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Operator Radiation Exposure Comparing the Left-Radial Artery Approach and Right-Radial Artery Approach. The ORE-Study. A Systematic Review and Meta-analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 29 August 2025 and was last updated on 29 August 2025.

INTRODUCTION

Review question / Objective We seek to determine operator radiation exposure comparing left versus right radial artery approach.

Rationale The radial artery approach has become the predominant access site for percutaneous coronary procedures and has gained favor due to its safety profile and cost reductions. Most centers prefer the right-radial artery approach (RRA) due to historical laboratory configurations and ergonomics. However, a reduction in operator radiation exposure has been theorized for the left-radial artery approach (LRA) due to better shielding and more favorable subclavian artery anatomy.

Condition being studied Operator radiation exposure during cardiac catheterization.

METHODS

Search strategy Published trials comparing ORE from RRA and LRA were searched for within PubMed MEDLINE electronic database up to June 5th 2025. The following keywords in the MESH major topics category were used for the search: “left-radial artery, right-radial artery, and operator radiation exposure”. The following keywords in the MESH major topics category were used for the search: “left-radial artery, right-radial artery, and operator radiation exposure”.

Participant or population Participants are interventional cardiologist performing cardiac catheterization form either left or right radial artery approach.

Intervention Not applicable.

Comparator We are comparing operator radiation exposure using left radial vs right radial artery approach.

Study designs to be included 7 randomized and 3 prospective nonrandomized studies.

Eligibility criteria Studies were considered eligible if the following applied, they: (1) were randomized

controlled trials or prospective observational studies (case-control or cohort studies); (2) enrolled patients allocated to LRA or RRA and; (3) recorded ORE at an anatomical location(s) (thorax, left eye, right eye, neck, wrist, and abdomen) with dosimeters located outside lead garments.
Exclusion criteria were (1) anthropomorphic studies; (2) duplicate publication; (3) studies that were not peer reviewed; (4) did not report pre-specified endpoints of interest; and (5) studies that recorded aggregate ORE and not data on an individual case by case basis; (6) used standard lead shielding arrangements in their cardiac catheterization laboratories. No cohort data that included ORE with adjunctive radio-protection measures were used.

Information sources PubMed.

Main outcome(s) Operator radiation exposure, dose area product, fluoroscopy time, miligray and amount of contrast used.

Additional outcome(s) Baseline patient characteristics were also recorded including age, sex, height, weight, body mass index, body surface area, hypertension, diabetes, smoking status, hypercholesterolemia, and chronic kidney disease/nephropathy.

Data management Excel file.

Quality assessment / Risk of bias analysis Validity of studies were appraised according to the Jadad Scale or the Newcastle – Ottawa Quality Assessment Scale for Cohort Studies.

Strategy of data synthesis Stata software “meta” command for analyzing data for a meta-analysis.

Subgroup analysis A) only prospective observational studies and B) only clinical trials.

Sensitivity analysis N/A.

Language restriction Yes, we only included studies that were published in English.

Country(ies) involved United States of America.

Keywords left radial artery, right radial artery, operator radiation exposure.

Dissemination plans Submit to journal for publication.

Contributions of each author

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