

Advanced Practice in Diagnostic Imaging

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Clinical Academic Reporting Radiographer

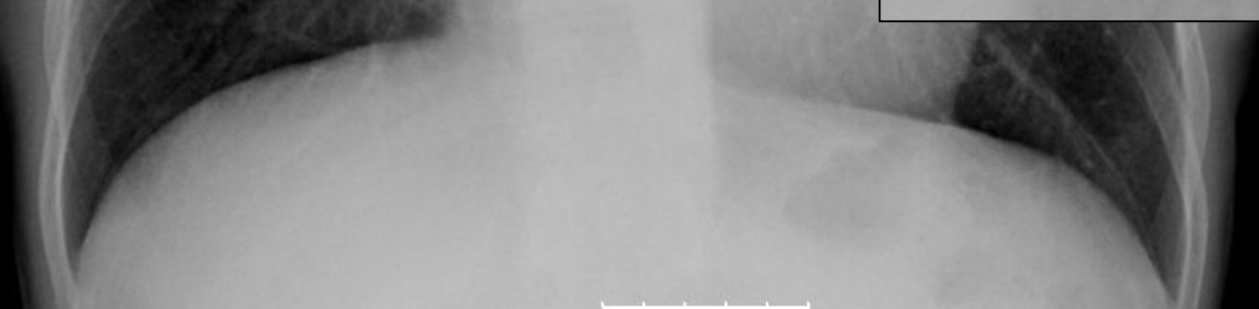
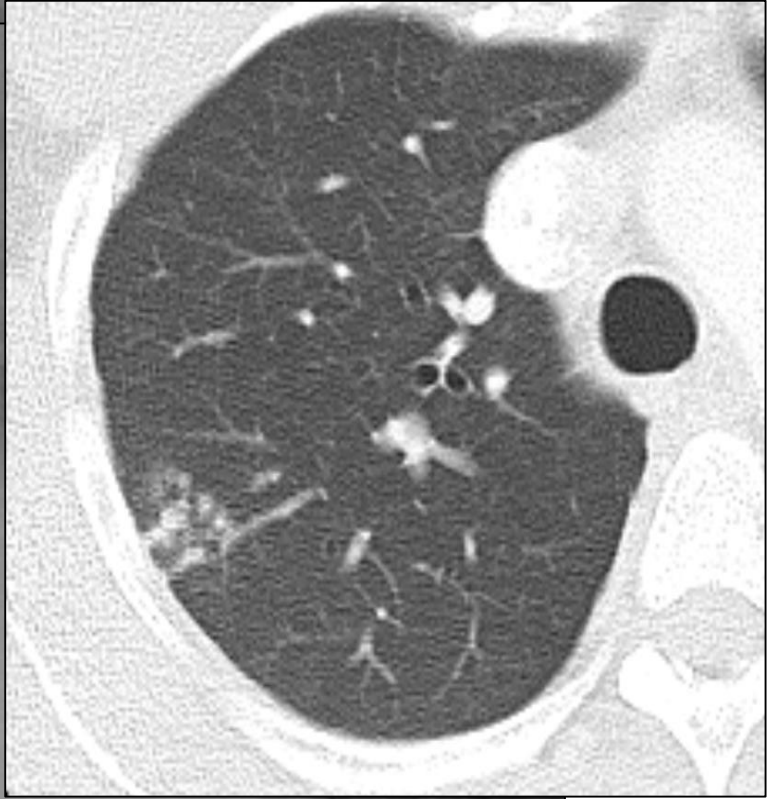
