HSJ

Patient Safety Congress

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First Do No Harm: Critical Elements for Minimising Care-Associated Injuries

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Disclosures

*I receive a monthly retainer as a part-time (3 days / month) senior advisor for **Health Catalyst**, and own (a small amount of) Health Catalyst stock.*

*I serve on the board of directors of **SaVia**, a start-up, privately-held software company that supports clinical workflow design.*

*I also serve on an advisory board for **Amplifire**, a privately-held company that provides computer-based health care education products.*

Neither I nor any family members have any other relevant financial relationships to be directly or indirectly discussed, referred to or illustrated within the presentation, with or without recognition.

Outline – 2 ideas

1. ***Better methods for injury event detection***

2. ***Industry-level 'standard' approaches for injury event prevention***

November 30, 1999:

The Institute of Medicine *(now the National Academy of Medicine)*

Committee on Quality of Health Care in America

announces its first report:

To Err is Human: Building a Safer Health System

Institute of Medicine Committee on Quality of Health Care in America. *To Err Is Human: Building a Safer Health System.* Kohn, Linda T., Corrigan, Janet M., and Donaldson, Molla, editors. Washington, DC: National Academy Press, 2000.

Care-associated injuries in hospitals

account for

44,000 - 98,000 preventable deaths per year

in the United States

More people die from hospital-based preventable medical injuries than from breast cancer or AIDS or motor vehicle accidents

A series of studies finding that

2 to 4% of hospitalized patients suffer care-associated injuries

Injuries drive direct health care costs totaling $9 to 15 billion per year

Thomas et al. 1999
Johnson et al. 1992

Institute of Medicine Committee on Quality of Health Care in America. *To Err Is Human: Building a Safer Health System.* Kohn, Linda T., Corrigan, Janet M., and Donaldson, Molla, editors. Washington, DC: National Academy Press, 2000.

3 methods for finding injuries

1. ***Voluntary reporting*** *("Sentinel Events", "Serious Safety Events")*

2. ***Retrospective chart review***
   - *Unstructured review (HMRS, Utah-Colorado)*
   - ***Structured review*** *("triggers"; IHI GTT, Bates' SafeCare)*
   - *Automated reuse of financial billing codes (PSI, Utah-Missouri)*

3. ***Prospective expert review***
   - *Supports prospective intervention (Evans, Bates)*
   - *Complements retrospective chart review*
     (both find events that the other method misses)

Institute of Medicine Committee on Data Standards for Patient Safety. *Patient Safety: Achieving a New Standard of Care.* Aspden, Philip, Corrigan, Janet M., Wolcott, Julie, and Erickson, Shari M., editors. Washington, DC: National Academy Press, 2001 (Nov 20).

IHI Global Trigger Tool

- LDS Hospital; random sample containing 325 patients, hospitalized during October 2004
- Record review performed March 21-22, 2005, by a team of 7 trained abstractors
- All charts, at all levels, reviewed twice

35.1% of all admissions had at least 1 care-associated event

26.0% had at least 1 event within index admission

(9.1% of all hospital admissions resulted from outpatient care-associated adverse events)

Rate	Severity Level
53%	E - temporary harm, required intervention
33%	F - temporary harm, initial or prolonged hospitalization
3%	G - permanent harm
7%	H - intervention required to sustain life
1%	I - patient death

Rate	Source
52%	medications
20%	procedure complications
13%	infections
8%	care issues
3%	device failures

Unusual findings: minimal issues relating to anticoagulants, insulin, and PCA pumps, which are much bigger at other institutions (LDSH has protocols in place for these). That yields an injury rate of 82 / 1000 patient days, while most other hospitals are just above 100 injuries per thousand patient days.

Extrapolating to a full year, about 132 'sentinel event' deaths occurred.

Classen DC, Resar R, Griffin F, Federico F, Frankel T, Kimmel N, Whittington JC, Frankel A, Seger A, James BC. 'Global Trigger Tool' shows that adverse events in hospitals may be ten times greater than previously measured. *Health Affairs* 2011; 30(4):581-9 (April).

Validated across multiple studies

IHI GTT *(2004 data)*	***795***	***26.0%***
DHHS OIGx2 *(2010,18 data)*	***@800***	***25.0%***
SafeCare* *(2018 data)*	***2,750***	***23.6%***

*Bates, David W., Levine, David M., Salmasian, Hojat, *et al*. The safety of inpatient health care. *N Engl J Med 2023; 388*(2):142-52 (Jan 12).

Voluntary reporting

By far the most common form of detection used across all care settings.

