



## Information Systems, Quality Gaps & Digital Observation

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## Consent for Care

WARNING, our physicians and nurses are attempting to use antiquated manual record-keeping systems and their own limited memories in an often futile attempt to deliver a complex set of services without error. The logic of these human beings has been tested incompletely at some point in the past, but we offer no warranty expressed or implied that any individual decision made or action taken will be provably correct. Moreover, we do not know the effect of aging, distractions, overwork, and failure to communicate on the overall care you will receive. Because we do not take a systems approach to health care services, by signing this consent you agree to participate in this admittedly error-prone and potentially life-threatening activity.

*Sign here*

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## Limitations Information Systems

- Ultimately about communication
- Collect data at a cost and with bias
- Interaction with clinicians disruptive
- Limited understanding of workflow and team interactions
- Expense and take time to implement
- Quality and Safety are after thoughts

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## Even arguably good interventions are fundamentally disruptive

Physicians have more to do and less time to do it.

Consider electronic prescriptions?



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### Total Prescriptions\* (U.S. Millions)

Chain Stores	1,811.0
Independent	779.7
Food Stores	469.6
Long-Term Care	245.2
Mail Service	213.9
<b>Total U.S. Market</b>	<b>3,519.4</b>



\*Source: IMS Health, National Prescription AuditTMPlus, 1/2005

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## What is the cost of 1 additional second needed for eRx?

- 3,519,400,000 seconds
- 58,656,667 minutes
- 977,611 hours
- 40,734 days
- 470 full time physicians for 1 year
- \$78,208, 888



Mix a tablespoonful with a tablespoonful of water three times a day after meals

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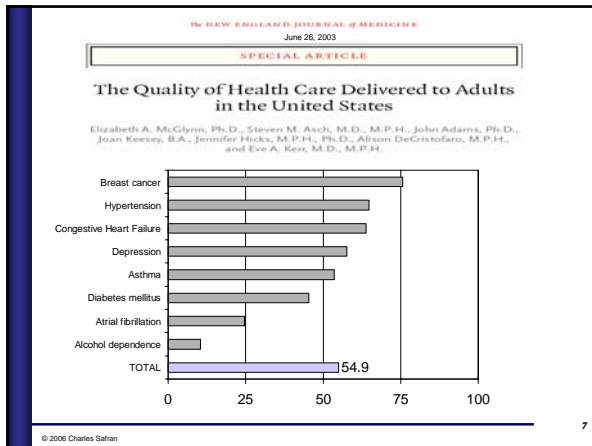
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- ### Contributors to Quality-Safety Deficits
- Knowledge deficits
  - Systems or design constraints
  - Judgment errors
- } 'Class I'
- Failure to attend
  - Risk 'tolerant' behaviors
  - Workarounds and shortcuts
- } 'Class II'
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- ### Quality and Patient Safety
- Class I: better suited to IT interventions that can provide a 'safety net' and enable feedback in the form of reliable data
  - Class II: less well suited to conventional IT interventions; limited and unreliable data for tracking and continuous improvement
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## Quality and Patient Safety

- Nosocomial infections represent one of the major adverse outcomes that result from
  - ♦ Failure to attend
  - ♦ Risk 'tolerant' behaviors
  - ♦ Workarounds and shortcuts
- We do not have reliable data to understand *where in the process of care* quality and safety fail

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## More IT may not be the answer!

- Human intervention is sometimes necessary and frequently preferable
- Direct observation of clinical operations and processes of care can help us understand the source of these safety issues
- Objectively recorded observations provide data for comparisons and improvement

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## Limitations of Observation

- Requires significant human resource commitment
- Scalability issues – locations, times
- Perceptions of policing – positive feedback limited
- 'Control' is ceded to the observer
- "Nurse spy" places clinicians who should be part of team in adversary roles
- Erodes trust
- Impact is not durable – lapses recur when observer leaves

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## Central Line Infections

- **250,000** cases of central line--associated bloodstream infections in US hospitals (estimated)
- **12%--25%** attributable mortality for each infection (estimated)
- **\$34,508--\$56,000** attributable cost per infection (estimated)