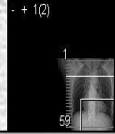
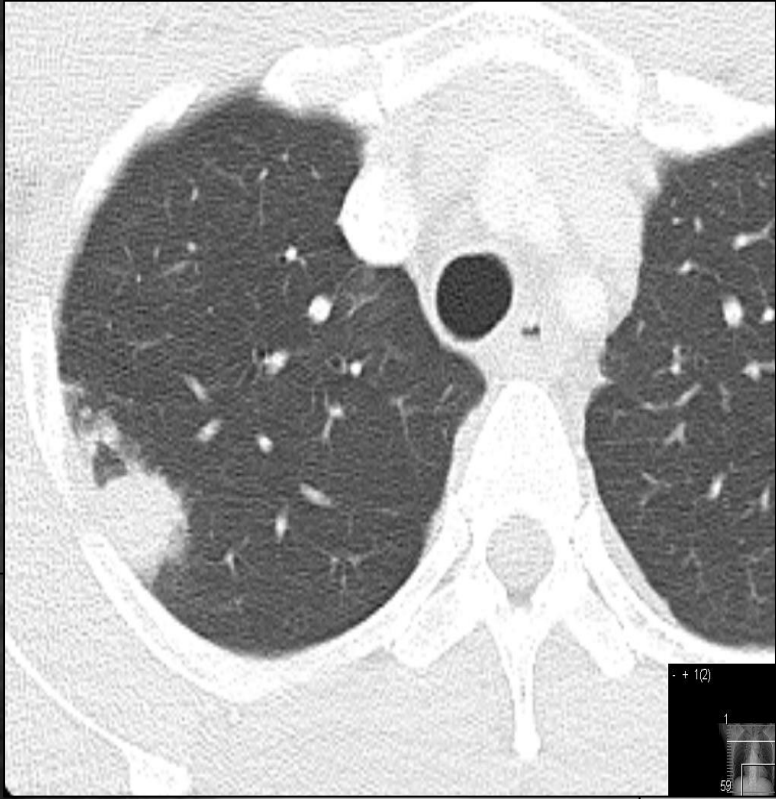
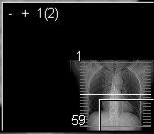
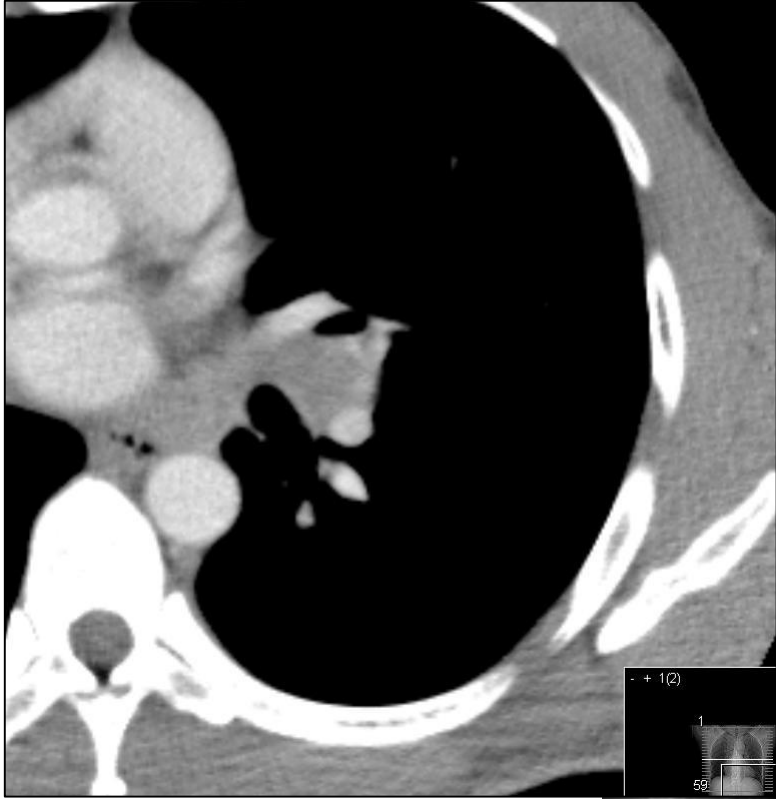
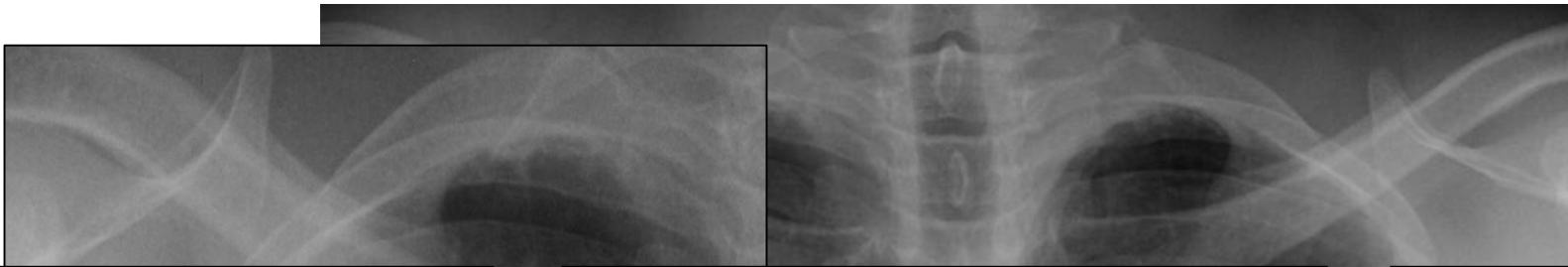
2016 CAMRT Annual General Conference

