



Effective Health Care

Intravascular Diagnostic Procedures & Imaging Techniques vs. Angiography

Nomination Summary Document

Results of Topic Selection Process & Next Steps

- Intravascular diagnostic procedures and imaging techniques compared to angiography will go forward for refinement as a systematic review. The scope of this topic, including populations, interventions, comparators, and outcomes, will be further developed in the refinement phase.
- When key questions have been drafted, they will be posted on the AHRQ Web site and open for public comment. To sign up for notification when this and other Effective Health Care (EHC) Program topics are posted for public comment, please go to <http://effectivehealthcare.ahrq.gov/index.cfm/join-the-email-list1/>.

Topic Description

Nominator: Anonymous individual

Nomination Summary: The nominator is interested in the comparative effectiveness of strategies using intravascular diagnostic procedures compared to angiography alone for two distinct clinical questions:

1. In deciding whether percutaneous coronary intervention (PCI) is needed in patients being evaluated for coronary artery disease (CAD)
2. In guiding stent implantation during PCI in patients with CAD.

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Population(s):

- 1) Patients evaluated with coronary catheterization for CAD with:
 - a. Intermediate coronary stenoses (>40-50% and <70-80%)
 - b. Left main artery lesions
 - c. Non-ischemic coronary lesions that do not meet current criteria for PCI (e.g., non-stenotic lesions with features of plaque vulnerability) but may be considered for prophylactic interventions (e.g., prophylactic stenting for vulnerable plaques)
 - d. Coronary lesions that may require adjunctive (beyond stenting) percutaneous interventions (e.g., atherectomy, brachytherapy)
- 2) Patients undergoing PCI, with either bare metal or drug-eluting stents (BMS vs. DES) on either culprit or non-culprit lesions.

Intervention(s): Intravascular diagnostic procedures that evaluate morphological or physiological parameters of coronary lesions. These technologies will include: Fractional Flow Reserve (FFR), Coronary Flow Reserve (CFR), Intravascular Ultrasound (IVUS),

IVUS with virtual histology (VH-IVUS), Optical Coherence Tomography (OCT), Elastography, Near-Infrared Spectroscopy (NIRS), Thermography, Angioscopy, Intravascular magnetic resonance imaging (MRI), other.

Comparator(s): Conventional coronary angiography, with or without quantitative coronary angiography (QCA) or comparisons between index techniques, e.g., IVUS vs. angioscopy. Coronary angiography is the current standard of care for deciding need for PCI and for guiding stent implantation during PCI. Thus, coronary angiography is the comparator for both clinical questions.

Outcome(s):

- Cardiovascular events (mortality or myocardial infarction)
- In-Stent Restenosis (ISR) requiring Target Vessel Revascularization (TVR)
- Peri-procedural complications
- Stenting-related surrogate outcomes (ISR, Stent Thrombosis, malapposition, neointimal coverage)

Key Questions from Nominator:

1. For patients being evaluated for coronary artery disease, what is the comparative effectiveness of strategies using intravascular diagnostic procedures compared to angiography alone or other strategies in deciding whether a procedure is needed?
2. For patients having a stent implantation, what is the comparative effectiveness of using intravascular imaging techniques compared to angiography alone or other standard strategies in stent outcomes?

Considerations

- The topic meets all EHC Program selection criteria. (For more information, see <http://effectivehealthcare.ahrq.gov/index.cfm/submit-a-suggestion-for-research/how-are-research-topics-chosen/>.)
- Several adjunctive intravascular techniques have been developed to offer more detailed anatomic and functional information beyond conventional angiography for clinical decision making before and during percutaneous coronary intervention (PCI). The most commonly used techniques with a variety of applications are the intravascular ultrasound (IVUS) and the fractional flow reserve (FFR). No recent systematic reviews were identified that comprehensively examine the role of all possible intravascular techniques with a literature sample that mirrors contemporary treatment practices (e.g., drug-eluting stents). Clinical consultation on this topic indicates that there is emerging data on different techniques for evaluating patients with coronary artery disease and patients undergoing a PCI with either a bare metal stent or a drug-eluting stent. This literature includes studies that address the comparative effectiveness of imaging techniques. Therefore, a systematic review is both needed and feasible.