



Cardiac Conduction Abnormalities Following Thoracic Radiotherapy: A Systematic Review (EP08.04)

A. Stojanovic¹, K. Butterworth¹, T. Curtis¹, K. Banfill², A. McWilliam³, C. McCann⁴, G. Walls¹

¹Queen's University Belfast, Northern Ireland, ²Christie NHS Foundation Trust, Manchester, ³University of Manchester, Manchester, ⁴Belfast Health & Social Care Trust, Northern Ireland.



IASLC 2026 World Conference on Lung Cancer

SEPTEMBER 12 - 15, 2026
SEOUL, REPUBLIC OF KOREA

INTRODUCTION

Thoracic radiotherapy (RT) is associated with cardiac conduction abnormalities (1). ECG abnormalities may represent early or asymptomatic cardiac injury, ranging from repolarisation abnormalities to clinically significant arrhythmias.)

Following thoracic RT for lung cancer, symptomatic arrhythmias have been reported in up to 11% of patients (2).

Cardiac toxicity following thoracic RT is well recognised, however the effect on cardiac electrophysiology and conduction remains poorly characterised.

Aim

Conduct a systematic review of the incidence, spectrum and clinical significance of cardiac conduction abnormalities following thoracic RT.

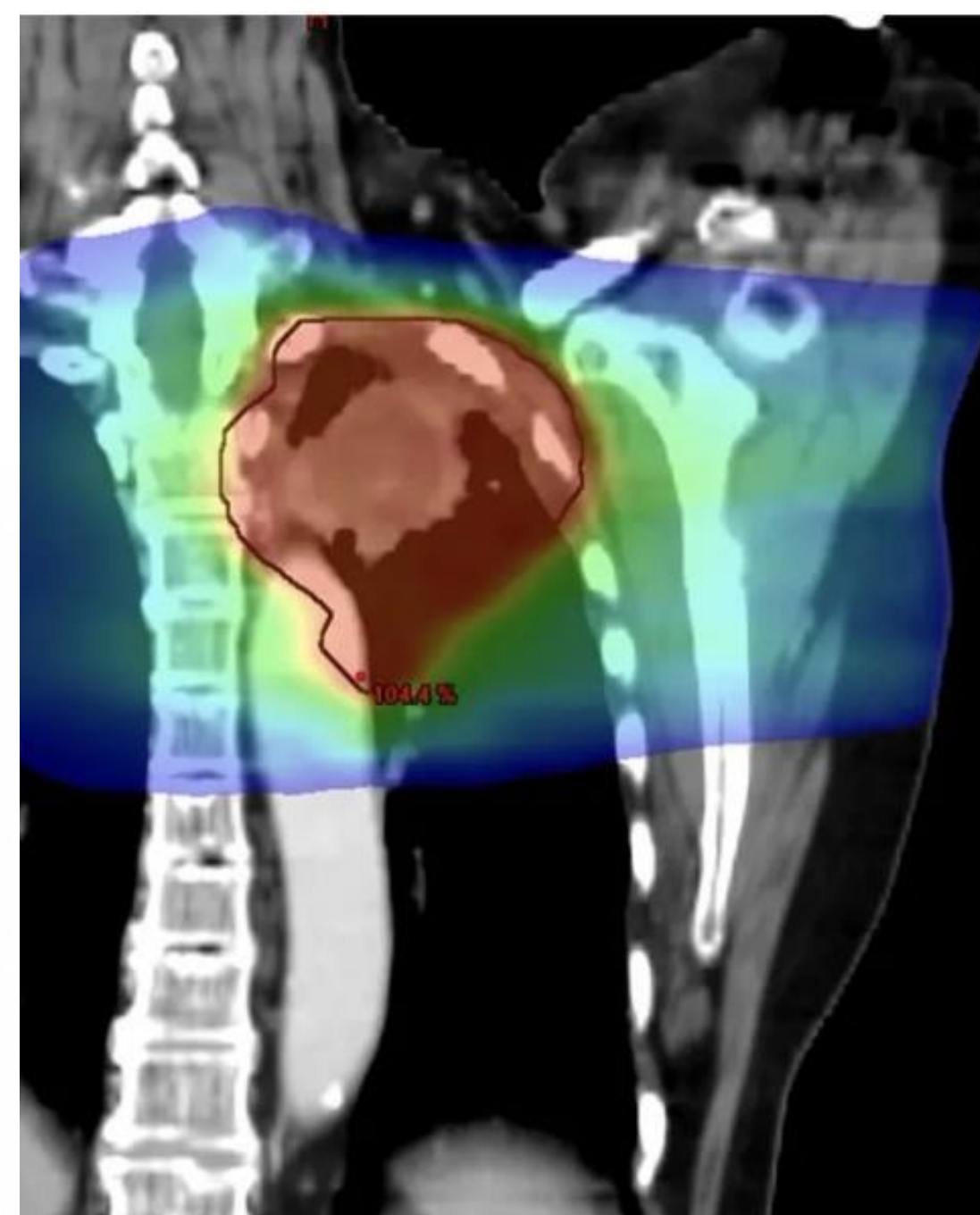


Figure 1: Coronal CT of RT treatment plan.