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Disclosure

- Research Funding: College of Radiographers (UK) & International Society of Radiographers & Radiographic Technologists



Overview

- What is an advanced practitioner?
- Why advanced practitioner radiographers?
- The path to advanced practice with a journey through the evidence
- Challenges and opportunities

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What is an Advanced Practitioner?

“Advanced practice in Medical Radiation Technology is defined as a higher level of practice wherein clinical responsibilities routinely exceed the current principal expectations of practice.”

Canadian Association of Medical Radiation Technologists 2014



“Occurs when a practitioner is regularly performing beyond the core practice boundaries of the profession on a regular basis with appropriate availability of resources, educational underpinning and professional mentorship.”

Australia Institute of Radiography 2014



“A role, requiring a registered practitioner to have acquired an expert knowledge base, complex decision-making skills and clinical competences for expanded scope of practice, the characteristics of which are shaped by the context in which the individual practices.”

Health Education England 2014



The Society & College of
Radiographers

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Core Advanced Practice Domains

- Expert Practice
- Leadership/Service Transformation
- Education
- Service Evaluation/Research
- Higher Level Practice
- Critical Thinking
- Complex Decision Making
- Autonomy
- Leadership
- Clinical Expertise
- Evidence-based Judgement
- Scholarship & Teaching
- Clinical Leadership



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Why Advanced Practitioner Radiographers?

- Improved patient care
- Radiographers fundamental to the diagnostic pathway

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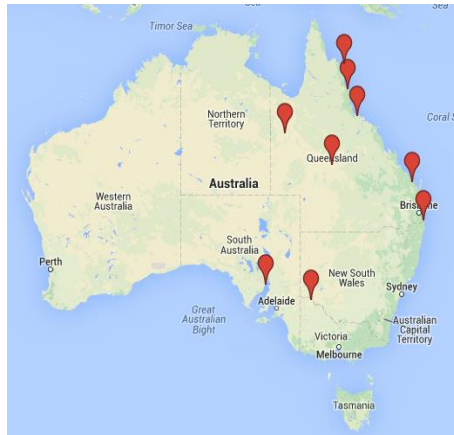


- First practitioner to see image
- Limited radiologist support
- Radiographer opinion



Evolution of Radiographer Image Interpretation

- Swinburne (1971) “pattern recognition” by trained radiographers
- Berman *et al.* (1985) “red dot” for MSK trauma
- Brealey *et al.* (2006) excellent accuracy; 81% sensitivity, 95% specificity for “red dot”



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- Radiographer advanced practice established in the UK
 - Opportunity (of a lifetime) to develop skills



Evidence Base – Skeletal Reporting

- Piper *et al.* (2005) Structured exam: 27 radiographers; ~2,700 X-rays; sensitivity 93%, specificity 92% and accuracy 93%
- Piper *et al.* (1999) Multisite clinical evaluation: 10 radiographers; 7,170 reports; accuracy 97% - 99%
- Brealey *et al.* (2005) Meta-analysis provided definitive evidence: 28,900 examinations; 92% sens 97% spec

- Radiographer advanced practice established in the UK
- Opportunity (of a lifetime) to develop skills
- Was this an advanced practitioner role?





-
- New role, new challenges
 - Established AP team: 4 reporting radiographers, 8 sonographers
 - Comprehensive service developed
 - Adult chest X-ray interpretation



Chest X-rays – Definitive Radiographer Reports

- Piper *et al.* (2014) Structured examination: 40 radiographers, 4,000 CXRs; 95% sensitivity & specificity, 89% agreement
- Woznitza *et al.* (2014) Clinical audit: 100 cases; 1 radiographer, 3 consultant radiologists; high concordance 92% (K = 0.83), 96% (K = 0.91), 96% (K = 0.91)



An Advanced Practitioner?

