Guidelines: are they making us stupid?

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"Rules are for the guidance of wise men and the blind obedience of fools."

Are we reducing doctors to technicians, who simply process patients using guidelines devised by others?
Problems with guidelines

1. Underlying evidence often low quality

- Frequently heavily opinion-based
  - ? just move practice variation up one level

- Often overturned, reflecting poor original evidence
  - NASCIS
Problems with guidelines

2. Numerous guidelines for same condition

- Conflicting guidelines between groups of physicians, institutions, LHDs, states, countries
Problems with guidelines

3. Often drive and then measure process rather than outcome

- Process a surrogate of outcome - ? validity
- Rotter et al Cochrane Sep 2010, 27 studies
  - 5/27 reported complications, & 3/27 mortality
- Grimshaw 1993, review 59 evaluations of CG
  - 55/59 improved process, 9/11 improved outcome
- Lutgenberg et al 2009, review 20 evaluations of CG
  - 17/19 improved process, 6/9 improved outcome
Problems with guidelines

- Several studies looking at DKA management
  - Homogenous disease process
  - Chart review 241 patients 2000-2005
  - Compared before & after (their own) protocol in 2003
  - Shorter ICU LOS (44 v 34 hours!)
  - Faster clearance ketones and anion gap
Problems with guidelines

When the important thing is difficult to measure, something easy to measure will become important
Problems with guidelines

4. Often influenced by commercial vested interests
   - Conflicts of interest common, and frequently not disclosed
   - “Panel stacking”
   - Clinical guidelines V industry marketing tools
Problems with guidelines

5. Can be slow to incorporate new evidence

- 2001 JAMA study reviewed 17 “current” clinical guidelines advocated by US AHRQ
- 7 needed “major update”
- Only 3 up to date
Problems with guidelines

6. Expensive to develop & implement

- Grimshaw et al 2004 reviewed 235 studies looking at costs and efficiency of guidelines

- Only 25/235 reported costs!
Problems with guidelines

7. Clinicians don’t always follow guidelines
Problems with guidelines

- CAEP submission to 2002 Royal Commission on the Future of Health Care in Canada
  - Expensive to produce & implement
  - Quality & impact are poorly understood
  - Evaluation time consuming & difficult
  - Financial, process and time outcomes
  - Underlying evidence often poor
  - ? little change in 15 years
Guidelines – recent improvements

- Better evaluation of underlying evidence
- US Agency for Healthcare Research and Quality, National Guideline Clearinghouse
  - Currently 11,797 national guidelines
- NHMRC, Clinical Practice Guidelines Portal
  - > 2400 guidelines submitted for inclusion
  - 593 guidelines currently available
Problems with guidelines

- There are many!

- Excellent review in 2014 Emergency Medicine & Acute Care course
  - “Clinical Guidelines – Be Skeptical”
  - Pages 183-198 of manual
  - 38 references
Who do guidelines benefit?

- The patient?
- The clinician?
- Non-clinicians / administrators?
  - Risk management
  - Control costs
  - Increase productivity
  - Downplay “clinical judgement”
- The guideline writers?
- Growing industry!
WARNING

Hot coffee can cause severe burns. Not responsible for loose fitting lids. Coffee stains can be permanent. Two cup limit recommended. Do not drink hot coffee while driving. Decaffeinated coffee may contain slight amount of caffeine.

Danger! Waterfall

Watch your step near the water. The rocks are deceptively slippery. Stay out of the water upstream from the falls. If you lose your footing, powerful currents will carry you over the falls. There's no second chance.
Workers are advised that during the current wet weather and storm conditions extra ordinary care must be
taken to ensure the safety of both our staff, visitors, patients and others at our facility.

The following tips have been put together to aid in identifying potential hazards before they lead to incidents
and to ensure the proactive management of our risks:

1. When leaving a wet area ensure shoes are dried off to avoid slips and carrying water into the facility
2. Wear closed in shoes that are non-slip
3. Plan your path of travel to avoid wet areas where possible
4. Contain spills and clean up small amounts of water as identified (it’s everyone responsibility)
5. Notify Environmental Services of areas that have excessive water
6. Observe any potential roof leaks and place wet floors signs and/or bucket underneath.
   a. If near fire detectors or light fittings notify Fire Manager ASAP
   b. If leaks are over electrical equipment switch off at power point (if safe to do so i.e. no water
      on electrical outlets switches), move equipment if possible and notify Engineering via
      phone/pager and BEIMS
   c. Ensure any roof leaks over patient bed bays are escalated to Engineering ASAP and the
      patient is moved to a free bed bay. Contact the patient flow manager if needed.
7. When driving vehicles ensure you drive to the speed limit or below, ensure lights are on and do not
   use Cruise Control.
8. Avoid roads with water running across them
9. Keep warm using layers of clothing underneath uniforms
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Do guidelines make us stupid? Why look at aviation?

