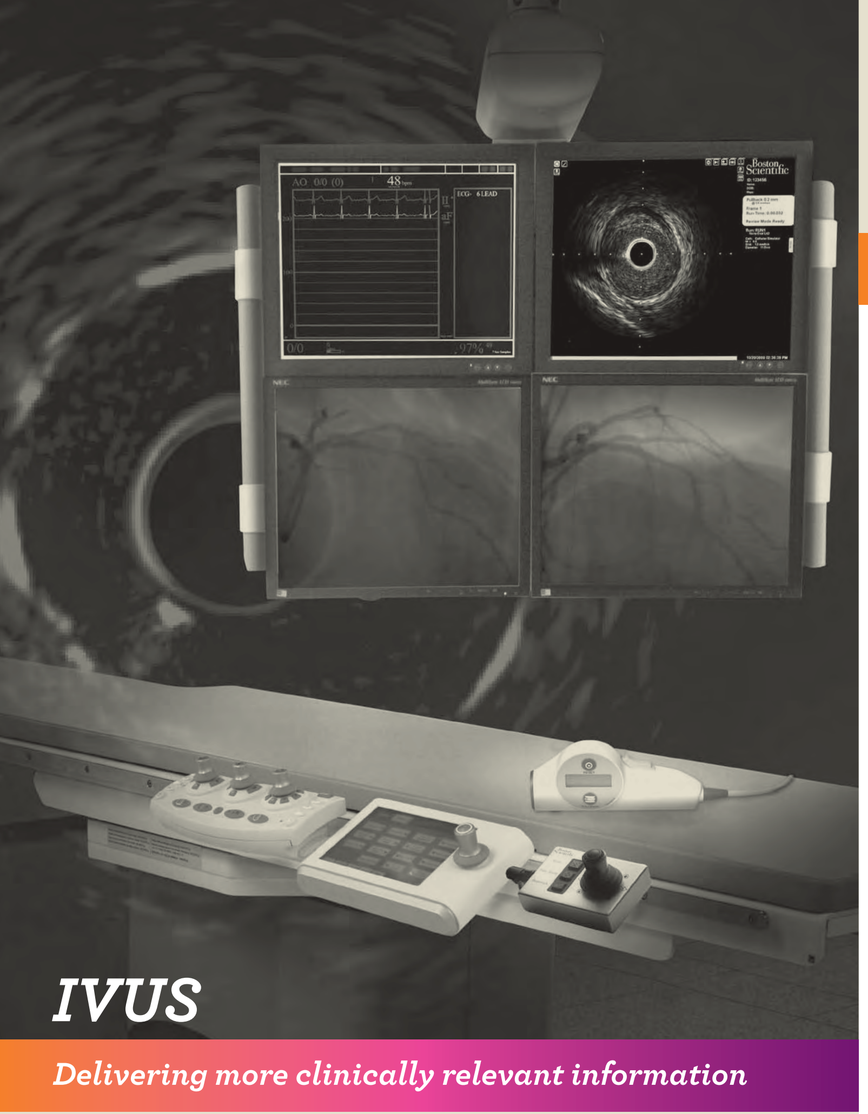


# IVUS

## Delivering more clinically relevant information

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*Fractional Flow Reserve, BSC Data on file

Results from case studies are not predictive of results in other cases. Results in other cases may vary.


1 Abizaid, Andrea et al, J AM Coll Cardial 1999; 34:707-715
2 Mintz, Intracoronary Ultrasound, 2005;122
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11 Mintz, Gary, TCT 2008, IVUS Use in the DES Era, Routine or Selective Use
12 Hermiller, James, MD, May 2008 Case Study



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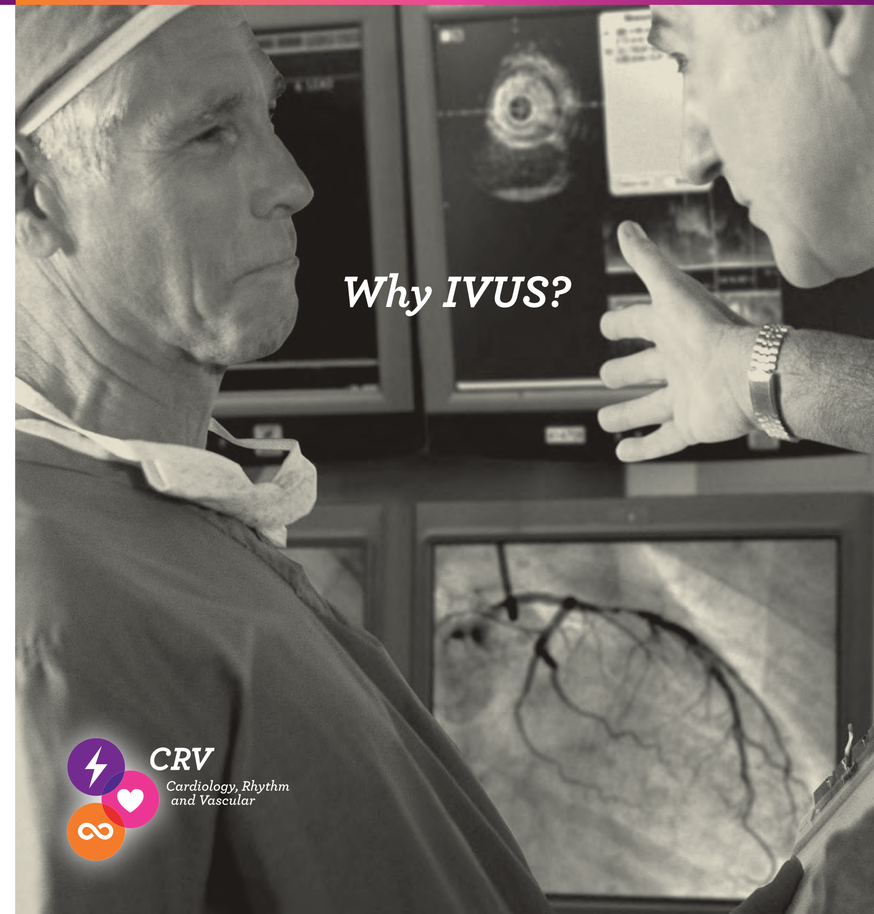


