMATIC X-FEEDS ..... BOTH CLOSED
PNEUMATIC AIR SOURCE ..... CONNECTED & ON
PNEUMATIC X-FEEDS ..... OPEN
PNEUMATIC PRESSURE (25 PSI MIN) ..... CKD
COMPLETE - BEFORE START CHECKLIST

AFTER ENGINES STABILIZED
PNEUMATIC X-FEEDS ..... BOTH CLOSED
ELECTRIC POWER ..... *CKD
EXTERNAL ELECTRIC & PNEUMATIC ... DISCONNECTED
COMPLETE - AFTER START CHECKLIST

BEFORE START

BRAKES ..... SET
WINDSHIELD HEAT ..... *ON
FUEL PUMPS ..... *(AS REQ)
CABIN PRESSURE CONTROLLER ..... *SET
AUX HYDRAULIC PUMP & PRESSURE ..... *ON & CKD
CIRCUIT BREAKERS ..... **CKD
AUTOLAND ..... CKD
TAKEOFF WARNING ..... CKD
RADIOS, ALTIMETERS & FLIGHT DIR .... **CKD & SET
FUEL & OIL ..... **(QUANTITIES) & RESET

IGNITION ..... ON
SEAT BELT SIGN ..... ON
BEACON ..... ON

AFTER START

ANNUNCIATOR ..... CKD
IGNITION ..... *OFF
ELECTRIC POWER ..... *CKD
APU AIR ..... *(AS REQ)
AIR CONDITIONING SUPPLY SWITCHES ..... *AUTO
PNEUMATIC X-FEED ..... *ONE CLOSED
TRANSFER PUMP & HYDRAULIC SYSTEMS .... *ON & CKD

TAXI

FLAPS ..... **(SETTING)
TRIM ..... **(SETTING)
EPR & AIRSPEED BUGS ..... **(SETTINGS)
ARTS ..... (AS REQ)
FLIGHT INSTRUMENTS ..... **(HDG) & SLAVING
CONTROLS & ELEVATOR POWER ..... *CKD-TOP
CKD-BOTTOM

DELAYED ENGINE START

BRAKES & IGNITION ..... (AS REQ) & ON

DELAYED AFTER START
ANNUNCIATOR ..... CKD
IGNITION ..... *OFF
ELECTRIC POWER ..... *CKD
APU AIR ..... *OFF
AIR CONDITIONING SUPPLY SWITCHES ... *AUTO

ENGINE ANTI-ICE & FUEL HEAT ..... (AS REQ)
PNEUMATIC X-FEEDS ..... *CLOSED
APU ..... *(AS REQ)

BEFORE TAKEOFF

FLIGHT ATTENDANT ..... *NOTIFIED
TRANSPONDER/TCAS ..... *(AS REQ)
ANNUNCIATOR ..... CKD
IGNITION ..... ON

CLIMB

NO SMOKE SIGN ..... *(AS REQ)
IGNITION ..... *(AS REQ)
FUEL PUMPS ..... *(AS REQ)
CABIN PRESSURE CONTROLLER ..... *CKD
SYNC ..... *ON
HYDRAULIC PUMPS ..... *OFF & LOW
FLAP TAKEOFF SELECTOR ..... *STOWED

IN-RANGE

ALTIMETERS ..... **(SETTING) & X-CKD
EPR ..... *(GA)
AIRSPEED BUG ..... **(SETTING)
SEAT BELT SIGN ..... *ON
CABIN PRESSURE CONTROLLER ..... *CKD
HYDRAULIC PUMPS ..... *ON & HIGH

Figure 2. From NTSB, 1988a, Appendix E, p.138

WHY IS THE CHECKLIST SO IMPORTANT?

- AIRLINE INDUSTRY: The team has never flown together before and will be engaged in difficult maneuvers requiring close coordination. Every team member must know what the others are doing, and are going to do.
- OBSTETRICS: Changing personnel, changing shifts, different experience, Captain not always present. Potentially lethal drugs/procedures.

“FAA officials should be sensitive to traditional and philosophical factors and their effects on checklists. There should be no compromise, however regarding the critical “killer” items.”

