

KNOWLEDGE OF GUIDELINES FOR CONTRAST ENHANCED CT WITH RENAL IMPAIRMENT

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WALES RADIANT GROUP

OBJECTIVES

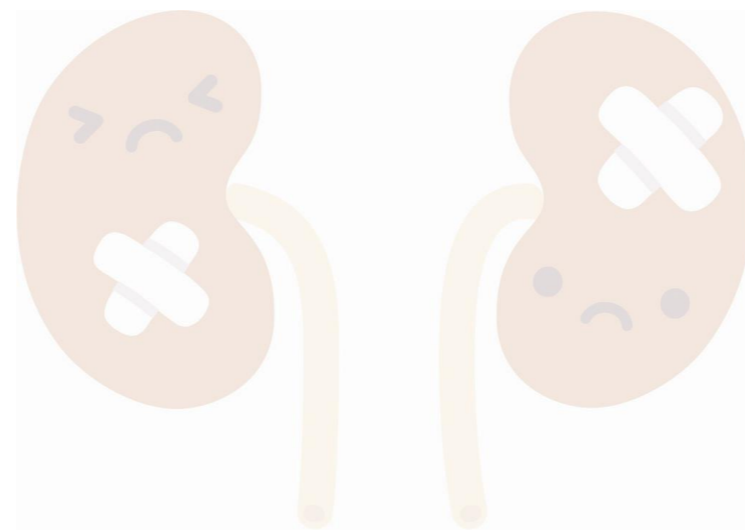
- ▶ What is RADIANT?
- ▶ Welsh RADIANT branch AKI audit
 - ▶ What is contrast induced AKI?
 - ▶ Brief flavour of current literature regarding contrast induced AKI
 - ▶ Guidelines for contrast enhanced CT in impaired renal function
 - ▶ Welsh guidelines for contrast enhanced CT and renal impairment
 - ▶ All-Wales audit design
 - ▶ Results
 - ▶ Implications and next steps
- ▶ Questions and comments

INTRODUCTION: WHAT IS RADIANT?

- ▶ ‘The Radiology Academic Network for Trainees’
- ▶ Trainee audit and research network supported by the RCR and the National Institute of Health Research
- ▶ First national project – AXR
- ▶ **Wales branch**
 - ▶ 12 members, currently all from South Wales training scheme
 - ▶ Regional lead Dr Bleddyn Woodward
 - ▶ First regional project attempted by Wales branch of RADIANT concerned with Welsh Scientific Advisory Committee (WSAC) guidelines on contrast enhanced CT in impaired renal function.

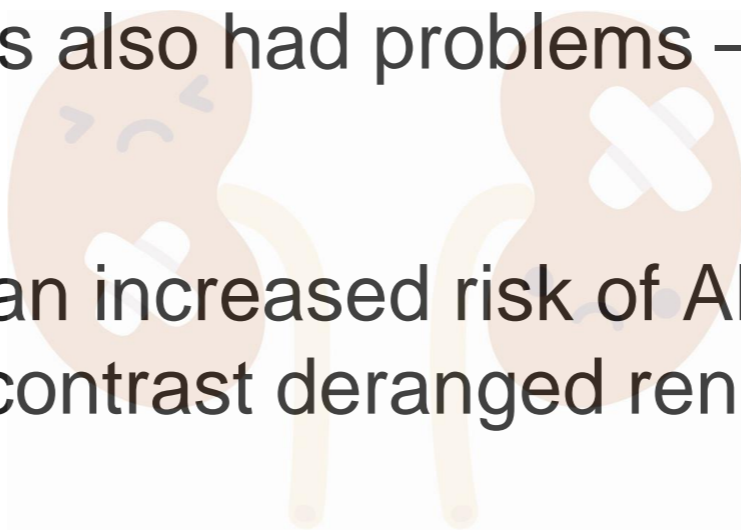
CONTRAST INDUCED ACUTE KIDNEY INJURY (CI-AKI)

- ▶ Sudden compromise in renal function 24-48 hours (or up to 72hours) following administration of contrast medium¹
- ▶ Increase in serum creatinine >25% baseline¹
- ▶ Creatinine peaks 3-5 days following contrast¹
- ▶ Most important risk factor for developing AKI as an inpatient is chronic renal impairment
- ▶ Some authors suggest as much as 10% of inpatient AKI can be attributed to IV contrast administration¹