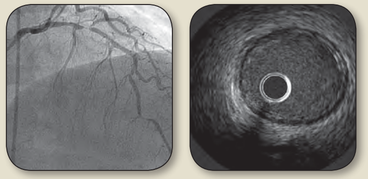
# IVUS
*Delivering more clinically relevant information*

# Reasons to Use IVUS

## IVUS as a Diagnostic Tool

Angiography provides a two-dimensional image whereas IVUS offers a three-dimensional detailed image with additional information that can:

- Evaluate lesion characteristics - calcification, fibrous, lipid/ necrotic core, mixed plaque, eccentricity, size, length
- Impact treatment choices, including:
  - Pre-dilatation
  - Plaque modification
  - Stent selection, size and length
  - Medical management
  - No treatment





Results from case studies are not predictive of results in other cases. Results in other cases may vary.

IVUS empowers you to treat the patient not the number.

*IVUS Gives You More*

| Measurement | FFR | IVUS |
|---|---|---|
| Lesion Significance | X | X |
| Stent Expansion | | X |
| Stent Placement | | X |
| Stent Apposition | | X |
| Stent Diameter Sizing | | X |
| Stent Length Sizing | | X |
| Plaque Burden | | X |
| Plaque Tissue Type | | X |
| % Stenosis | | X |
| Lesion Morphology | | X |

## Assessment of Left Main

IVUS can be beneficial during these angiographic challenges in the Left Main[1]:

- Aortic cusp opacification or streaming of contrast obscures the ostium
- Short length of vessel leaves little normal vessel for comparison
- Distal left main artery may be concealed by the branching of the left anterior descending and the left circumflex

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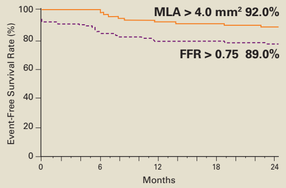
## Assessment of Lesion Significance

Comparing IVUS to FFR and based on studies with a clinical outcome, MLA less than 4.0mm$^2$ of a proximal epicardial artery is considered to be a flow-limiting stenosis.

**Event-free survival of patients with intermediate lesions and deferred procedures: Comparison of IVUS and physiologic studies[2]**

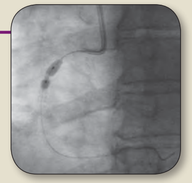



## Guidance for Plaque Modification

IVUS helps assess lesion characteristics that may impact treatment choices like[3]:

- Pre-dilatation
- Pre-dilatation with cutting balloon
- Rotablator™ Rotational Atherectomy System

Lesions which initially appear as either treatable with PTCA or by stenting may benefit from IVUS to help assess plaque morphology. Asymmetrical stent expansion occurs in up to 50% of lesions if plaque modification was not performed before stent deployment.[4]



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## Guidance for Stenting

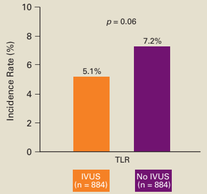
IVUS guidance, during stent procedures, is important due to geographic miss, stent apposition and expansion.

- S.T.L.L.R. Trial shows us that 67% of the time there is some kind of geographic miss when landing a stent.[5]
- Studies involving stent apposition show:
  - 44% lower TLR with complete stent apposition[6]
  - 78% of SATs involved incomplete stent apposition[7]
- The POSTIT Trial revealed that when using only the stent delivery balloon, over 70% of patients did not achieve optimal stent deployment[8]

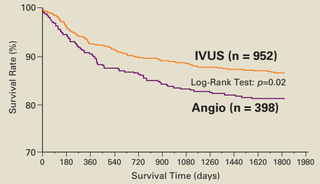
***IVUS is Clinically Relevant in DES***

Over 3100 patients studied comparing IVUS-guided DES implantation verses angiography alone showed the use of IVUS reduced the need for repeat procedures

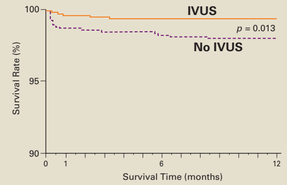
**Washington Hospital Center IVUS vs. No IVUS DES Study[9] 12-Month Clinical Results**




**Costantini IVUS vs. Angio Guided Stenting TVF Free Survival[10]**



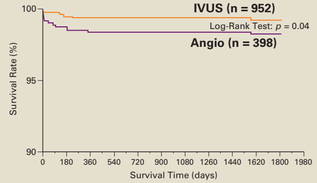

**Washington Hospital Center Stent Thrombosis Free Survival in IVUS and No IVUS Groups[9]**




## Influence on Stent Thrombosis

In two different studies, using IVUS during DES implantation has the potential to influence treatment strategy and affect DES thrombosis.

**Costantini IVUS vs. Angio Guided Stenting Thrombosis Free Survival[10]**




## Assessments of Complex Cases and Complications

IVUS may be beneficial during complex cases or evaluation of complications.

**High Risk Patient Subsets[11]:**

- Renal failure
- Limitations to dual antiplatelet therapy use
- Diabetes mellitus
- Poor left ventricular function

**High Risk Lesion Subsets[11]:**

- Bifurcations
- Ostial lesions
- Small vessels
- Long lesions
- Treatment of In-stent restenosis

**Complications[12]:**

- Dissections
- Hematomas

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