Degani and Weiner 1993

Aviation – Killer Items

- Aircraft takeoff
- Aircraft landing
- Crowded airspace
- Crosswinds during landing
- Downdrafts at low altitude

Obstetrics – Killer items

- Abnormal fetal heart rate tracing
- Oxytocin
- Misoprostol
- MgSO4
- VBAC
- Forceps/Vacuum
- Shoulder dystocia
- Prolonged second stage labor

“In airline literature regarding protocol development, the elimination of ambiguity is consistently cited as a key factor in protocol success and safety”

In contrast, most obstetric guidelines from official organizations are based upon ambiguity as a guiding principle of protocol development

Oxytocin Guidelines (AGOG 2004 Compendium)

- “Any of the low or high dose oxytocin regimens outlined in table 2 are appropriate” (0.5 – 6 mU/min q 15-40 min)
- “Each hospital’s OBGYN department should develop guidelines for preparation and administration of oxytocin”
- “The uterine contractions and fetal heart rate should be monitored closely”

Guidelines for landing a 747 in a strong cross wind:

- Use any settings of the plane's instruments you feel like
- Every airline and pilot can do it differently
- Be pretty darn careful

BUT IT IS NOT EVIDENCE BASED!

Evidence based medicine does not mean:

Unless you can prove it with multiple prospective randomized double blind placebo controlled cross-over trials, it's OK to do anything we feel like

Evidence based medicine does mean:

Where there is clear evidence of superiority of one method over another, use it.

There may be many appropriate ways to treat a condition

When using a team approach(with changing teams) – let’s pick one and get real good at it

Examples: GBS and Steroids for lung maturation

OXYTOCIN CHECKLIST (q 30 minutes)

- 1 acceleration (15 x 15) is present,

  OR

  adequate variability for at least 10 of past 30 minutes
- No more than 1 late deceleration
- No more than 2 variables exceeding 60 bpm depth from baseline for > 60 seconds

OXYTOCIN CHECKLIST (q 30 minutes)

- No more than 5 UCs/10 min for any 2 consecutive 10 minute intervals
- No 2 UCs lasting > 2 minutes
- Uterus palpates soft in between contractions
- If IUPC in place, < 300 MVU, and baseline tone < 25 mmHg

Self imposed traps

- VBAC – “Immediately available”
- DVT Prophylaxis

“I’M A BOARD CERTIFIED OBSTETRICIAN, AND NO ONE IS GOING TO TELL ME HOW TO MANAGE MY PATIENTS”

Neonatal and Maternal Outcomes Associated with Elective Term Delivery

Clark et al

Am J Obstet Gynecol (in press – available electronically 12/29/08)

