Towards personalised learning using practice analytics

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...towards personalised learning using data relating to practice
The continuum of decision support and learning ........

Decision support at point of care

Practice review and benchmarking

Just in time Micro-learning

WBA, Simulation and structured learning

data

Next Generation of personalized EMR?
Team-based data review

Improving outcomes and value of by providing clinicians and teams with access to their data

Flagship: Transparency of data to optimise clinical practice and referral
Clinical Decision support in cancer care
When engaging clinical teams in data feedback, they need to be an active participant in the process, rather than a passive recipient of information.
How do we build systems that link practice with immediate education, benchmarking and feedback around best practice and then embed this in a broader education or performance framework and support meeting new NSQHS clinical governance standards.
PhD and Post doc program

- 2 x Postdoctoral Research Fellow - Performance Feedback Standards Development
- PhD 1 - Defining clinical variation (possibly in respiratory care)
- PhD 2 - Visualising Performance Data
- PhD 3 - Sense Making with data
- PhD 4 - Attitudes toward performance data
- PhD 5 - Impact of performance feedback on organisational processes (tbc)
- PhD 6 – Patient Outcomes (tbc)
Linking education directly to data
Case-based micro-learning – a new delivery technology

A 4 yr old girl presents to the Emergency Department with ongoing lethargy and four episodes of vomiting 4 hours after a fall of about 1m from play equipment. She fell onto the back of her head and landed on concrete. On examination she is clinging to her parents and does not want to be examined. Her HR is 110, RR 24 and BP 100/60. She does not have any scalp

Shaw, TJ et al, BMJ Quality and Safety (2012) 21(10), 819-825
10-12 cases sent to 600 nurses in enrolled hospital over a 3 month period.

1) Cases responding to trends in organisational adverse event data/QI programs
   - Respond to Medication error
   - Respond to trend in falls
   - Implement VAP QI bundle

1-2 cases sent per week for 3 months

2) Cases responding to National Data such as NPSGs or National S & Q Health Service Standards
   - Identify Suicide risk
   - Prevent C Diff infection
   - Mark surgical site
   - Reduce central line infection

Linking Cases to data - Turning point – Partners Healthcare
Turning Point

• 'Most talked about educational activity in memory of hospital leaders‘ Brigham and Women's Faulkner
• 70% participation 40% completion
• Discovered Micro-learning environments
• Ward and organisational engagement crucial
• Competition very significant motivator
2014 Cancer Cup Challenge

An online game exploring safety and quality issues in medical oncology

89% Completion amongst busy registrars
Turning Point 2

How do we couple clinicians activity/performance data with their professional education?

How do we use micro-learning platforms to deliver timely education?
How do clinicians feel about their data being used?

Focus groups held with mixed teams

6 Major themes:

• Enthusiasm for feeding back clinical data
• Formative, not punitive, usage
• Desire for peer comparison, benchmarking and collaborative learning
• Data access and usage
• Challenge with capturing complex clinical narratives
• System design challenges

Shaw, T.J. et al. (2019) Medical Journal of Australia
ED Pilot study
### 2018 Westmead Emergency Pilot

#### Program overview
- 6 week program
- 47 cases
- 8 patient presentation categories

#### Engagement
- Case lists extracted from EMR overnight
- If case match then case sent within 24 hours
- On average participants received 16 cases

#### Feedback
- The program was well received.
- The early career doctors were excited about having their training linked to clinical practice.
- Enjoyed the cases and found them relevant to their practice.
John is a 55 year old male who presents to the Emergency Department with acute chest pain. On arrival he states he has residual 2/10 central chest pain relieved after antacids. He has had multiple episodes of the pain today that have spontaneously resolved. The longest episode lasted 25 minutes. He works as a sales assistant and is a smoker (25 pack years). There are no other reportable cardiac risk factors.

Regarding the chest pain, which one of the following statements is most correct.

Unremitting pain lasting more than 12 hours is never due to ACS
Burning or indigestion is very rarely associated with ACS
Pain that is reproducible and chest wall palpation always excludes ACS
Pain radiating to the right arm or shoulder is predictive of Acute Coronary Syndrome (ACS)

Take Home Message:
No one factor can reliably rule out ACS in the ED setting. Pain radiating to the right shoulder/arm is considered more specific for ACS than pain radiating to the left arm.

Further Explanation:
While a detailed chest pain history, serum troponin levels and serial ECG assessment are important in the patient presenting with acute chest pain.

It turns out that pain radiating to the right arm has been shown to be more specific for ACS than pain radiating to the left arm. The typical pain you learned about in medical school (central crushing pain) is classically seen in men, and younger patients, but the lack of the this history does not rule out the diagnosis.

7% of patients with acute myocardial infarction have reproducible chest wall pain and that many ACS patients respond quite well to the administration of GDMT treatments such as nitrates and antacids.

Unremitting pain should raise concerns about the possibility of Aortic Dissection, especially with risk factors such as Marfan syndrome or hypertension. Continuous pain should prompt serial ECGs. Unresolved pain is concerning and should prompt discussion with a senior doctor.
Observed interaction of fellows with EMR

Identified top 100 path orders and key learning issues with registrars

Developed 34 learning cases and identified data points needed to trigger learning case

Piloting November

Next step work with fellows on embedded performance feedback
Appropriate Test Ordering
- Investigating renal impairment
- Investigation of hyperbilirubinaemia

Interpreting Results
- Interpretation of low pH
- Interpretation of high pH
- Interpretation of high lactate
- Interpreting iron studies

Patient Management
- Management of acidemia
- Management of alkalemia
- Management of hyperkalemia
- Management of Hypoxemia
- Management of hypercalcaemia
Practice analytics – a vision?

- EMR
- MBS/NPS etc
- Registries
- PROMs/PREMs
- Claims data
- Assessment
- Complaints/
  regulatory data

Analyse and understand practice and performance of teams and individuals

Integrated into next gen EMR

Personalised, information driven High Impact Learning at coal face

Professional Performance Framework