- Expert Practice ✓
- Leadership/Service Transformation
- Education ✓
- Service Evaluation/Research



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Justification of Medical Exposures

- Radiographers act as gatekeepers
- Legislation in UK regarding medical radiation exposures: IR(ME)R 2000
- Canada: Safety Code 35 (2008) & CAR Standards (2000)
- Referring clinician required to explain clinical benefit, detailed to enable exposure

Image Acquisition & Quality

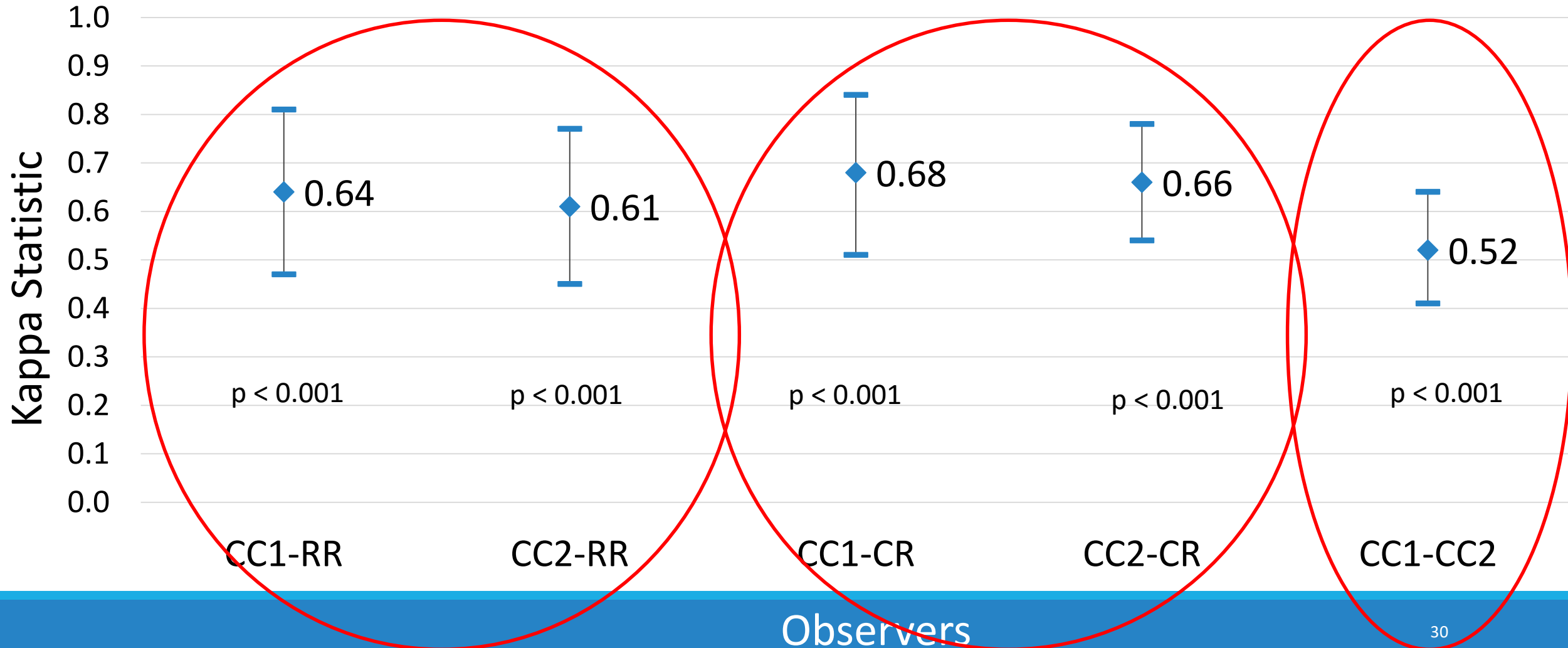
- Request queries
- Assist/mentor junior radiographers & assistant practitioners
- Initial interpretation
- Plain imaging queries & patient questions
- Lead quality audits



Chest X-rays – Agreement of Experts

- Random stratified sample of CXRs
- Two independent expert consultant chest radiologists, blinded to clinical report
- Reports compared for agreement: Kappa [K] and McNemar statistics
- 193 cases included; 79 (41%) normal clinical report