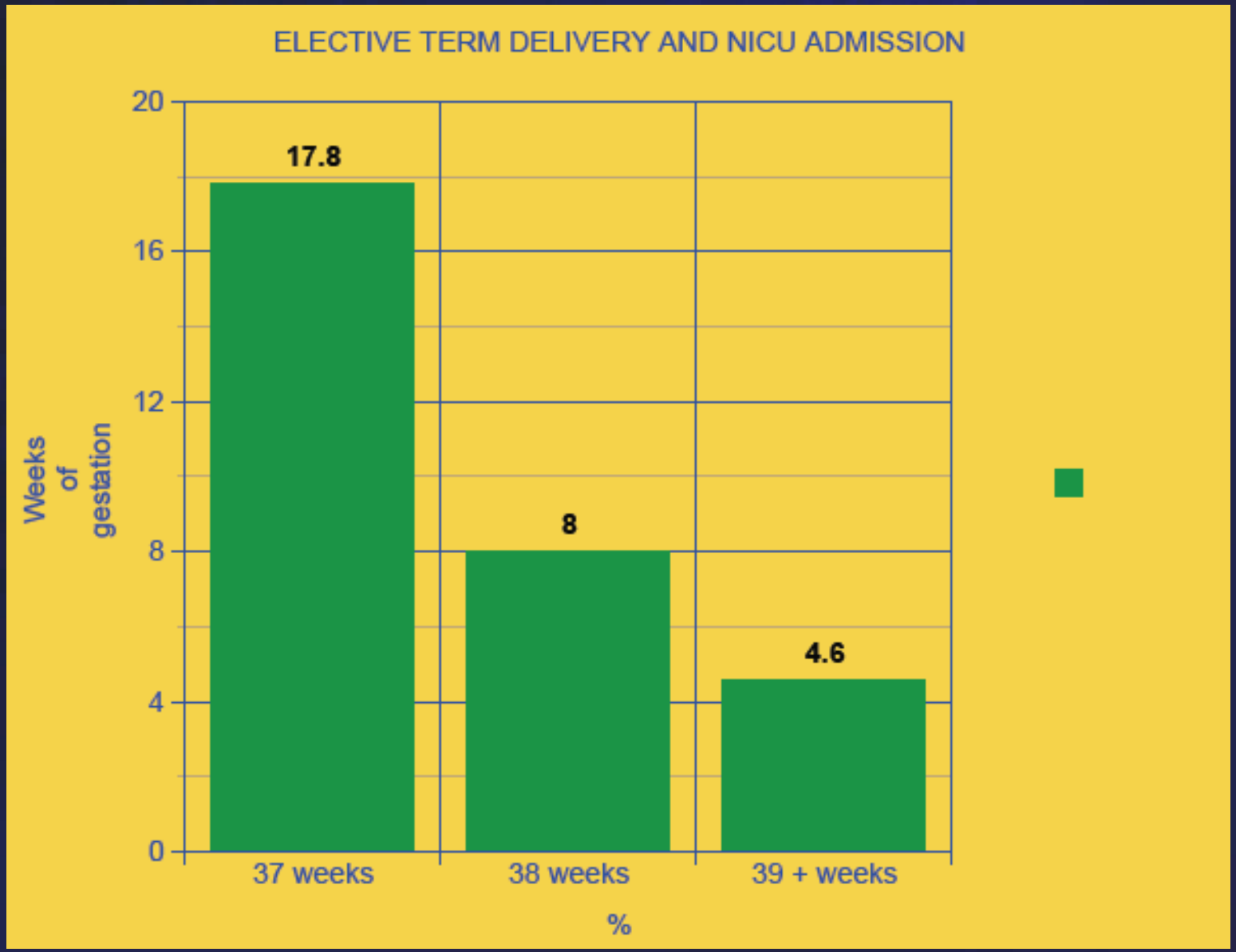
ELECTIVE TERM DELIVERY

- 17,000 + deliveries
- All deliveries in 2007
- 27 hospitals throughout the United States
- Representative – geographic and demographic balance

- This system (HCA) has previously been shown to be representative of the U.S. as a whole