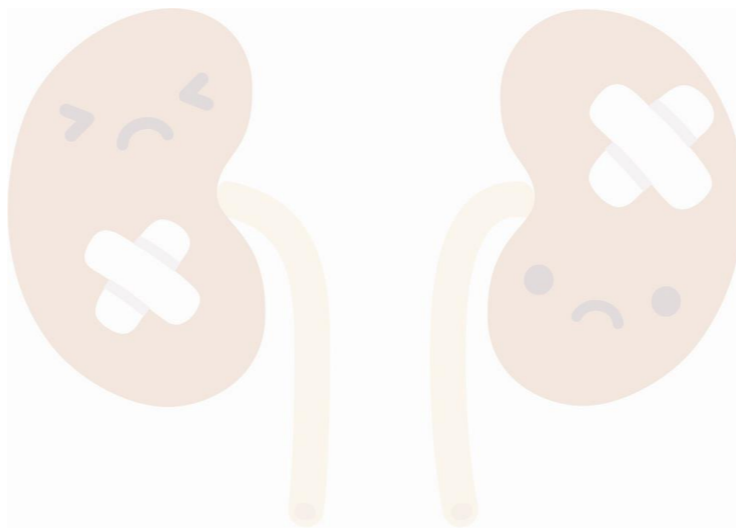
CONTRAST INDUCED AKI – THE CONTROVERSY

- ▶ Initial studies demonstrating high rates of CI AKI have been heavily criticised
 - ▶ Lack of control group undergoing non con CT²
 - ▶ Extrapolation from results on intra-arterial contrast
 - ▶ Sick inpatients are over represented in literature²
 - ▶ Logical fallacy — assumption that any increase in creatinine following contrast represents contrast induced AKI³
- ▶ Several groups have subsequently published results indicating no increased risk of AKI after IV contrast⁴⁻⁷
 - ▶ However these studies also had problems – control group selection bias
- ▶ Best evidence supports an increased risk of AKI after IV contrast **ONLY** in those with pre contrast deranged renal function^{3,6,8}