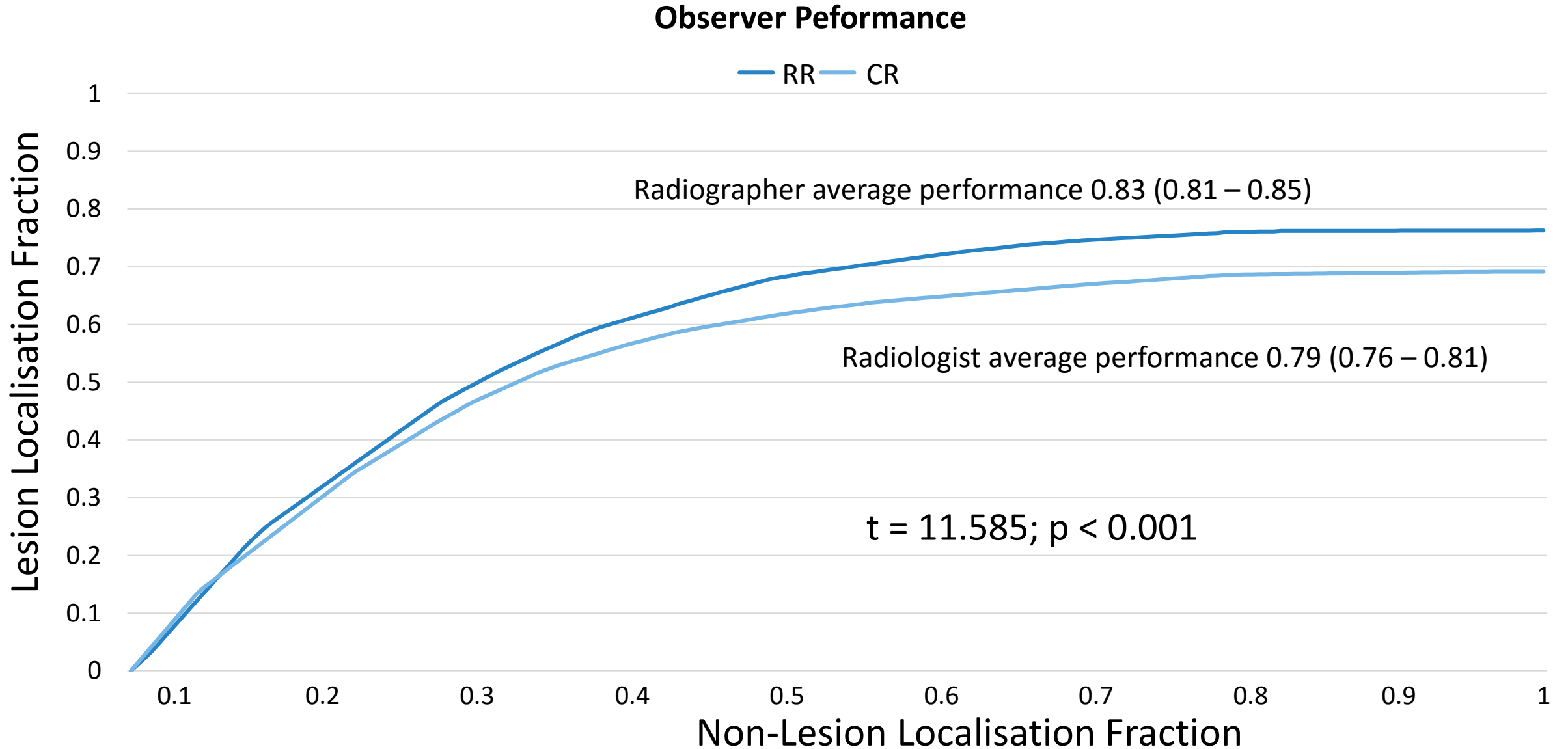
Observer Agreement: Kappa

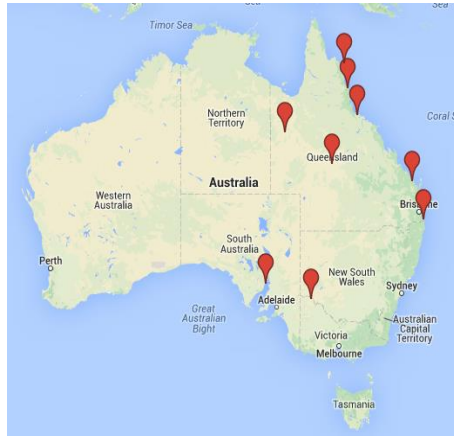


Diagnostic Accuracy – Adult Chest X-rays

- 10 consultant radiologists & 11 reporting radiographers
- 106 adult chest x-rays with robust reference standard diagnosis
- Normal reporting conditions
- Reporting radiographers must be comparable to consultant radiologists