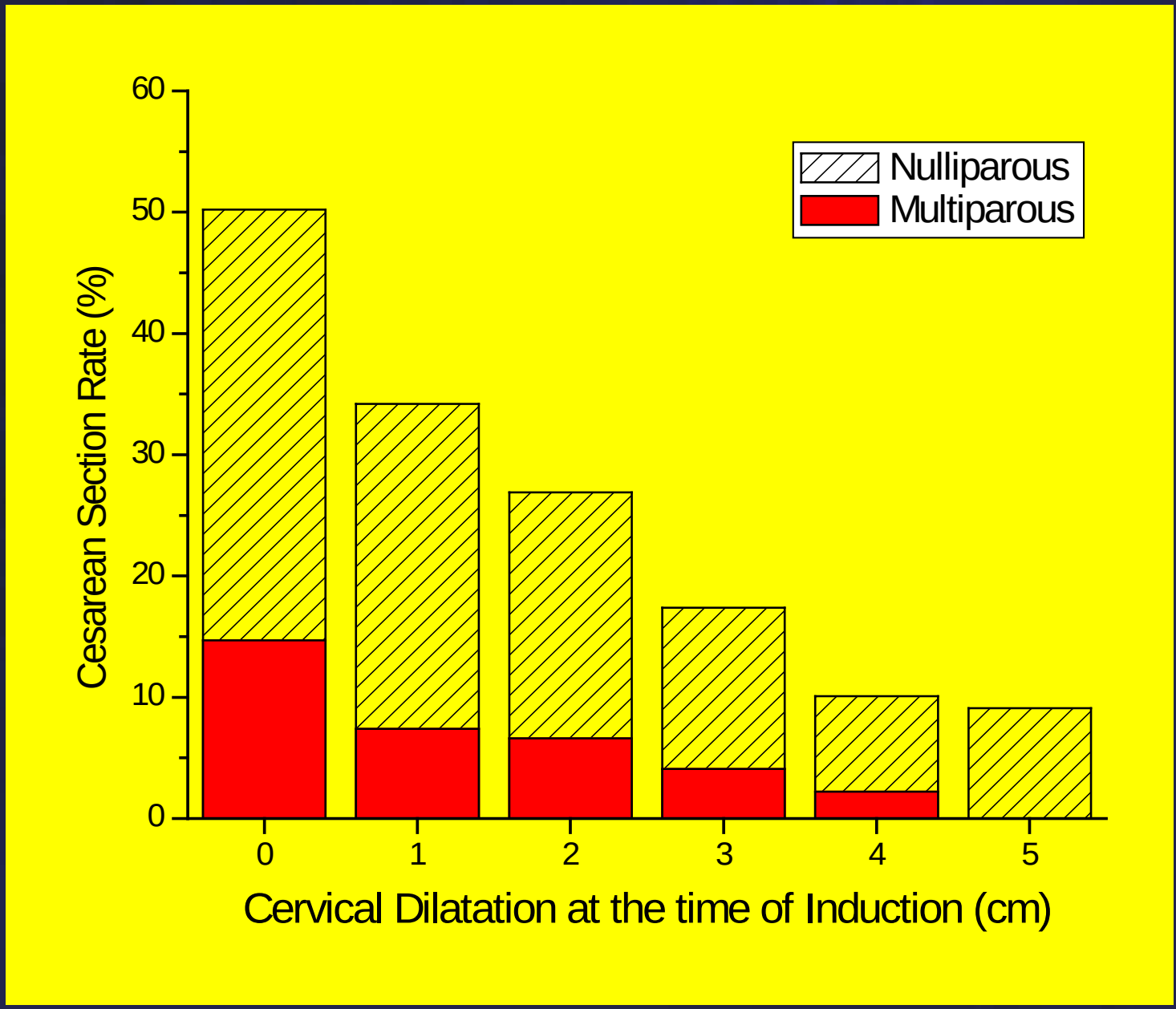
KEY RESULTS

- 31% of all term deliveries are performed electively
- This is an underestimation
- 10-15% of all deliveries performed electively and before 39 weeks


ELECTIVE TERM DELIVERY AND NICU ADMISSION
20
16
12
8
4
0
Weeks of gestation
17.8
8
4.6
37 weeks
38 weeks
39 + weeks
%

ELECTIVE DELIVERY PRE-39 WEEKS

- 30% initially admitted to normal nursery
- Mean NICU stay for those admitted: 4.5 d
- For elective inductions: 14.5 h labor (vs 10.5 – nulliparous) and 8.5 h labor (vs 6.5 parous)


Nulliparous
Multiparous
Cesarean Section Rate (%)
60
50
40
30
20
10
0
0
1
2
3
4
5
Cervical Dilatation at the time of Induction (cm)