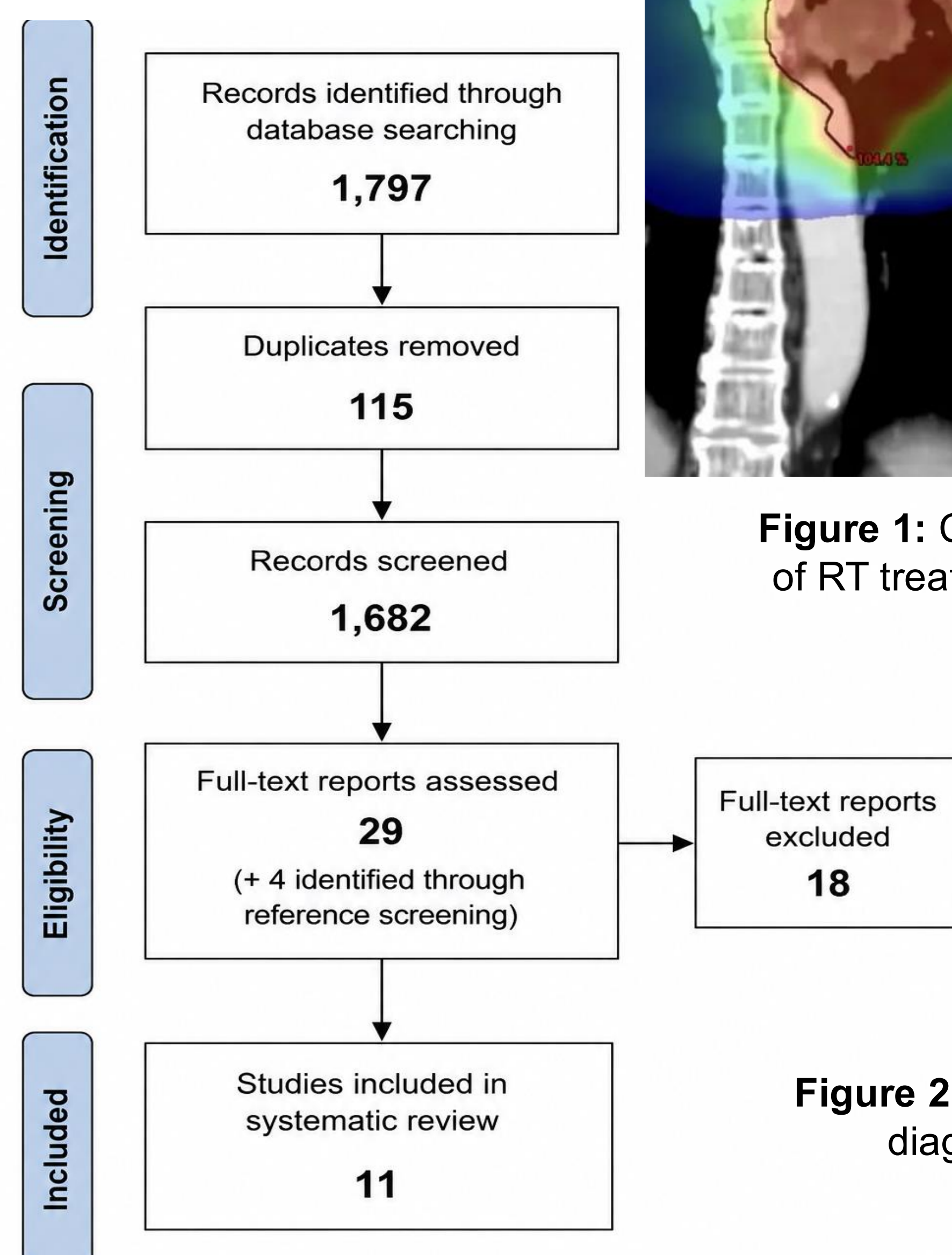


Figure 2: PRISMA diagram

METHODS

Systematic review in accordance with PRISMA guidelines. Protocol registered with PROSPERO (CRD420261295442). Details on conduction abnormalities including both waveform alterations (e.g. prolonged PR interval) and semantic patterns (e.g. T wave flattening) were extracted. Risk of bias was assessed using the Joanna Briggs Institute Case Series Checklist.

DISCUSSION AND CONCLUSION

Discussion

Cardiac conduction abnormalities are frequently reported following thoracic RT with the **greatest incidence observed in lung cancer**. QRS abnormalities are the most prominently reported ECG parameter.