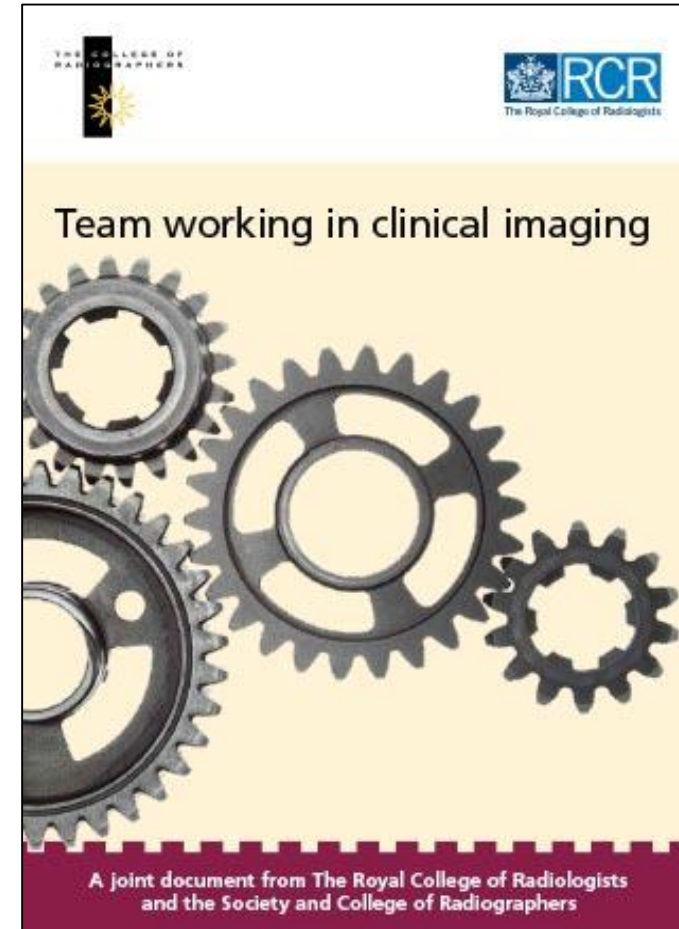
Diagnostic Accuracy – Figure of Merit





Contribution to Patient Care

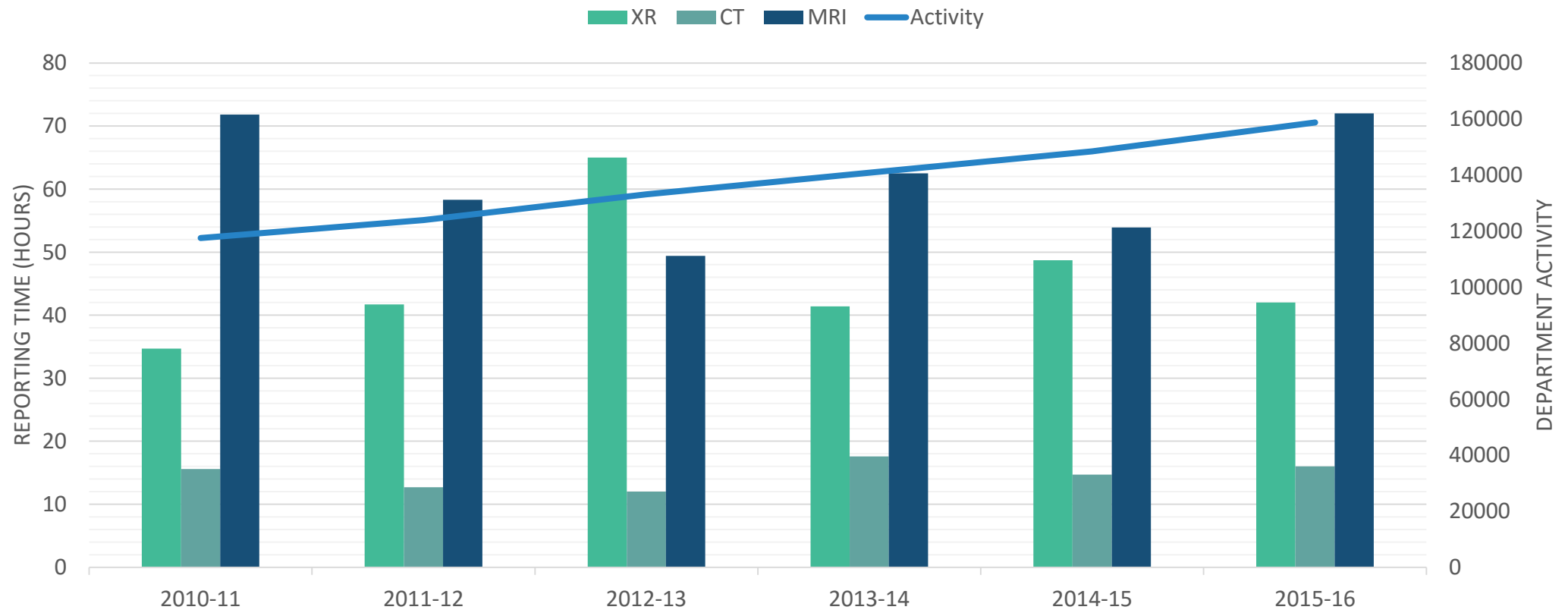
- Patient focused care
- Rapid rise in workload
- Political/economic climate