RECOMMENDATIONS: CONTRAST INDUCED AKI

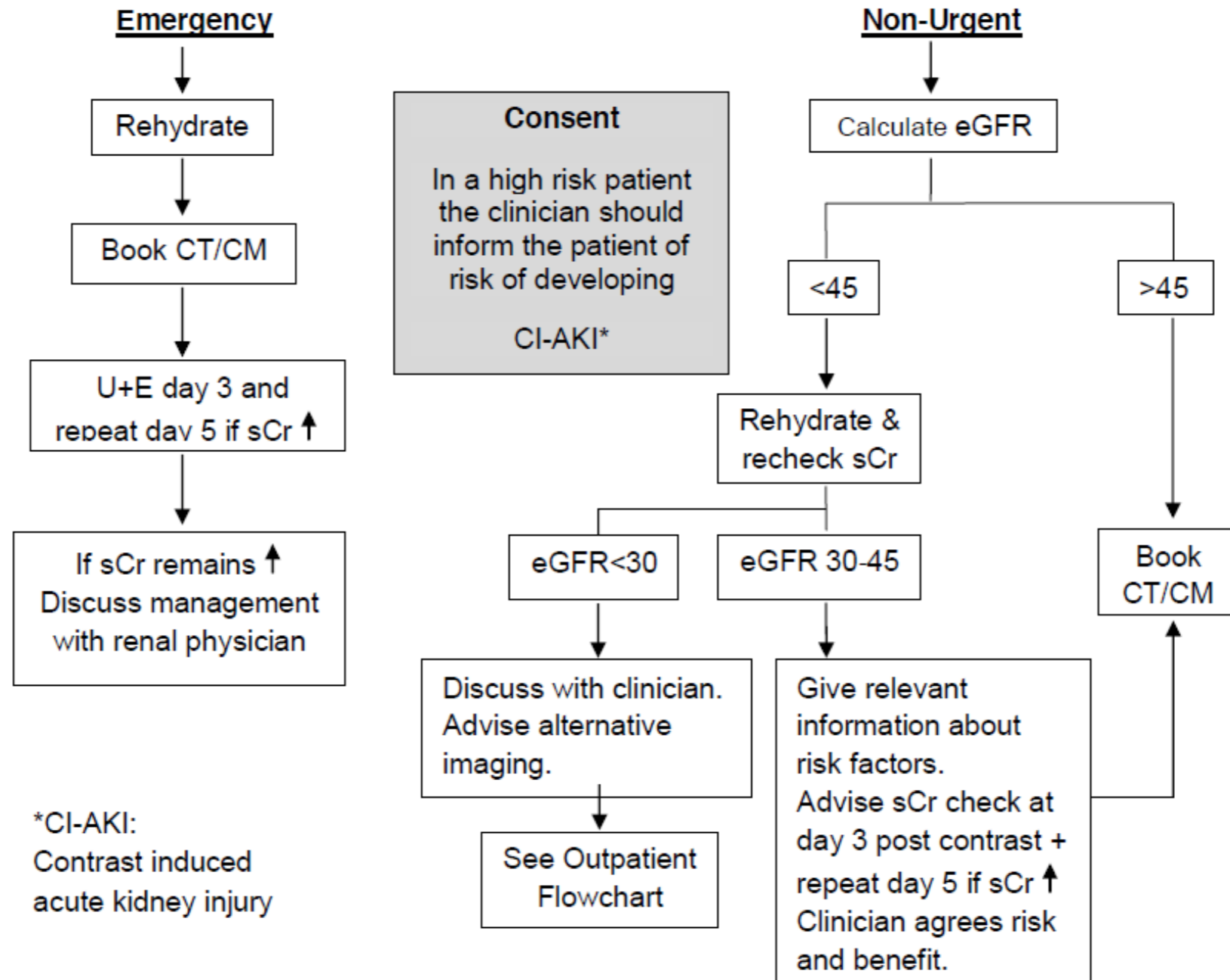
- ▶ Despite controversy there is evidence supporting a risk of AKI after contrast (especially with pre-existing renal disease) ^{3,6,8}
- ▶ Complicated and confusing with different agencies recommending different risk levels e.g.
 - ▶ **NICE** – eGFR < 40 ml/min are at particular risk of CI-AKI⁹
 - ▶ **European Society of Urogenital Radiology** – eGFR < 30ml/min is a risk factor for CI-AKI¹⁰
 - ▶ **Renal Association** – Risk of CI-AKI becomes clinically important with eGFR <60ml/min²
 - ▶ **RANZCR** – risk uncertain with eGRF <45ml/min but is greatest in those with eGFR <30ml/min¹¹. This is the advice endorsed by the RCR



- ▶ Welsh Scientific Advisory Committee put together an expert panel to review recent evidence and in 2018 published a national guideline:
- ▶ “Guidance on Administration of Intravenous Contrast Medium to Patients with Renal Impairment”¹³
- ▶ Based predominantly on NICE and ANZCR guidelines
- ▶ Designed to be simple to follow and easily accessible