Variation in study design, documentation of ECG abnormalities and a lack of ECG endpoints limits meaningful comparison between studies.

Concluding Messages

No study directly evaluated whether post RT conduction abnormalities predict subsequent arrhythmias.

Future Directions

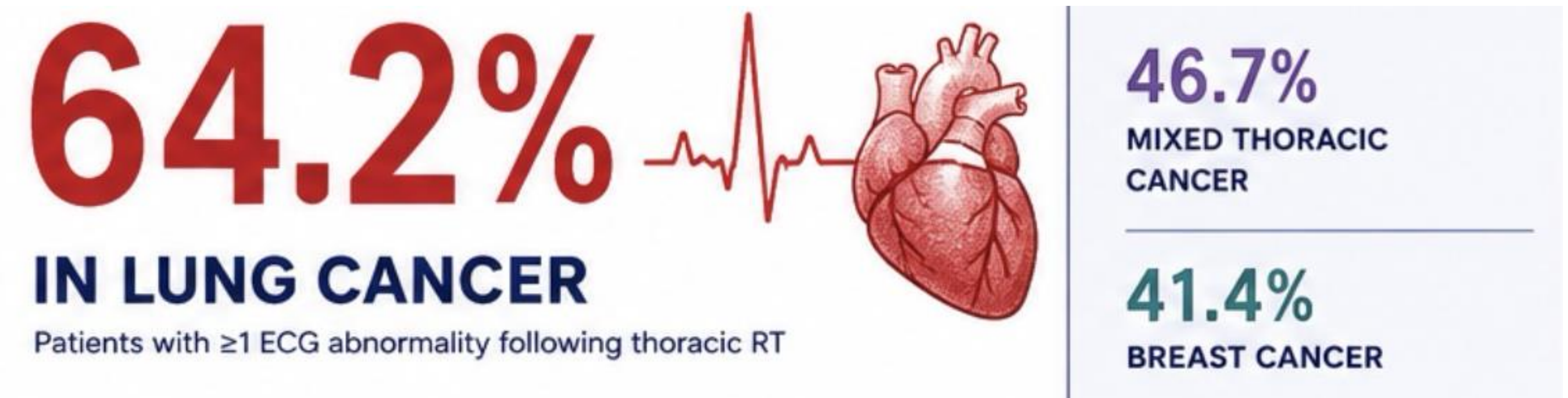
Prospective studies should use serial ECG assessment, baseline cardiovascular evaluation and detailed cardiac dosimetry, with long-term follow-up **linking ECG abnormalities to clinical cardiac outcomes**.

Identifying biomarkers that flag cardiac injury & post-RT cardiac monitoring via ECG analysis.