Ref Kluger DM, Maki DG. The relative risk of intravascular device related bloodstream infections in adults [Abstract]. Abstracts of the 39<sup>th</sup> Interscience Conference on Antimicrobial Agents and Chemotherapy. San Francisco, CA: American Society for Microbiology, 1999:514

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## Ventilator-Acquired Pneumonia (VAP)

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## Ventilator-Acquired Pneumonia

- **5 to 14.7 per 1,000 ventilator days**
- **6-21 times the risk** for acquiring nosocomial pneumonia if ventilated
- **14%** attributable mortality for ventilated patients who develop pneumonia
- **\$40,000 - \$57,000** per occurrence additional cost to hospitalization (estimated)

Tablan OC, Anderson LJ, Besser R, et al. CDC Healthcare Infection Control Practices Advisory Committee. Guidelines for preventing health-care-associated pneumonia. 2003 recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee. MMWR Recomm Rep. 2004;53(9):1-36.

Ibrahim EH, Tracy L, Hill C, et al. The occurrence of ventilator-associated pneumonia in a community hospital: risk factors and clinical outcomes. Chest. 2001;20(2):555-561.

Cocoranou CS. Cost of a Ventilator-Associated Pneumonia in a Shock/Trauma Intensive Care Unit. Surgical Infections Mar 2005, Vol. 6, No. 1: 65-72

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## Well-Defined Behaviors that Increase Risk

- Catheter-Related Infections:
  - Inadequate hand-washing by staff
  - Inadequate barrier protection during insertion
  - Inadequate care of line post-insertion
  - Insufficient decontamination of skin prior to insertion
- Ventilator Acquired Pneumonia:
  - Inadequate hand-washing by staff handling circuits
  - Contamination of circuit by temperature probes
  - Insufficient decontamination of circuits, humidifier and temperature probes
  - Inadequate positioning of bed and GI decontamination procedures

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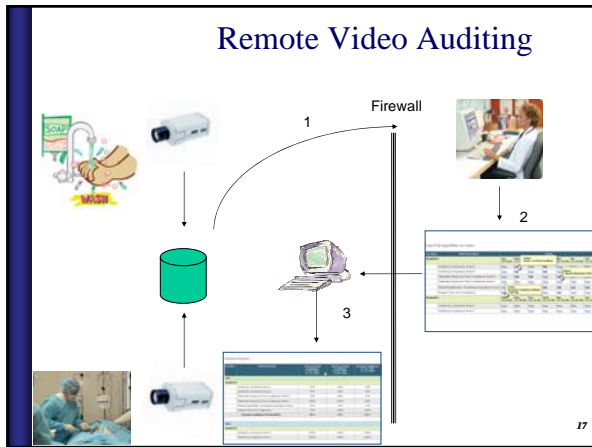
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## Remote Video Auditing




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## Catheter Insertion

The screenshot shows a video player displaying a catheter insertion procedure. The video is paused at 00:30 of 01:00. The video title is 'central\_line\_barrier\_rate1.a16'. A table of video files is visible in the background.

File Name	Video Size	Start and Time of Video
central_line_barrier_rate1.a16	4423 KB	2005 Nov 09 13:05:17.600
hand_hygiene_rate1.a16	529 KB	2005 Nov 09 13:43:18.100
ventilator_circuits_rate1.a16	888 KB	2005 Nov 09 09:10:18.200

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## A thoughtful approach to privacy

- **Proportionality**  
Is there an appropriate balance between the importance of the goal and the cost of the means?
- **Alternative means**  
Are other, less costly means available?
- **Consequences of inaction**  
Where the means are costly in terms of privacy, what are the consequences of taking no surveillance action?
- **Protection**  
Are adequate steps taken to minimize risk and cost?

- Ethics of Surveillance by Gray Marx (Information Society, 14:171-85, 1998.)

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## Hospital Video Auditing

- A new tool for quality and safety
- 3<sup>rd</sup> Party audits ease tension created by internal monitoring
- Supports performance improvement
- Protects patient and staff confidentiality

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For more information on  
Hospital Video Auditing

contact:

Arrowsight

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Dr. Charles Safran is a paid consultant with Arrowsight

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