

Is Low Dose Really Low Dose?

A Clinical Audit of Low Radiation Dose CT KUB Studies for Suspected Urinary Tract Calculi

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D., Winters, S.D, Olubaniyi, B.O.



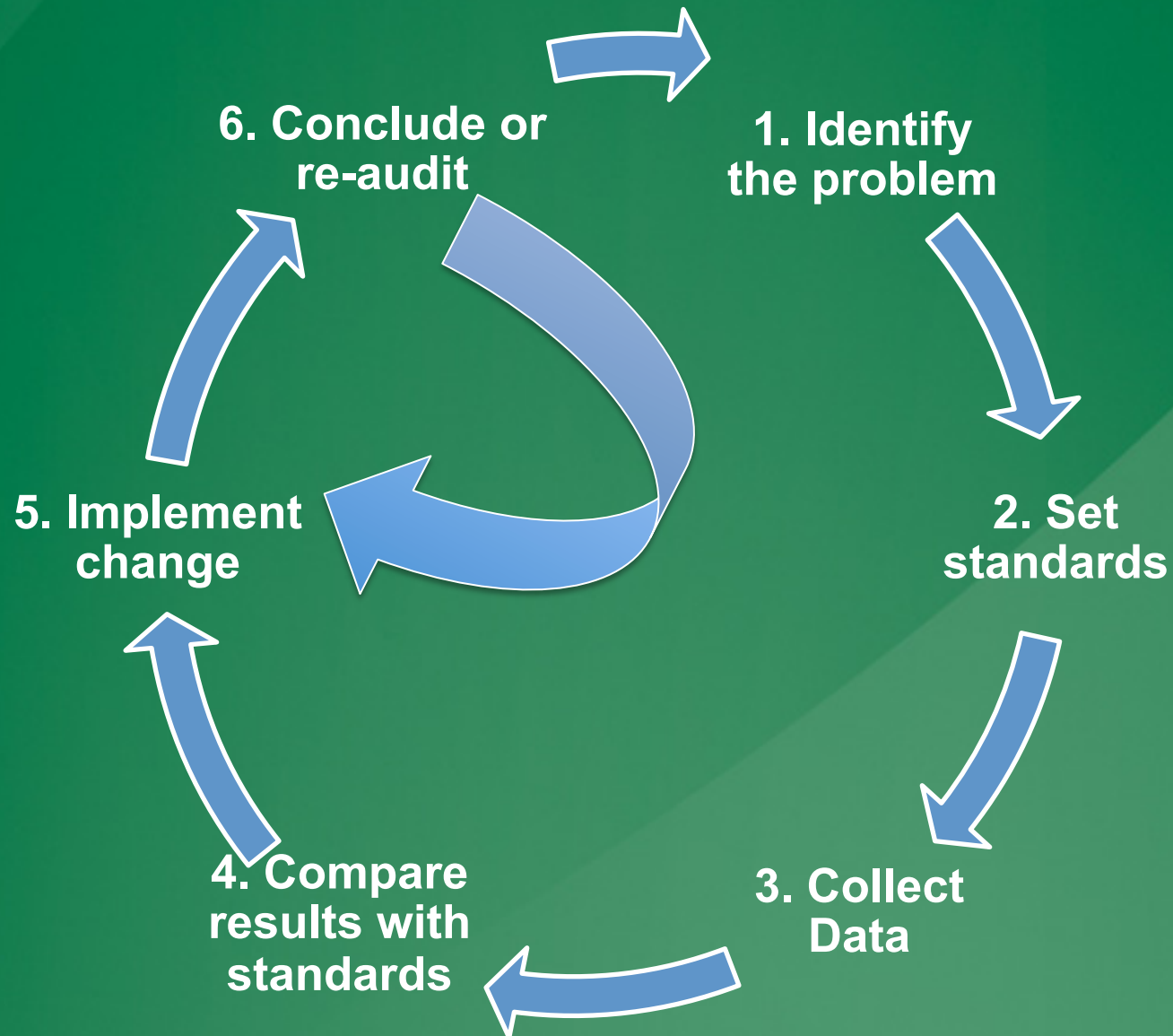
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Declaration of Conflict of Interest

- **Chahal, B.S.** - None
- **Kwan, A.L.C.** - None
- **Lambert, R.G.W.** – Consultant for Bioclinica
- **Nielsen, M.M.** - None
- **Gauvreau, D.** - None
- **Winters, S.D.** - Member of the Canadian Armed Forces, Department of National Defence
- **Olubaniyi, B.O** - None

