Digital Alerting and the future

Sarah Stanley Consultant Nurse RFL
Sepsis

Worldwide problem – 150,000 cases per year 44,000 deaths UK likely 30-50% preventable -UK Sepsis Trust

Major cause of mortality and morbidity
Lots of detailed research about treatment
BARNET OBSTETRICS SEVERE SEPSIS 6 PROTOCOL- Draft 2

MRN: Patient name: DOB:

Should you consider severe sepsis
Are there ≥2 of the following signs of infection and poor organ perfusion?
- SBP less than 90mmHg or 40 below norm
- Temp >38°C or <36°C
- HR > 125/min
- RR > 25/min
- Altered mental status
- Urine <0.5ml/kg for 2 hrs
- Lactate > 4.0mmol/L
- pH<7.25

YOUR PATIENT MAY BE SEVERELY SEPTIC!
This is a medical emergency.

Commence SEPSIS 6 interventions
(complete within 1 hour of diagnosing Sepsis)

1. Oxygen to all patients (regardless of O₂ saturations)  Please tick mode of delivery:
   - Non rebreathe mask 10-15l/ min
   - OR nasal specs

2. IV fluid challenge 15ml/kg over 15 mins pre-eclampsia/diagnosed renal or cardiac failure 250ml stat & review

3. Blood cultures at least 2 and before IV antibiotics
   (If taken ≥ 2hrs ago, please repeat.)

4. IV Antibiotics - see obstetric sepsis guidelines

5. Lactate Arterial or Venous acceptable

6. Fluid Input/ Output chart

- Monitor Observations (MEOWS) every 15 minutes (BP, HR, RR, SpO2 reading)
- Large bore IV access, bloods including HB, WCC, CRP, Clotting
- Escalate response as appropriate (Consultant on call/PARRT bleep 2828, ITU, Paeds Registrar 2900, Microbiology Registar)
- Septic screen: MSU/ HVS (with speculum), LVS/ wound/ sputum/ CXR
- Consider CVC insertion/review need for early vasopressor support
- Consultant to consultant referral for ITU admission
Nurse Sarah explains the Royal Free's groundbreaking sepsis work to Jeremy Hunt and Melissa Mead - #NHSheroes
What People Think Success Looks Like:  

What Success Really Looks Like:
Understanding the current process

- Observations recorded manually and relies on human/clinician to call for help.
- Lab rings through very abnormal blood results
- Teams, like PARRT/outreach respond to calls if they are called
- Clinicians review bloods on the computers on the wards
- Patients can be on an outlier ward, with a bank nurse and a locum dr taking care of them
Can DeepMind help alert us earlier about life threatening acute kidney injuries?

"Can DeepMind help alert us earlier about life threatening acute kidney injuries?"

Dr Chris Laing
Consultant Nephrologist
Royal Free London

The challenge

Acute Kidney Injury (AKI)

40,000
Deaths / Year in England

25%
Contributes to a quarter of all hospital admissions

£1.2 billion
Cost to the NHS
Why are the kidneys important?

The kidneys work 24/7 and consume a quarter of our body energy to….

• Filter and purify our blood, removing wastes
• Maintain our salt and water balance
• Remove acid
• Remove drugs and chemicals
• Keep our bones healthy
• Make EPO – this helps us make red cells to carry oxygen
How is AKI defined?

We measure a blood test called serum creatinine (cr). This is produced by muscle at a constant rate and if it goes up it usually means a loss of kidney function.

1 x rise (from a 7 day baseline) = AKI stage 1
2 x rise (from a 7 day baseline) = AKI stage 2
3 x rise (from a 7 day baseline) = AKI stage 3
How is AKI defined?

AKI is also present if a patient’s urine volume has fallen critically.

A normally urine volume is 0.5mls/kg/hr (eg 50mls/hr for a 100kg patient).

If a patient has 6 hours of oliguria (ie urine volume low for each of 6 consecutive hours) they have AKI.
What causes AKI?

‘think STOP-AKI

Sepsis or hypoperfusion
Toxicity
Obstruction
Primary renal disease
Mobile first alerting at RFH Jan 2017
Current pathway of sending patient alert to right clinician

**Accelerated detection to Streams pathway of delivering an accelerated alert**

- **Test ordered**
- **Results available**
- **Results automatically checked by Streams**: AKI detected
- **Result escalated to Specialist automatically via mobile including relevant historic data**
- **Specialist visits bedside if the data shows that the patient is at risk**
- **Time saved using Streams means more time with patients**
Streams AKI alerting

Use Streams Safely

No Screenshots
Any screenshots will be logged and shared with your Caldicott Guardian.

Protect your Account
Make sure other clinicians use their own account.

Lock your Device
This keeps patient data safe if you lose your device.

Start Using Streams

JONES, Robert
3 Jan 1925 (93y), Male
NHS 123-456-7890
South 6 Ward, Bay West A, Bed 14

Overview  Observations  Pathology  Radiology

AKI 3 with complications
Sep 6, 12:15
Reviewed by Adam Benton

Allergies
View 5 allergies

Ward Admission Details
South 6 Ward, Bay West A, Bed 14
4 Jun 2017, 11:00
Dr Chris Laing
Nephrology

Urea
14 mmol/L

Sodium
249 mmol/L

Lab ref. range 115 mmol/L - 250 mmol/L

World class expertise + local care

Royal Free London
NHS Foundation Trust
We are exploring new features such as vital signs and NEWS 2.
Also getting great feedback from our clinicians

"With the app we are able to detect pretty much all kidney disease across the hospital. We are getting to intervene on patients we wouldn’t normally be able to. The results viewing platform is saving us LOTS of time!"

"The app is awesome. I have never had such a great time looking at results. I am finally realising my childhood dream of being "Bones" (Dr McCoy) from "Star Trek"

"The Streams app is brilliant! With it I feel very empowered. We are now able to monitor problems in patients across the entire hospital."

Medical SpR
Consultant Physician
Professor of Medicine

More than 250 user interviews within the past 24 months
The early results are really encouraging - we are delivering prompt consultant led care in a really important area

- >150K blood tests
- >6K AKI detection messages
- >3K alerts to specialist team

485 moderate AKI episodes
525 severe episodes

Nearly 50% of alerts were seen by nephrologist within 10 minutes
Median of 12 minutes after alert was generated

1300 bedside clinical reviews of AKI patients by specialist team
We are hearing positive stories from patients with independent evaluation underway.
Our work has generated excitement but also controversy

DeepMind and the NHS: What it's really like to use Google's kidney health app

Google DeepMind's NHS deal under scrutiny

By Jane Wakefield
Technology reporter

Google DeepMind’s Streams technology branded ‘phenomenal’

FINANCIAL TIMES

Fears raised over Google’s DeepMind deal to use NHS medical data

Don’t let privacy fears halt a health revolution
Really important that patients are aware of how their data is used.
In the future Streams will use AI, but it doesn’t now.
And ultimately patients need this type of technology too.
Thank You