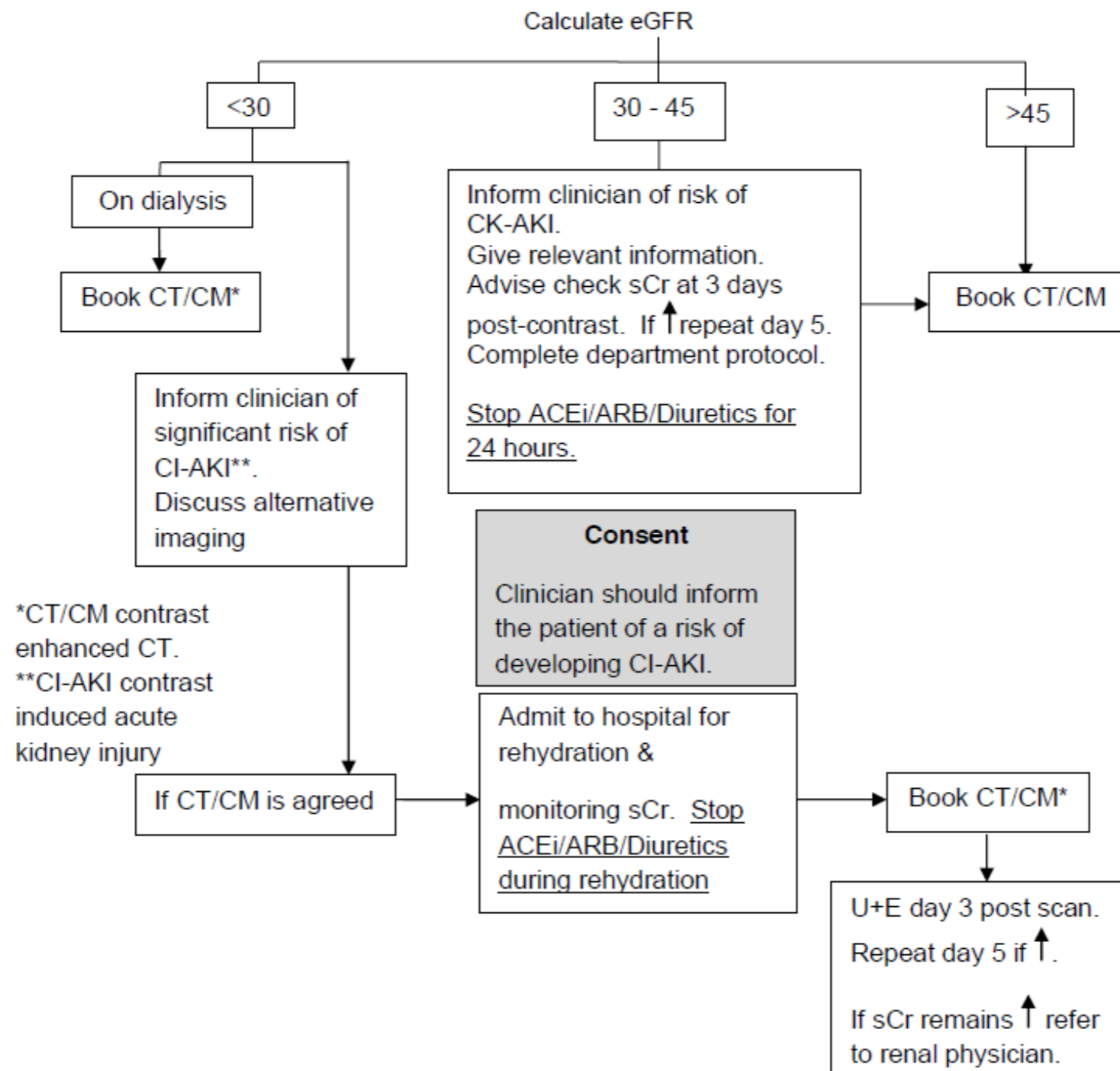
WSAC GUIDELINES — INPATIENTS

Guideline for Management of INPATIENTS with renal impairment who require intravenous contrast medium administration



WSAC GUIDELINES — OUTPATIENTS

Guideline for Management of OUTPATIENTS >65 years with renal impairment who require intravenous contrast medium administration



WALES RADIANT GROUP AND CIAKI

- ▶ WSAC guideline selected as the subject of the first project attempted by RADIANT Wales
 - ▶ Anecdotal variation in practice/lack of awareness of guideline
 - ▶ As guideline designed for use across Wales, well suited to testing the collaborative data collection model
- ▶ 12 members working in 4 health boards allowing us to collect data from a wide geographical area
- ▶ Project lead appointed to collate and analyse data
- ▶ Regular meetings outside work hours held at National Imaging Academy of Wales
- ▶ WhatsApp group
- ▶ Documents shared via Drop Box

AIMS/METHOD

- ▶ Nine question survey was designed aiming to assess:
 - ▶ Knowledge of the guideline
 - ▶ Confidence applying it
 - ▶ Agreement with guideline in a range of fictional clinical scenarios
 - ▶ Feasibility of collaborative data collection model
- ▶ Surveys distributed to radiology consultants and registrars in four health boards between late April/early May 2019
- ▶ Anonymised surveys were collected and results collated by a single trainee

QUESTIONNAIRE

1. Are you aware of local guidance regarding contrast use?

Y/N

If yes - how confident are you in applying the guidance in everyday practice?

1 - not at all, 2 - minimally, 3 - moderately, 4 - confident, 5 - very confident

2. Are you aware of national guidance regarding contrast use?

Y/N

If yes - how confident are you in applying the guidance in every day practice?

1 - not at all, 2 - minimally, 3 - moderately, 4 - confident, 5 - very confident

3. A 68 y/o outpatient has an eGFR of 33, this is longstanding.

Would you protocol for IV contrast administration? Y/N

Any further recommendations?