- Minimal evidence from healthcare
- BUT growing disturbing evidence from aviation
- Parallels between aviation and healthcare
  - Both facing similar challenges
  - Both adopted standardisation
  - Reasonable to consider if lessons for healthcare
Airline pilots
- Minimal manual flying
- Heavy use of automation
- Standardised procedures

“Children of the magenta line”

How did this come about?
Aviation – the problem

- Mechanical failures were progressively engineered out during early jet era

- Ongoing analysis of aircraft accidents demonstrated majority were due to pilot error
Aviation – the challenges

- Increased financial pressure
- Need for increased productivity & reduced costs
- Rapid global expansion of aviation
- Many new pilots
- Emergence of low cost carriers
Aviation – automation the solution

- Increased automation seen as the solution for all these problems
  - Reduce pilot input = reduce pilot error
  - Decreased costs
    - Employ lower paid less experienced pilots
    - Reduce training
  - Dramatic progressive improvement in safety
  - BUT....
Aviation – unintended consequences of automation

- Pilot “disconnected” from plane
- Decreased situational awareness
- Delay ‘catching up” when problem arises
- Complex systems and subsystems
  - Fail in complex, unanticipated, one-off ways
- Confusion and indecision in crisis
- Decreased manual flying skills
Aviation – unintended consequences of automation
How do airline pilots describe their job?

- Boring, tedious
- Repetitive, routine
- Become complacent, lazy
- Deskilled
- “Not really flying anymore”
- Loss of empowerment

How do our trainees describe their work?
Probably not just laziness
FAA - New type of accident

- “Automation dependency”
  - Over-reliance on automation
  - Too much of a good thing

- Loss of traditional basic pilot skills

- Paradox - pilots today are less likely to encounter an emergency, but also less likely to be able to manage when they do...
FAA - New type of accident

- FAA review of accidents 2001-2009
- Interim “Safety Alert” Jan 2013, urging airline pilots do more manual flying
- 279 page report released Nov 2013

FAA - New type of accident

- “Relying too heavily on computer-driven flight decks now pose the biggest threats to airliner safety world-wide”

- “A significant percentage of airline pilots rely excessively on computerized cockpit aids”
AF 447 June 2009, 228 killed
AF 447 June 2009, 228 killed

- Failed to avoid weather cell
- Minor issue with sensor caused loss of some automation, which required nothing
- Crew confused, overloaded, lost situational awareness, loss of cognitive control
- Continuous stall 35,000 feet – a plane they had been taught “couldn’t stall”
Asiana 214 July 2013, 3 killed

- ILS at San Francisco down for maintenance
- Visual (manual) approach
- Too low, too slow
- Hit sea wall before runway
Asiana 214 July 2013, 3 killed

- Asiana’s policy emphasised full use of automation & discouraged manual flying

- NTSB: due to over-reliance on automation, lack of systems understanding
US Airways 1549 Jan 2009

- No time for checklists
- Critical decision making
Healthcare – the challenges

- Ageing population
- Significant fiscal pressure
- Higher patient expectations
- Drive for increased productivity
  - Faster, cheaper. NEAT
- Less skilled workforce
  - Excessive referral
  - Over-reliance on testing
  - Reduced clinical judgement
Healthcare – the solutions

- Include
  - Clinical guidelines, pathways, protocols
  - Endless processes
    - Altered calling criteria
    - Sign of processes
  - Standardisation of care
  - Evidence based medicine
  - Electronic medical record

BUT...
There appears to be a disconnect between intent and outcome

People everywhere talking about deskilling of clinicians
"Emergency medicine is in a spiral of deskilling, trainees warn"
BMJ Careers 25 July 2014

"Deskilling doctors"
The Neuro Times: A blog about neurology and neuroscience 4 March 2011

"Deskilling of junior doctors"
BJPsych, 30 November 2007
Are clinical guidelines our equivalent of the “Magenta line”, and do they encourage automation dependency?
Do guidelines facilitate the deskilling of clinicians, in particular the degradation of clinical judgement?