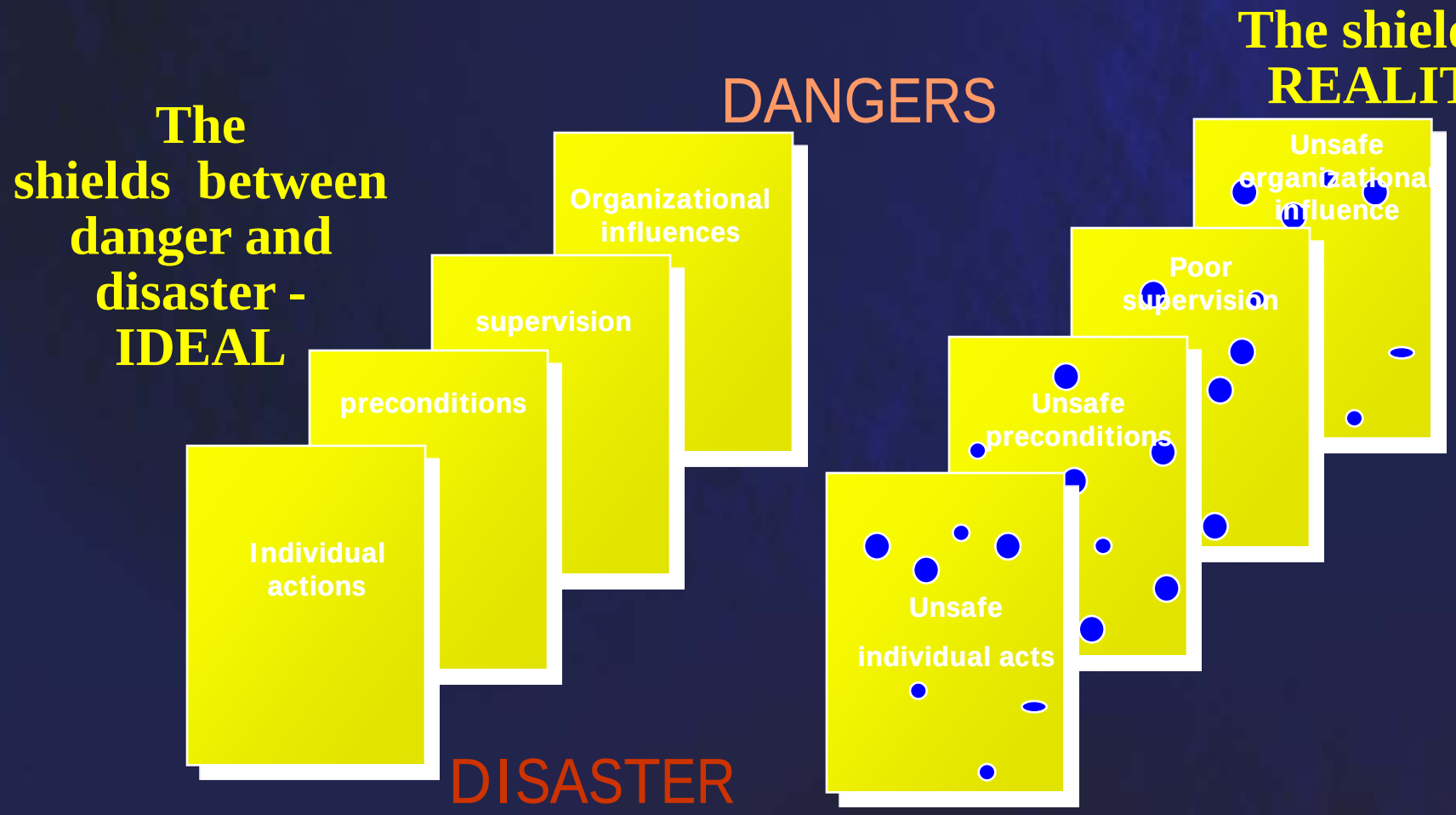
ACOG PRACTICE BULLETIN – Sept 2008: FETAL LUNG MATURITY

Reiterates standard initially set 20 + years ago by ACOG/AAP

Getting on the pre-39 week bandwagon/juggernaut

- ACOG
- March of Dimes
- Major Insurers (BC/BS, United)
- NQF
- Leapfrog etc.

