Reducing Medical Errors

Team Training
(Crew Resource Management)
System Failures & Human Factors

- Excessive number of handoffs
- Long work hours
- Excessive workload
- Variable information availability
- Conflict resolution policy
- No mutual support
The Perfect Storm in Obstetrics

Physicians: cost of malpractice insurance
- Availability of insurance
- Limited liability coverage

Hospital:
- Cost of liability insurance
- Declining margins in Ob (revenue – expenses)
- Rising cesarean delivery rate – shortage beds

Access & Quality
Causes of Errors

- Habit
- Interruptions
- Hurry
- Fatigue
- Anger
- Anxiety
- Boredom
- Fear

Dr Lucian Leape
“MAN, A CREATION MADE
AT THE END OF THE WEEK
WHEN GOD WAS TIRED”

Mark Twain
THE “OOPS’ CENTER

The largest aircraft accident in history - 2 Boeing 747s collided

582 Deaths
The U.S.S. Vincennes

Navy Missile Downs Iranian Jetliner

Monday, July 4, 1988
A U.S. warship in the Persian Gulf mistook an Iranian civilian jetliner for an attacking Iranian F14 fighter plane and blew it out of the hazy sky. 290 persons were aboard.
Crew Resource Management
ERROR AVOIDANCE STRATEGY

“...error management capability to detect, avoid, trap, or mitigate the effects of human error and therefore prevent fatal accidents”.
Suzanne Powers
Baby Luke DOB Thanksgiving 2000

- G1P0
- Ruptured uterus – hysterectomy
- Stillbirth
- 18 days ICU, 3 weeks in hospital
- Settlement with family April 2001
- Annual Luke Powers memorial lectureship
Changes

- Redesigned QA & QI programs
- Team training (2002)
Team Structure and Relationships

Contingency Team

Coordinating Team

Core Team #1

Core Team #2
TEAMWORK MODEL

**Teams:**

1. core care teams – primary responsibility patient care
2. Contingency team - respond to specific conditions
3. coordinating team – the healthcare corollary to flight tower control

DEBRIEFING
Crew Resource Management

Medical Errors Reduction Research

Col. Peter Nielsen MD
Advisor to US Army Surgeon General
Madigan Army Medical center

US Department of Defense
Harvard Risk Management Foundation
### Adverse Outcomes Index

<table>
<thead>
<tr>
<th>Index Measures</th>
<th>Weighted Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal death</td>
<td>750</td>
</tr>
<tr>
<td>Intrapartum &amp; neonatal death &gt;2500g</td>
<td>400</td>
</tr>
<tr>
<td>Uterine rupture</td>
<td>100</td>
</tr>
<tr>
<td>Maternal admission to ICU</td>
<td>65</td>
</tr>
<tr>
<td>Birth trauma</td>
<td>60</td>
</tr>
<tr>
<td>Return to OR / labor &amp; delivery</td>
<td>40</td>
</tr>
<tr>
<td>Admission to NICU &gt;2500g &amp; for &gt;24hours</td>
<td>35</td>
</tr>
<tr>
<td>APGAR &lt;7 at 5 minutes</td>
<td>25</td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>20</td>
</tr>
<tr>
<td>3º or 4º perineal tear</td>
<td>5</td>
</tr>
</tbody>
</table>

**AOI = % patients with one or more adverse outcomes**
- 5,000 deliveries per year
- Staff: full-time & private practice
- ~ 20% patients Medicaid insurance
- NICU ADC 43 babies
Adverse Outcomes Index: BIDMC 2000 – 2005
Total, <37 weeks, >37 weeks Gestation

-26% >37wks
-25% Total
-53% <37wks

1=sentinel event; 2= QA/QI; 3= Team training
## BIDMC: Indemnity Experience

<table>
<thead>
<tr>
<th>36 months Pre- &amp; Post-Team Training</th>
<th>Claims + suits + observations</th>
<th>No. High Severity (%)</th>
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<td>8/1/1999 - 7/31/2002 ~15,000 deliveries</td>
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<td>11 (55%)</td>
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## BIDMC: Indemnity Experience

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<td>2</td>
<td>1</td>
</tr>
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</table>
20 Hospitals
85,000 deliveries per Year
1999 - 2004

Birth-death linked data
Adverse Outcomes Index
National Perinatal Information center
20 Hospitals (85,000 deliveries/year): Average & Range
AOI: High Risk Pregnancies < 37 weeks
NPIC: Average & Range
Severity Index (SI): 20 Hospitals (AOI / per patient with adverse event)
Average & Range
Patient Safety Programs

- Quality Assurance Committee
  - Real time data
- Quality Improvement Committee
- Clinical guidelines
- Team training
Team Training
Possible Applications & Implications

- Obstetrics
- Operating rooms
- Emergency rooms
- Intensive care units
- Tort reform & reduction in liability insurance costs
- Addition to medical/nursing school and residency curriculums
A Prospective Study of Patient Safety in the Operating Room
Surgery

*Surgery. 2006 Feb;139(2):159-73*
Meghan Dierks MD …Michael Zinner MD et al
Risk Management Foundation

Observational study - surgical cases at Brigham & Women’s Hospital-2002:
6 surgeons; 5 GI & 5 hepatobiliary cases
Methods

- Multidisciplinary observational team
  - 1 human factors expert + 1 surgeon
- Observation of patient-centered events:
  - pre-op phase → OR → post-op recovery
- Documentation of minute to minute events:
Workload - Competing Tasks

Clustering at technically demanding, high risk phases of case
Results
Near Misses – Adverse Events

- 10 cases:
  - 5 Adverse Events
  - 6 Near-Misses

- Compensatory actions of team members limited impact of these events

- Outside of observational study protocol, only 1 event would have been identified
Teamwork Encompasses CRM

DoD has led the way on team research and innovations

Non-Health Care
- Combat Information Centers
- Joint Forces Operations
- Army Platoons
- Army Special Forces
- Tank Crews
- Submarine crews

Health Care
- ED, OR, L&D, ICU
- Whole Hospital
- Combat Casualty Care

Team Training

CRM

20 YEAR HISTORY
Summary

- Patient disclosure – power of saying I am sorry
- CRM; commercial aviation & military
- Adverse Outcomes Index
- BIDMC experience (38 months):
  - AOI ↓
  - patient & staff satisfaction ↑
  - Claims, suites & observation cases ↓
QSHC Supplement

Conceived by:
Paul Barach
Jim Battles

Edited by:
Kerm Henrickson and Fiona Moss

Quality & Safety in Health Care

Simulation and team training

Publication of this supplement has been made possible by support from the Agency for Healthcare Research and Quality and the Department of Defense in the USA.

www.qshc.com
Disclosure

I work with Harvard’s Risk Management Foundation to provide QA & team training educational programs