EE202

Economic Evaluations of Imaging Guidance for Percutaneous Coronary Interventions: A Scoping Review

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BACKGROUND

- Intravascular imaging (IVI) - intravascular ultrasound (IVUS) and optical coherence tomography (OCT) - are used alongside angiography during percutaneous coronary intervention (PCI) to support accurate vessel sizing and optimal stent deployment.
- Recent guidelines upgraded IVI to a Class 1A recommendation for complex coronary lesions.
- However, IVI use varies across regions, with upfront costs and limited reimbursement cited as barriers.

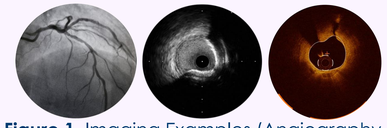


Figure 1. Imaging Examples (Angiography, IVUS, OCT)
Source: Boston Scientific, bostonscientific.com and Abbott Labs, cardiovascular.abbott.com. May 1, 2025

OBJECTIVE

This scoping review evaluated direct costs and cost-effectiveness of PCI guided with IVI plus angiography, compared with angiography guidance alone.

METHODS

- This study followed PRISMA-ScR guidelines.
- Partial economic analyses (e.g., cost analyses) and full economic evaluations (e.g., CEAs and CUAs) were identified.
- Monetary values were inflation-adjusted to 2023 USD.

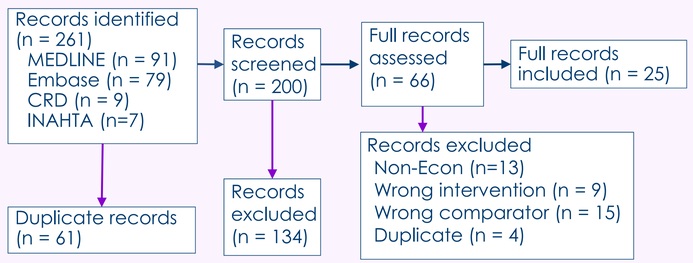


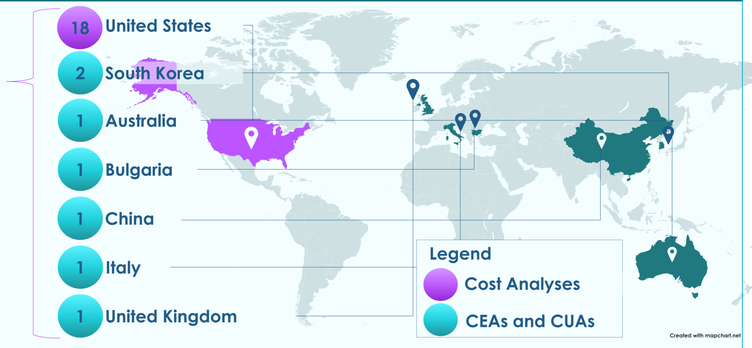
Figure 2. PRISMA Flow Chart

RESULTS

Figure 3. Map of studies by geographic perspective.

25 Studies
- 16 Articles (64%)
- 9 Abstracts (36%)

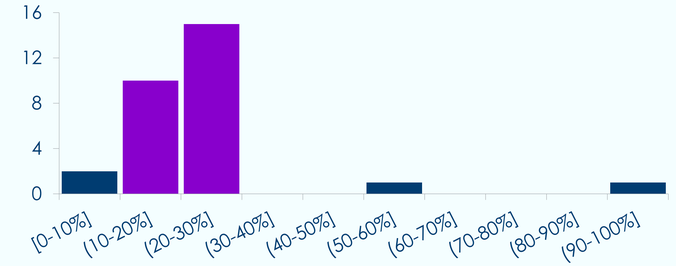
- 18 Cost Analyses (72%)
- 7 CEAs and CUAs (28%)



Cost Analyses: 18 studies (12 articles, 6 abstracts)

Figure 4. Distribution of IVI-Associated Cost Increases

- IVI-guided PCI increased direct hospital costs before discharge.
- Most reported a **10% – 30%** increase, corresponding to an additional **$3,000 – $9,000** USD per procedure.



CEAs and CUAs: 7 studies (4 articles, 3 abstracts)

Table 1. Full Economic Evaluations

- **4 of 7** identified IVI as a cost-saving **(dominant)** over a lifetime horizon.
- **3 of 7** reported ICERs between **$USD 6,535 - 22,775** per QALY, all within local WTP thresholds.

Country	Population	ΔCosts	ΔQALYs	ICER*
Australia	All PCI	($136)	0.11	Dominant
Bulgaria	STEMI & NSTEMI	ND	ND	Cost-effective STEMI: $12,282/QALY NSTEMI: $22,775/QALY
China	All PCI	ND	ND	Dominant
Korea	All PCI	ND	ND	Dominant
Korea	Complex PCI	($2,818)	0.36	Dominant
Italy	All PCI	($1,468)	0.22	Dominant
UK	STEMI & NSTEMI	$6,535	0.42	Cost-effective STEMI: $6,535/ QALY NSTEMI: $10,219/ QALY

*Results reflect: (1) Lifetime horizon (lifetime, ranges from 21-33 years) (2) IVUS effect persists for lifetime, except UK study assumed 1 year.

CONCLUSIONS

- Most U.S. partial economic evaluations reported 10-30% higher hospital costs associated with PCI guided with IVI and angiography compared with angiography alone.
- In non-U.S. settings, IVI-guided PCI demonstrated long-term cost-effectiveness despite higher initial costs.
- Four of seven full economic evaluations identified IVI as a cost-saving (dominant) strategy over a lifetime horizon. The remaining studies reported ICERs within widely accepted thresholds.
- Key drivers of economic value: reduced repeat revascularization, myocardial infarction, and mortality.
- Future research should assess the long-term economic value of IVI-guided PCI from a U.S. payer perspective.

LIMITATIONS

- All cost analyses were conducted in the U.S. and reflected a provider perspective.
- Inconsistent reporting of subgroup analyses limited the ability to fully map evidence across diverse clinical populations.

ACRONYMS

CEA: Cost-effectiveness analysis; CUA: Cost-utility analysis; ICER: Incremental cost-effectiveness ratio. IVI: Intravascular imaging. IVUS: intravascular ultrasound. ND: no data. NSTEMI: non-ST-segment elevation myocardial infarction. OCT: optical coherence tomography. QALY: Quality-adjusted life-years. STEMI: ST-segment elevation myocardial infarction. WTP: Willingness-to-pay.

DISCLOSURES

This study was supported by Boston Scientific. Susan Kayser and Schezn Lim are full-time employees of, and shareholders in, Boston Scientific. Amy Bolton was an intern at Boston Scientific at the time of this research.

References available upon request

Poster presented by **Susan Kayser (susan.kayser@bsci.com)** at ISPOR 2025, May 13-16, 2025 in Montreal