The Audit Cycle



Identify the Problem



EPIISODES

RECIPES

TOPICS ▼

MORE ▼



The Dangers of Radiation Exposure, Pt. 1

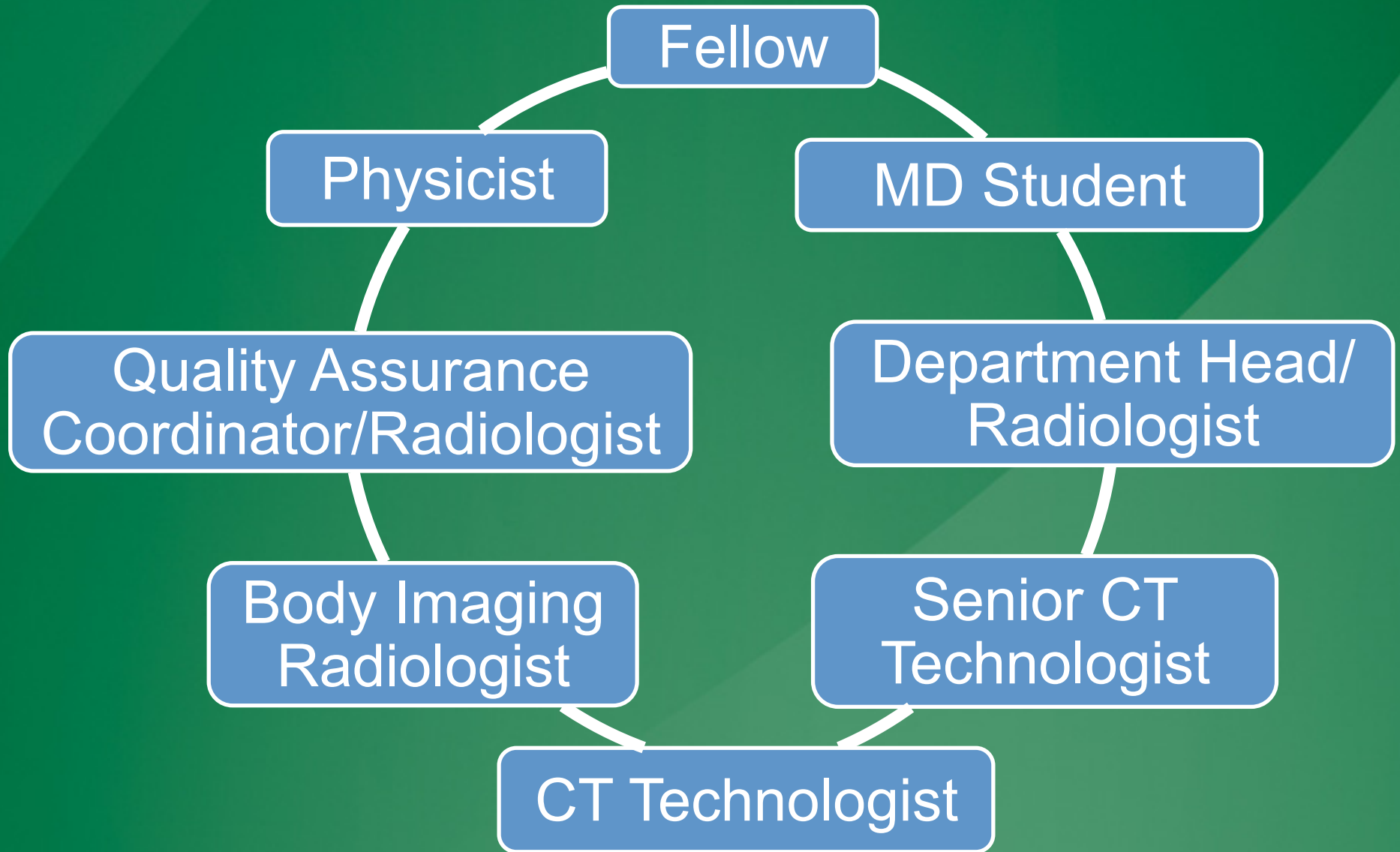
1. Lukasiewicz et al. Radiology, 2014 May; 271(2):445-451. According to experts, about half of the

Background

- CT KUB gold standard for investigating renal colic²
- High prevalence requiring repeated studies³
- Cumulative radiation dose can be high³



Audit Team



Set Standards

TARGET:

80% at ≤ 3 mSv⁴

We considered:

- A. Two targets
- B. 3 protocols based on BMI

Not realistic

Audit Results (1st cycle)

40 studies (from one machine)

3 mSv or less achieved in 6/40 15%

[Target: 3 mSv or less in 80%]

Target not met



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Implement Change

1. Change Noise Index from 33 to 40
2. Increase iterative reconstruction blend from 40% to 50% (ASIR)



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Re-Audit Results (2nd cycle)

39 studies

3 mSv or less achieved in 7/39 18%

[First cycle was 6/40 15%]

[Target: 3 mSv or less in 80%]

Target STILL not met



Implement Change...Again

1. Change Noise Index: 40 to 50
2. mA: 10 minimum - 300 maximum
3. Scan length:
 - ~~“Above the liver to lesser trochanter”~~
 - “1cm above the kidneys to 1 cm below the pubic symphysis”