4. For an outpatient with stable renal function what is the oldest acceptable eGFR result?

5. An outpatient has an eGFR of 46, this is longstanding.

Would you protocol for IV contrast administration? Y/N

Any further recommendations?

6. An outpatient has an eGFR of 28, the patient is on dialysis.

Would you protocol for IV contrast administration? Y/N

Any further recommendations?

7. An inpatient has renal impairment but requires an emergency contrast study.

Would you protocol for IV contrast administration? Y/N

Any further recommendations?

8. An inpatient needs a non urgent (ie not same day) scan. Would you protocol for IV contrast administration if?

a. eGFR = 47 Y/N

b. eGFR = 39 Y/N

c. eGFR = 26 Y/N

Any further recommendations?

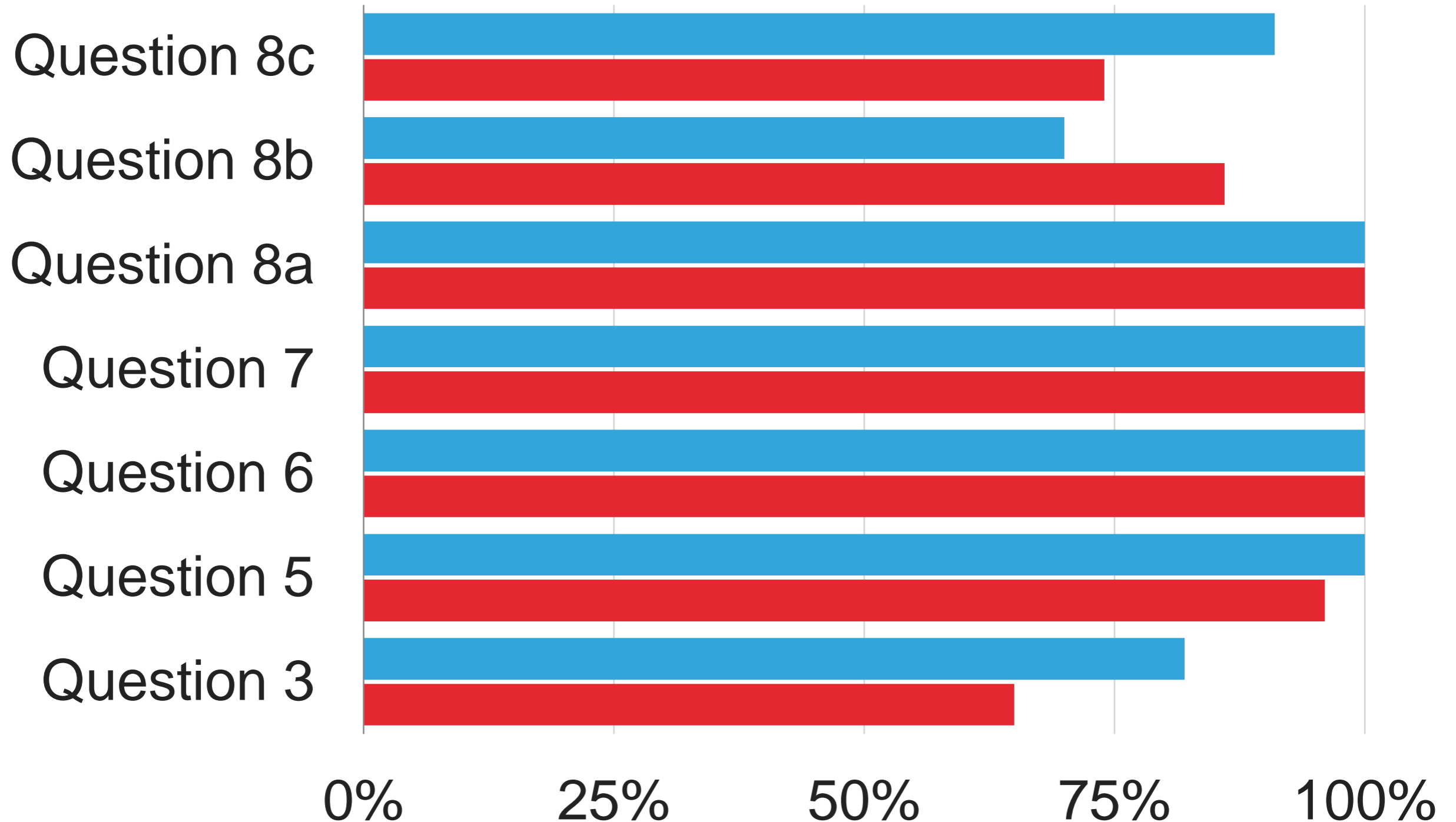
9. Who is responsible for checking and acting on follow up renal function tests for outpatients?