Reason's "Swiss Cheese Model"



The system breaks down when the holes line up

THE RISING CESAREAN RATE

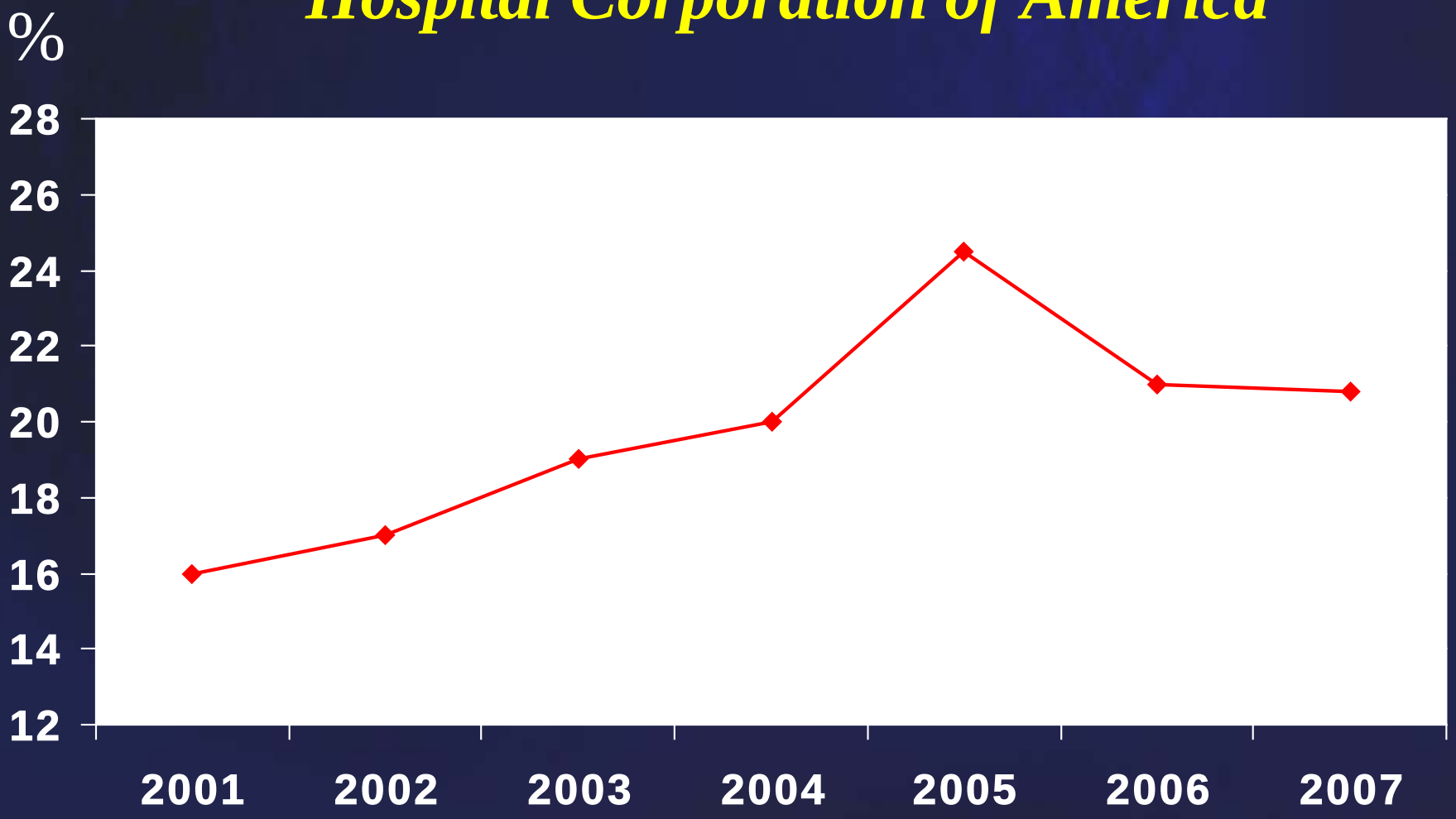
WHAT DO WE DO ABOUT IT?

WE IGNORE IT

The ideal rate will be achieved only when we achieve ideal practice – so let's focus on the latter.