Contribution to Care: Service Evaluation

Woznitza *et al.* (2014) Service evaluation at single department

- Retrospective interrogation of Radiology Information System
 - Efficiency: Waiting Times, Radiographer Reports
 - Effectiveness: Report Turnaround Time, Discrepancies
- Re-audits in 2015 and 2016



Contribution of Advanced Practitioners

2013-14



**3 Consultant
Radiologists**

2014-15



**4.5 Consultant
Radiologists**

2015-16



**6 Consultant
Radiologists**

Contribution to Care: New Services

- Radiographer-led immediate ED skeletal reporting service
- Role for radiographer-led discharge?



Consultant Practitioner?

- Level 1 tertiary referral neonatal unit
 - 14,000 cot days per annum
 - ~3,000 x-rays annually
 - 2010: Not reported by radiology department
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- Implement radiographer-led plain imaging reporting service

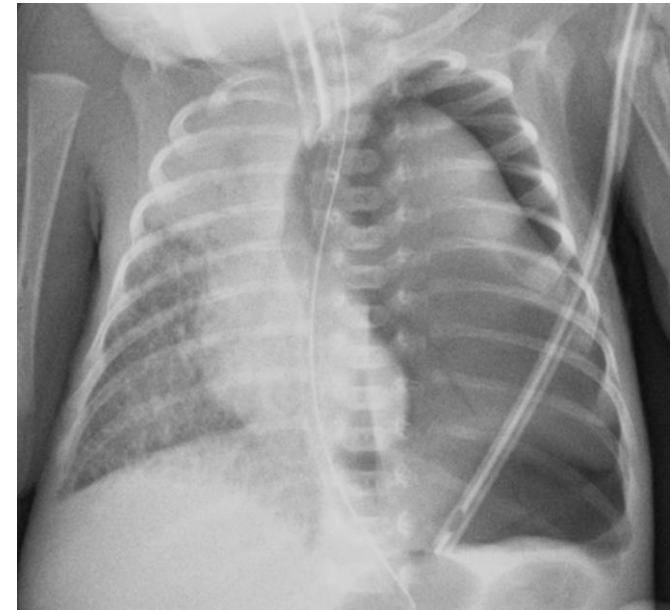


Response to Demand: Neonatal Reporting

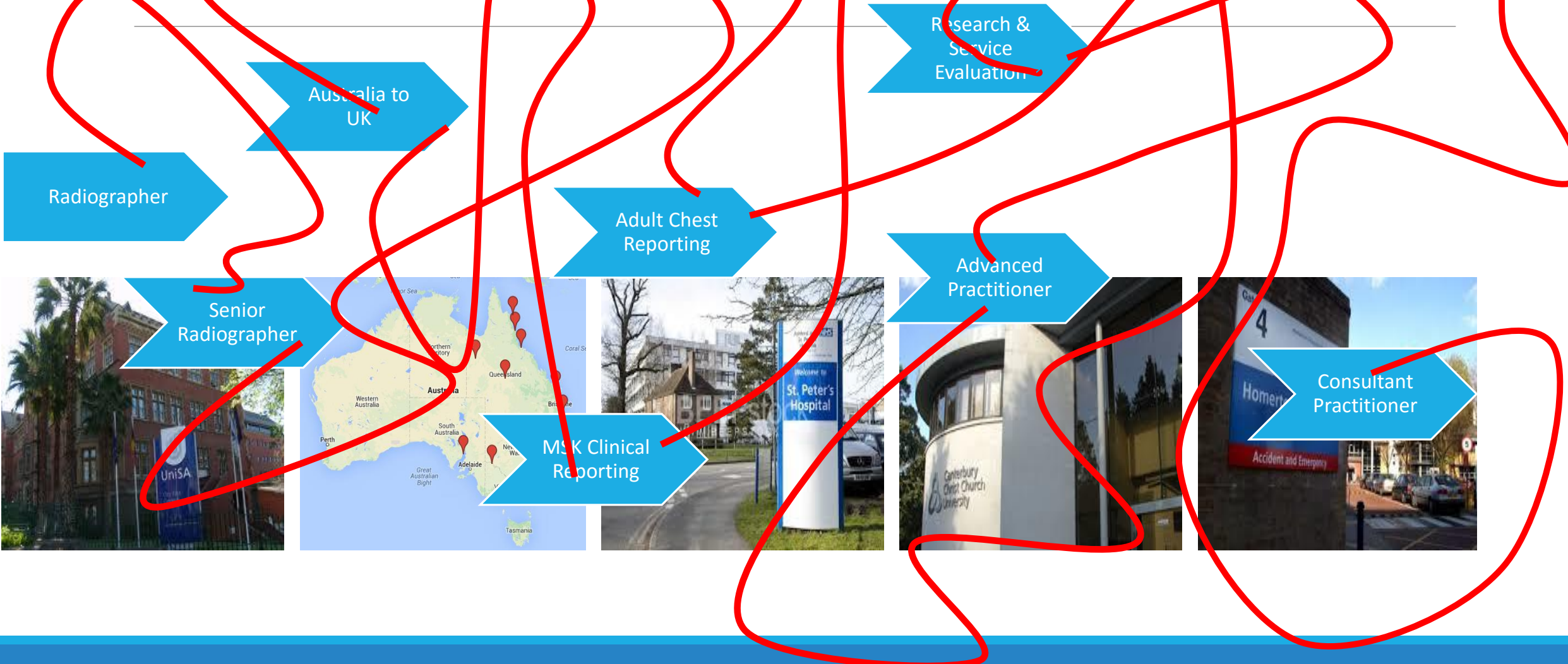
- Reporting radiographer interpreting skeletal and adult chest x-rays
- Bespoke, intensive training programme

Benefits?

- All x-rays reported, next working day
- 90% by radiographer
- Weekly MDT; radiographer deputises for consultant paediatric radiologist







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Challenges

- No defined pathway/characteristics
- Integration
- Communication
- What are the opportunities?

Where there is need!

Emergency Department

- CIHI (2012) ED capacity an issue; overcrowding, long waits, possibility of poor care
- Are you making best use of the MDT?
- Radiographer preliminary clinical evaluation
- Radiographer-led discharge?

Health Promotion: Lung Cancer

- Lung cancer has a significant impact on health
- Most common cause of cancer death
- Poor 5 year survival: Canada 17%; UK 10%

- Byrne *et al* (2014): 48 day wait from abnormal imaging to biopsy for lung cancer
 - role for AP rads to decrease waiting times?

Health Promotion: Lung Cancer

- Prevention: smoking cessation intervention
- Risk stratification: patient history & referral
- Early diagnosis: LDCT lung cancer screening

Conclusions

- Advanced radiographer practice improves patient care
- Growing evidence base for radiographer advanced practice, including clinical reporting
- Radiographer reporting contributes to patient focused radiology service

Conclusions

“professional guidelines could be changed as a result of popular pressure and published peer-reviewed audit/research”

Gibbs *Radiography* 2013;19:164

Questions?

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