If so, could guidelines (and EBM) ironically result in a lower standard of safety by deskilling physicians?
Saturday 25th April

- 2 IV lines
- ASU review
- Pan-scan
- "Wound" dressed
- Went home
Elderly male. Hypertension, poor LV function.

D&V following cruise

Arrived ~ 0200, seen 0800.

Few obs, not monitored, no bloods, no fluid. No Rx after IV cannula by ambulance

But had “Infectious precautions” sign on curtain, staff seen using PPE correctly
Automation dependency

Did we do the right thing for either of these patients?
Automation dependency

“When we become dependent on our technological slaves, we turn into slaves ourselves.”

“The Glass Cage”
Nicholas Carr, 2014
Recipe-like guidelines and algorithms lead to cognitive errors by hindering creativity and flexibility of thinking.

“How Doctors Think”
Jerome Hoffman, 2007
Deskilling and adaptation among primary care physicians using two work innovations


- 78 US primary care physicians interviewed re guidelines
- Physicians experience guidelines in ways that indicate deskilling outcomes incl decreased clinical knowledge & decreased confidence in clinical decision making.
- Physicians are actively involved in the deskilling process through the adaptive choices made when incorporating the innovations into their work.
- Hospitals must attempt to mitigate deskilling outcomes associated with these innovations
Canadian physicians' attitudes about and preferences regarding clinical practice guidelines
RSA Haywood et al. CMAJ June 15, 1997 vol. 156 no. 12

- 20 years old!
- Mailed survey to 3000 Canadian GPs, 1878 responded
- Asked about their attitudes to guidelines
- 22% - 26% had concerns about loss of autonomy, the rigidity of guidelines and decreased satisfaction with medical practice.
Growing anaesthesia literature about loss of situational awareness in the face of new technology
On the floor:

Q: "What should I do with this patient?"
A: "Just follow the pathway"
At M&M:

Q: “Why didn’t someone just stop and think?”

A: “Because we have discouraged independent thinking and de-emphasised clinical judgement”

Often anchoring bias, confirmation bias
Where are we headed?

- What happens to doctors when they leave hospital environment?
- Does following guidelines prepare doctors for independent practice?
  - for which the evidence is poor
  - which quickly go out of date
  - and which they won’t have access to anyway
May currently be experiencing the “golden age” of guidelines

We have the benefits of guidelines

But also have doctors who can work without guidelines

The future?
References
Clinical guidelines – evidence

Clinical pathways: effects on professional practice, patient outcomes, length of stay and hospital costs

- Screened 3214 papers, 27 studies, 11398 patients
- Hospital LOS most common outcome studied
- Analysis complicated by heterogeneity
  - Reduced LOS, probably reduced costs
  - Improved documentation
  - Non-significant trend to better clinical outcomes
    (only 5/27 reported complications and only 3/27 reported mortality). ? reporting bias.
Clinical guidelines – evidence

Effect of clinical guidelines on medical practice: a systematic review of rigorous evaluations
Grimshaw JM, Russell JT The Lancet Volume 342 No 8883 p 1317-22. 27 November 1993

- 25 yr old review of 59 evaluations of clinical guidelines
- Studies generally poor quality
- Mostly reported process of care. Significant improvement – 55/59
- Only 11 reported on outcome of care. 9/11 positive

- Dutch review 20 evaluations of clinical guidelines
- 17/19 assessed process of care. Significant improvement.
- 6/9 assessed health outcomes. Small improvements only.

Compared to process, the effect of guidelines on outcomes studied far less and data less convincing.

- **Design:** Chart review before & after protocol implementation.
- **Patients:** 241 DKA admitted to ICU Jan 2000 to Jan 2005.
- **Intervention:** Implementation of a mandatory protocol in May 03.
- **Measurements:** ICU and hospital LOS, time to correction of anion gap & ketone clearance.

- **Results:** Before implementation, the mean $\pm$ sd ICU LOS was 44 $\pm$ 28 hrs. After, ICU LOS 34 $\pm$ 18 hrs. Time to anion gap closure and ketone clearance also decreased (both $p < .05$).
- **Conclusion:** Implementing a mandatory protocol for treating adult patients with diabetic ketoacidosis decreases ICU LOS.
Effectiveness and efficiency of guideline dissemination and implementation strategies.

- Review of 235 studies looking at costs and efficiency of guidelines
- Overall quality of studies was poor
- Majority used process measures as primary endpoint.
- 69 reported data on economic implications of guidelines, although only 25/69 studies reported cost of guideline development, dissemination or implementation

Grimshaw JM, Thomas RE et al Health Technology Assessment 2004;8(6).