RESULTS

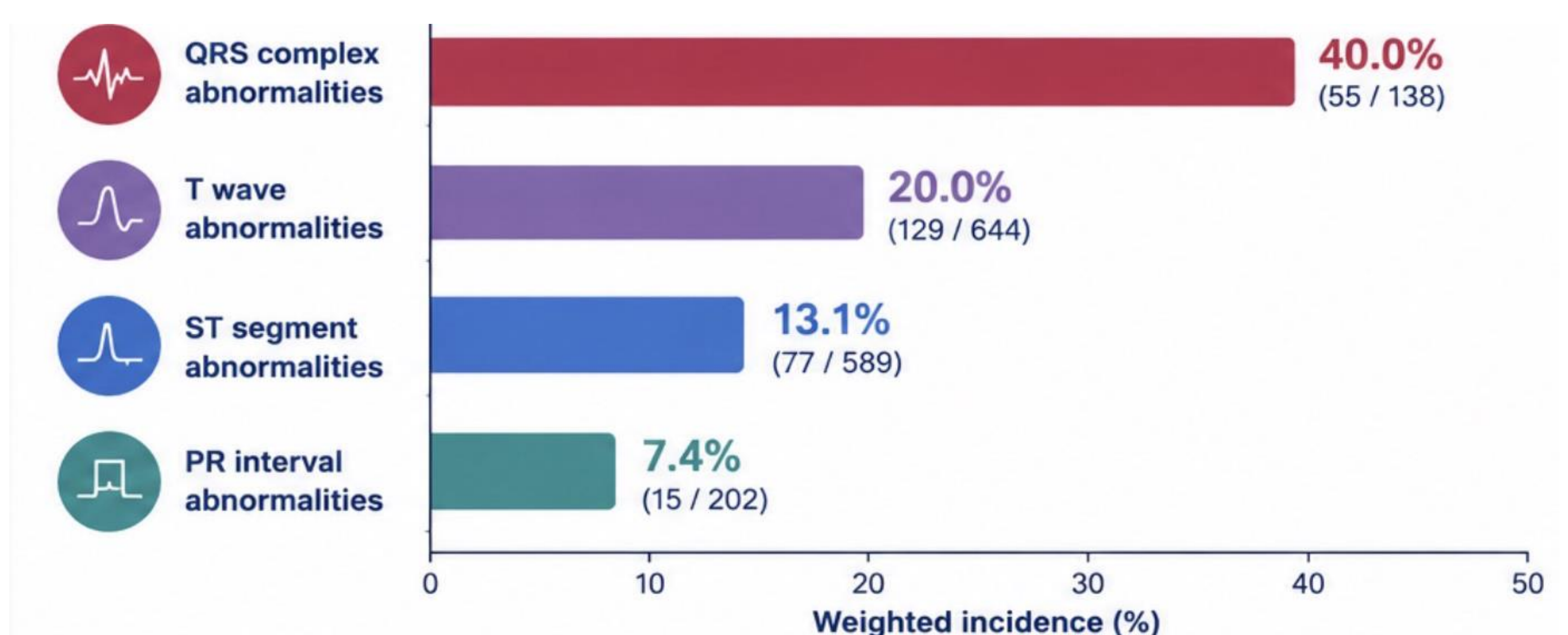
- ECGs were performed on 1,197 patients; 797 breast cancer, 208 lung cancer, and 227 mixed.
- Most patients received 3D-conformal radiotherapy (3D-CRT).
- Baseline cardiovascular health was available in 8/11 (72.2%) of studies.
- Baseline ECGs were conducted in 10/11 (90.9%) of studies.
- Patients in 9/11 (81.8%) of studies received concurrent or sequential chemo in addition to RT.
- In total, 78.4% (939) of patients received SACT and 21.6% (258) solely received RT.

WEIGHTED INCIDENCE OF ECG ABNORMALITIES



- Neither an average onset time nor a landmark time-point analysis of ECG abnormalities could be synthesised due to a lack of ECG monitoring protocol.
- There were insufficient cardiac substructure dose data available in the studies to analyse dosimetric correlations with arrhythmia.
- The mean JBI score was **8.1** (range 6-10).

SPECTRUM OF ECG ABNORMALITIES



The most frequently observed ECG abnormalities observed were QRS changes (40.0%). T wave abnormalities were mostly seen as T wave inversion (20.0%). PR interval abnormalities were the least common across studies (7.4%). ST segment abnormality was reported in 5/11 (45.5%) of studies. One study commented on clinical presentation of reported ECG abnormalities.

REFERENCES

- "Heart Substructure Radiation Dose and Cardiac Outcomes: Contemporary Evidence and Actionable Opportunities." JACC: CardioOncology, vol. 8, no. 3, June 2026, pp. 211-230, 10.1016/j.jacc.2026.04.009.
 - Walls GM, Bergom C, Mitchell JD, Rentschler SL, Hugo GD, Samson PP, et al. Cardiotoxicity following thoracic radiotherapy for lung cancer. British Journal of Cancer. 2024 Nov 6;.
- AI DISCLOSURE: ChatGPT was used to create and edit visual aids as seen on E-poster.