RESULTS

- ▶ **34 radiologists** returned surveys
 - ▶ 23 consultants
 - ▶ 11 registrars
- ▶ 8 participants (24%) had no awareness of the guideline
- ▶ Of the 26 who were aware, confidence applying the guideline varied
 - ▶ Average consultant confidence – 3.6/5
 - ▶ Average registrar confidence – 3.1/5
 - ▶ 2 did not rate their confidence

AGREEMENT WITH GUIDELINE – DECISION TO GIVE CONTRAST

■ % Registrar agreement ■ % Consultant agreement



ADDITIONAL RECOMMENDATIONS

- ▶ The guideline offers recommendations as to when/how to advise clinicians in higher risk patients receiving IV contrast
- ▶ The survey attempted to assess this by asking people to write down their recommendations for each scenario
- ▶ Answers offered were highly variable and often missed the main points recommended in the guideline

FOR EXAMPLE... QUESTION 3

- ▶ *“A 68 y/o outpatient has an eGFR of 33, this is longstanding.*
- ▶ *Would you protocol for IV contrast administration? Y/N*
- ▶ *Any further recommendations?”*

- ▶ **10** people would **not give IV contrast** (8 cons, 2 SpR)
- ▶ **24** (15 cons, 8 SpR) people said **yes to IV contrast** but nobody explicitly mentioned the following recommendations:
 - ▶ Inform clinician of risk of AKI and discuss indication to ensure contrast is appropriate/necessary
 - ▶ Stop nephrotoxics
- ▶ Only 2 registrars advised to check eGFR within the correct timeframe of 3 days post contrast administration

RESULTS SUMMARY

- ▶ 24% of South Wales radiologists had no awareness of national guideline regarding contrast enhanced CT and renal impairment
- ▶ Of those that knew, many had low confidence applying the guideline
- ▶ Generally, people agreed with the decision to give contrast or not
- ▶ Recommendations to clinicians varied significantly both between and within a particular health board
- ▶ Consequences of varied clinical practice may include avoidable AKI or excessive monitoring of low risk patients

LIMITATIONS

- ▶ Small cohort
- ▶ Open ended questions in survey complicate interpretation of results
 - ▶ What exactly is meant by response?
 - ▶ Incomplete answers, missed questions
- ▶ Does not represent actual practice – asks what someone *would* do

NEXT STEPS

- ▶ Continue to exploit a collaborative approach in order to:
- ▶ Provide education across South Wales
 - ▶ Sign posting to guideline
 - ▶ Improving accessibility of guideline
 - ▶ Education sessions for radiologists/CT radiographers
- ▶ Re-audit
 - ▶ Expand catchment to include West and North Wales
 - ▶ Increase numbers in South Wales trusts
- ▶ Further studies across Wales, recording actual practice as well as incidence of contrast induced AKI to help add to the evidence base

LESSONS LEARNT FROM OUR COLLABORATIVE WORK

- ▶ Collaborative trainee data collection worked well
- ▶ Number of trainees involved means workload small for any individual
- ▶ Trainee network has massive potential to implement change over a wide area in a relatively small period of time
- ▶ The allocation of a project lead is important
 - ▶ Co-ordinate meetings and ensure efficient running of project
 - ▶ Focus on analysis
- ▶ Issues surrounding authorship raised
- ▶ All interested trainees given opportunity to lead a project and contribute to central RADIANT committee

CONCLUSIONS

- ▶ RADIANT aims to encourage collaborative audit and research projects by radiology trainees
- ▶ The first project by the Wales branch of RADIANT has demonstrated feasibility of a collaborative trainee network
- ▶ Efficient data collection over a wide geographical area
- ▶ Results indicate varied practice both within and between South Wales health boards
- ▶ **Massive scope for re-education and improvement of practice across South Wales, using members of our trainee network to implement change**

QUESTION

S?

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