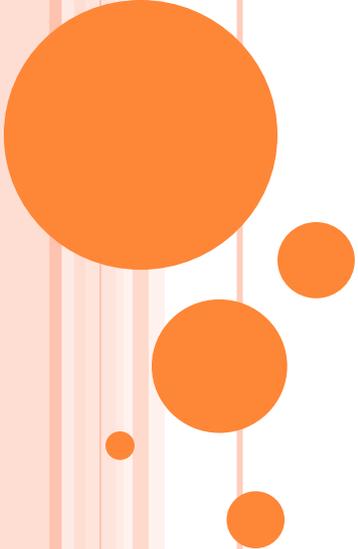


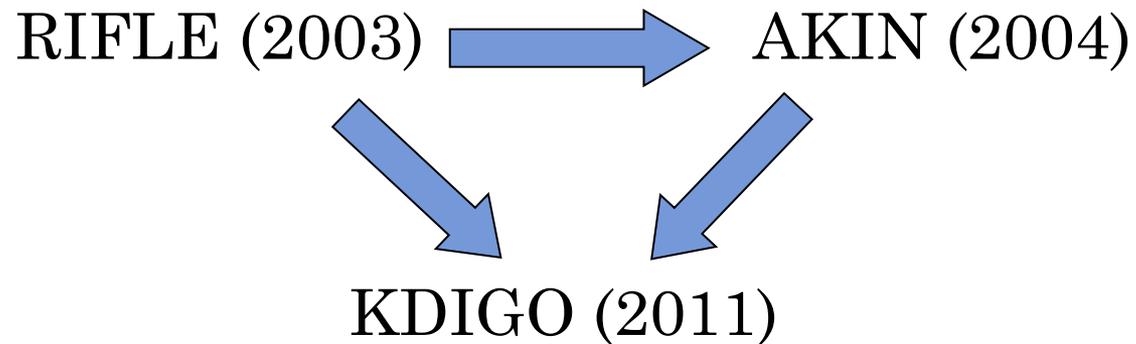
AKI LAB ALERTS



Gemma Minett
Principal Clinical Scientist
Clinical Chemistry
Sheffield Teaching Hospitals

DIAGNOSIS OF AKI

- Acute = sudden decline in renal function
 - but how sudden?
 - how much of a decline?
- No clear consensus but recognition that early diagnosis and classification important
- Guidelines:



KDIGO – DEFINITION/STAGING

KDIGO (within 48 hours and 7 days)

Stage	Serum creatinine ($\mu\text{mol/L}$)	Urine output
1	Crea \uparrow 1.5x in 7 days Crea \uparrow \geq 26.5 $\mu\text{mol/L}$ in 48 hrs	$<0.5\text{mL/kg/h}$ for 6 hours
2	Crea \uparrow 2x in 7 days	$<0.5\text{mL/kg/h}$ for 12 hours
3	Crea \uparrow 3x in 7 days Crea \geq 354 and meets stage 1 criteria of acute injury. Initiation of RRT	$<0.3\text{mL/kg/h}$ for 24 hours OR anuria for 12 hrs



NATIONAL KIDNEY PROGRAMME

- Given early detection of AKI is important, and the poor performance in this area, a system was needed to alert Clinicians to developing AKI in real time
 - NHS England developed a Nationally agreed algorithm for detecting AKI based on the KDIGO guidelines
 - A Patient Safety Alert notice was issued stating that the NHS England algorithm must be implemented by 9th March 2015
 - For Secondary Care ONLY
 - The Care Quality Commission (CQC) will enforce the use of the AKI warning algorithm
- 

ALGORITHM SUMMARY

Stage	Serum Creatinine ($\mu\text{mol/L}$)
1	Crea $\uparrow \geq 1.5\text{x}$ from baseline Crea $\uparrow \geq 26 \mu\text{mol/L}$ in 48 hr
2	Crea $\uparrow \geq 2\text{x}$ from baseline
3	Crea $\uparrow \geq 3\text{x}$ from baseline Crea ≥ 354 and meets at least stage 1 criteria Crea $> 3\text{x}$ Upper limit normal in <18 year old

SELECTING BASELINE CREATININE

○ Algorithm looks at:

1. Is there a previous creatinine within the last 0-7 days?
 - If yes, use the **lowest** creatinine in that time as the baseline for change

AND

2. Is there a previous creatinine within the last 8-365 days?
 - If yes, use the **median** creatinine over that time as the baseline for change



Report the highest (worst) stage generated from these 2 scenarios



ADDITIONAL RESULTS

- AKI risk: AKI cannot be excluded as no baseline creatinine available within last year



WHAT WE REPORT ON ICE

Patient Search

Reporting

View Patient Reports

Hidden Reports By Patient

Latest Reports (Unfiled)

Hidden Reports By Sample

< File File & Next > Back < Cumulative > All Print Hide Audit Trail

Reported	Specialty	Location	Clinician	Status
 20 Feb 2015 15:50	Chemical Pathology	Robert Hadfield 3 NGH	Dr A LOBO (AL1) Gastroenterology (General Medicine)	F

Additional information is available for this report

- [AKI AKI Care Bundle Checklist and Quick Ref Guide \(20 Feb 2015 15:54\)](#)
- [Nursing Care Guideline \(20 Feb 2015 15:54\)](#)

This report is linked to other reports. Click on the links below to see these linked reports:

- [UE, Corrected Calcium, Routine Biochemistry \(20 Feb 2015 15:38\)](#)

Reasons for Request:
aspiration.

Sample XXXXXXXXXX (BLOOD) Collected 20 Feb 2015 08:35 Received 20 Feb 2015 09:51

AKI STAGE

AKI Warning Stage	
	1

The change in creatinine result **suggests** that this patient may have Acute Kidney Injury (AKI). Please review patient and refer to attached guidelines. In the presence of acute kidney injury, eGFR and CKD stage will be invalid.



Quick Reference AKI Summary Sheet and Referral Flow Chart

Risk of AKI

At risk patient = High Risk Group + Insult

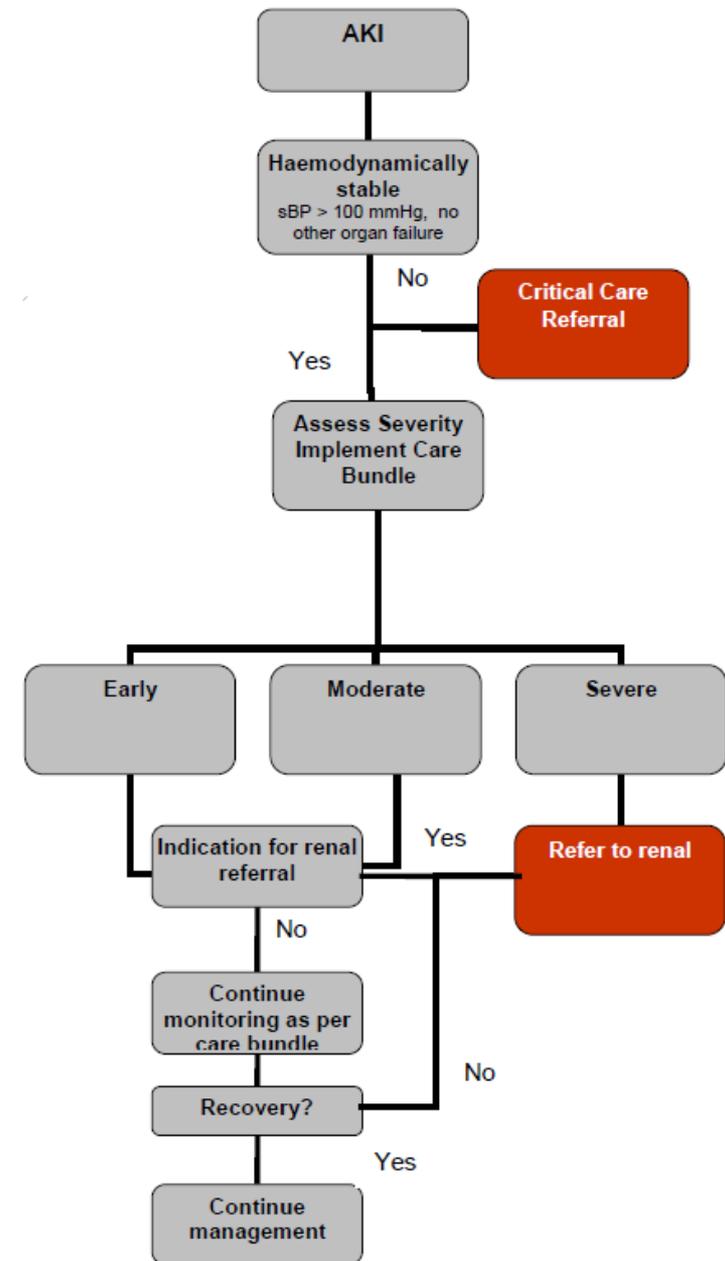
Those patients should be identified on admission or with every change in clinical status