Also sometimes called:

- *nurse incidence reporting*
- *serious safety events (SSEs)*
- *Includes Sentinel events, JCAHO "never events"*

Compared to other methods, finds about

1 in 100 *actual care-associated injury events*

Done competently, with heavy emphasis:

1 in 10 *actual care-associated injury events*

Voluntary reporting

Does not generate a representative sample

Better detection methods lead to very different priorities / patterns / methods for effective prevention

You can't fix
what you can't find

Avoidable mortality – *a more accurate estimate*

Conservatively (lower bound),

about ***210,000 preventable deaths each year***

(upper bound ≈ 400,000 deaths/year)

just U.S. in hospitals

(doesn't include deaths arising from care in outpatient settings, which are probably more frequent than deaths in inpatient settings)

(U.S. COVID mortality over 3 years: ~370,000/year (1.1 million total deaths))

- ***Hospitals fall somewhere between the 2nd and 4th most common cause of preventable death in the United States****; leading to*
- *the idea of hospitals as a major public health problem*

James, John T. A new, evidence-base estimate of patient harms associated w hospital care. *J Patient Saf* 2013; 9(3):122-8 (Sep).

A complementary approach

1. ***Voluntary reporting*** *("Sentinel Events", "Serious Safety Events")*

2. ***Retrospective chart review***
   - *Unstructured review (HMPS, Utah-Colorado)*
   - *Structured review ("triggers"; IHI GTT, Bates study)*
   - *Automated: reuse financial code extraction (PSI, Utah-Missouri)*

3. ***Prospective expert review***
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Quality Science

High frequency injury sources

1. ***Adverse drug events*** *(ADEs, ADRs)*
2. ***Procedure complications***
3. ***Iatrogenic infections***
   - *post-operative deep wound infections*
   - *urinary tract infections (UTI)*
   - *lower respiratory infections (pneumonia or bronchitis)*
   - *bacteremias and septicemias*
4. ***Pressure injuries***
5. ***Mechanical device failures***
6. ***Complications of central and peripheral venous lines***
7. ***Deep venous thrombosis / pulmonary embolism*** *(DVT/PE)*
8. ***Strength, agility, and cognition*** *(fall injuries, use of restraints)*
9. ***Blood products***
10. ***Patient transitions*** *(handoff failures; mostly ADEs)*

Institute of Medicine Committee on Data Standards for Patient Safety. *Patient Safety: Achieving a New Standard of Care.* Aspden, Philip, Corrigan, Janet M., Wolcott, Julie, and Erickson, Shari M., editors. Washington, DC: National Academy Press, 2001 (Nov 20).

When the COVID-19 pandemic hit

20 years of
progress in patient safety
disappeared

Fleisher LA, Schreiber M, Cardo D, Srinivasan A. Health care safety during the pandemic and beyond – building a system that ensures resilience. *New Engl J Med* 2022; 386(6):609-11.

Our assessment of causes:

- *Reductions in staff, to optimize budgets (financial returns)*
- ***Non-standard care** – every care group had its own, complex approach to patient safety around specific, high priority sources of injury*
- *Primary reliance on clinicians' professional commitment*

James, BC, Savitz L, Fairbanks RJ, Bisognano M, and Pronovost P. Patient safety performance: Reversing recent declines through shared profession-wide system-level solutions. *NEJM Catalyst* epub December 12, 2022; DOI: 10.1056/CAT.22.0318

Our prescription:

- ***Deploy 'state of the art' detection***

  1) prospective expert review (automated clinical flow monitoring systems)
  2) automated clinical chart review methods
  3) traditional voluntary reporting

- ***Deploy standard approach for each major injury source across all care delivery locations***

allows aligned, standard training for all health professionals,

including real-time review and reinforcement

CommonSpirit *(selected ~40 of 150+ U.S. based, Catholic hospitals)*

- ***Detected injury rates: ~20% of inpatient admissions***
  - *4 recent, major studies -- ~25% injury rate, 'state of the art' detection*
  - *At least 10x higher rate than that found using voluntary reporting*
  - *Serious/sentinel events are detected at similarly higher rates*

- ***On average, an event roughly doubles hospital stay, plus increases other resource consumption***
  - *at CommonSpirit,* ***~$4,600 in additional baseline cost per case***
  - *<2% of such events result in rapid death, which avoids direct costs*

- ***Injury event rates fell by 20% to 60%***
  - ***far better quality of care, that drove significant cost savings***
  - *varied by hospital and by injury event type*

Quality Science

Better has no limit ...

an old Yiddish proverb