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Re-Audit Results (3rd cycle)

37 Studies

3 mSv or less achieved in 15/37 41%

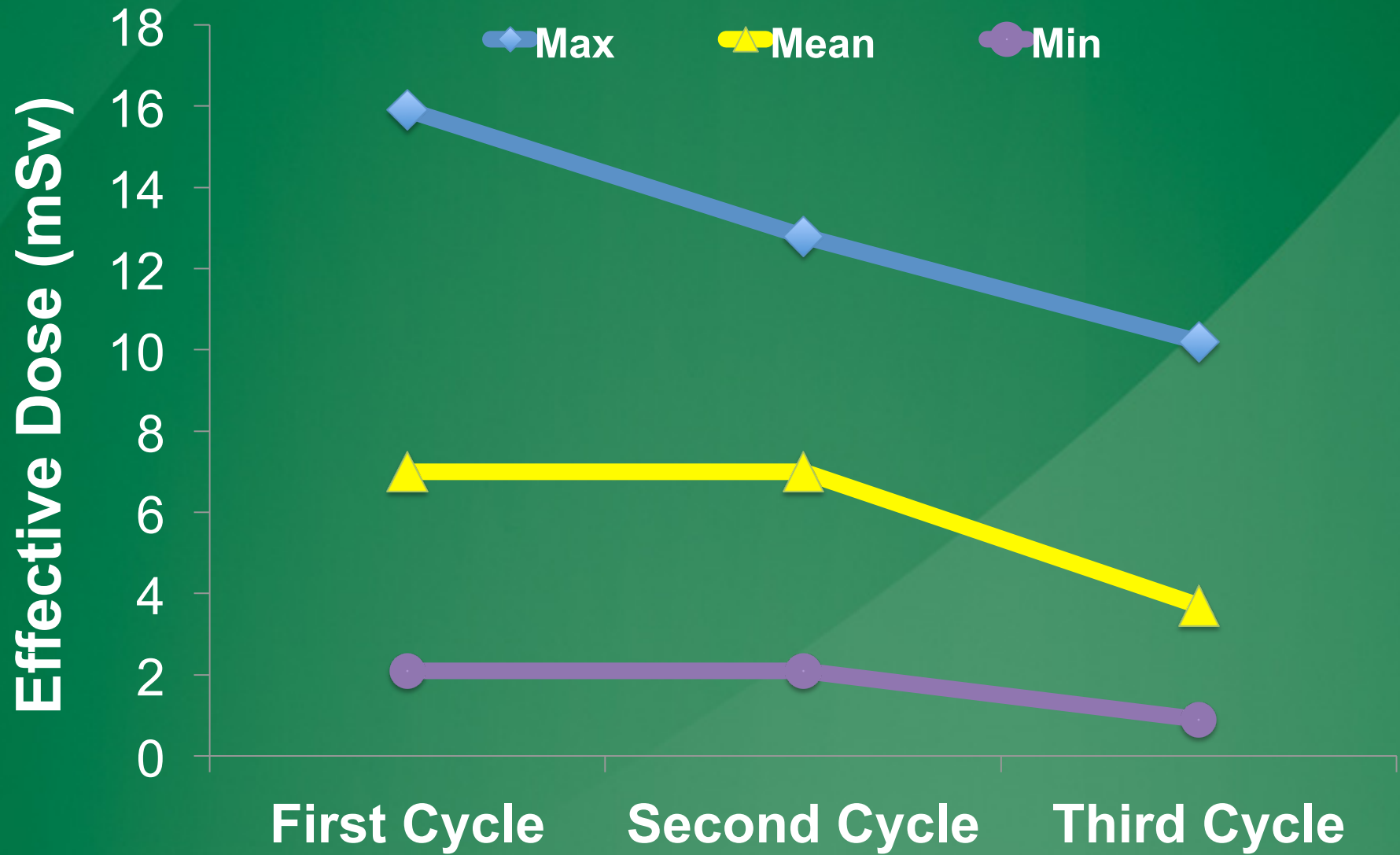
[Second cycle: 7/39 18%]

[First cycle: 6/40 15%]

[Target: 3 mSv or less in 80%]

Target STILL not met

Comparing Cycles





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Implementation Issues

1. Over scanning
2. Larger patients



Behavior Change

STRATEGY

EFFECTIVENESS

Emails



Word of mouth



Staff Meeting



Employee Engagement^{7,8}





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Audit Conclusion

- Target not met at first cycle
- Target not met after first intervention
- Target not met after second intervention
- Third intervention performed. Await fourth cycle.
- Further changes?



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Future Direction

Kaye Edmonton Clinic



UAH Scanners



Edmonton Hospitals



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Challenges/Limitations

1. Image quality
2. Dissemination of recommendations
3. Educating future technologists about local practice
4. Preventing overcorrections