High Risk Groups	Common Insults
CKD (especially diabetic and elderly)	Hypotension (absolute or relative)
CCF	Nephrotoxic medications
Multiple Myeloma	Iodinated contrast medium
	Sepsis

Risk increases with age, number of risk factors, number of insults / severity of acute illness and the presence of diabetes mellitus.

Defining AKI

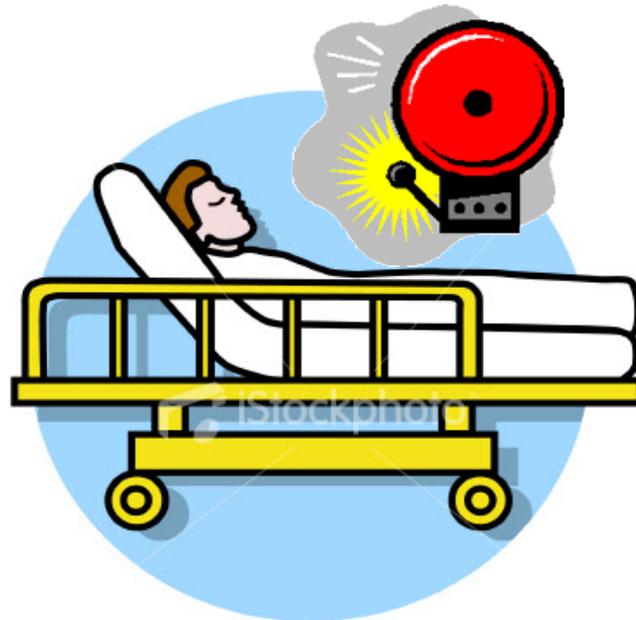
Stage	Urine output	OR	
		Relative Creatinine Rise	Absolute Creatinine / creatinine rise
I (Early)	less than 0.5 mL/kg/min for 6 hrs	1.5-2 fold rise	greater than 26 µmol/l
II (Moderate)	less than 0.5 mL/kg/min for 12 hours	2-3 fold rise	
III (Severe)	less than 0.5 mL/kg/min for 24 hours or anuria greater than 12 hr	greater than 3 fold rise	greater than 350 µmol/l (with a greater than 44 µmol/l acute increase)



- False positives and negatives do occur but they are much much fewer than the true alerts
 - e.g. drip arm sample
- Alerts should always be acted upon!
- At STH a Renal profile is added on to all AKI 3's but if you need to add it to any others you can by using the clinical chemistry add-on online request form (on intranet)



- Generating e-alerts is a 2 step process:
 1. Detection of creatinine changes suggestive of AKI (using the algorithm)
 1. Alerting the clinicians to an AKI result
 - Results sent to hospitals' results reporting systems e.g. ICE
 - In the future we would like a more sophisticated electronic alert



MORE FUTURE PLANS

- Creatinine measurements outside of the lab
 - Point of care testing
 - A&E measure creatinine on their blood gas analysers and CT department on a point of care analyser
 - Ideally any creatinine measured on a patient would be included in the AKI algorithm
 - However, not all creatinine methods are comparable
 - Not always easy to get the results from these into the Lab IT system
 - Other hospital labs
 - Patients referred from outside Sheffield will have baseline creatinine levels at neighbouring labs
 - Similar issues as with POCT



PRIMARY CARE

- We don't currently report AKI alerts to GP's
- NHS England say this is part of phase 2 and should be in place by April 2016
- Education for GP's is required first



THANK YOU,
ANY QUESTIONS?