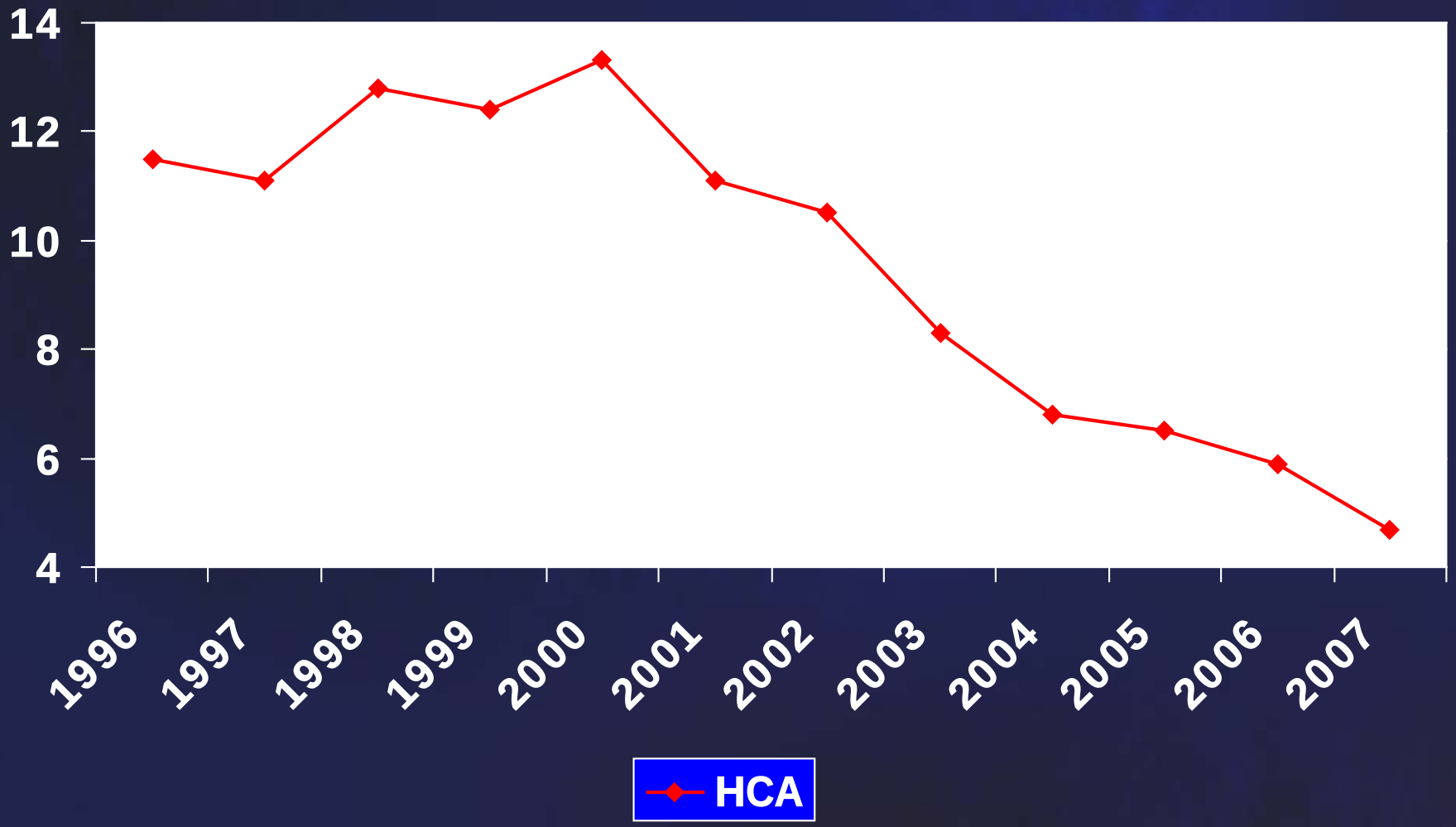
Lack of clear guidelines leads to a cesarean policy in the U.S. that is virtually random
(Clark et al, Am J Obstet Gynecol 2007;196:526)

PRIMARY CESAREAN DELIVERY RATE
Hospital Corporation of America



HAS THIS APPROACH PAID OFF?

Frequency Trends
Reported Claims Per 10,000 Births
Accident Year



OB LITIGATION CURRENTLY RANKS BEHIND “ACCIDENTS ON HOSPITAL GROUNDS” IN TERMS OF ECONOMIC COST TO HCA