What nurses should know?

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IVUS is one of the advanced diagnostic tools used in Cath lab
Why do we need these Advanced techniques?

#For more and accurate ASSESSMENT

- Angiography demonstrates only a 2-dimensional view of coronary arteries and doesn't have the capability of providing information regarding vessel physiology.
- Lesions that appear to be similar may in fact look very different from across-sectional view and be have different from a physiologic standpoint.

More or Less

But No Details
**Definition**

(IVUS) Is a medical imaging methodology using a specially designed catheter with a miniaturized ultrasound probe attached to the distal end of the catheter. The proximal end of the catheter is attached to computerized ultrasound equipment.

* That allows physicians to acquire images of diseased vessels from inside the artery.

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**IVUS catheter**
**IVUS** provides detailed and accurate measurements of lumen and vessel size, plaque area and volume, and the location of key anatomical landmarks.

**IVUS Technology**

1-Virtual Histology (VH)

helps differentiate the four plaque types: **fibrous**, **fibro-fatty**, **necrotic core** and **dense calcium**.

<table>
<thead>
<tr>
<th>Plaque Type</th>
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<tbody>
<tr>
<td>Fibrous</td>
</tr>
<tr>
<td>Fibro-Fatty</td>
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<tr>
<td>Dense Calcium</td>
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<tr>
<td>Necrotic Core</td>
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2-Imaging – ChromaFlo
- ChromaFlo highlights blood motion in red
- ChromaFlo allows to find the true lumen and check stent full apposition

- Identifies red blood cell movement through the lumen
- Helps identify:
  * Lumen size
  * Stent apposition
  * Plaque involvement in bifurcations
  * Dissection
  * Thrombus
  * Plaque rupture
IVUS = Picture    Angio = Shadow

IVUS = All layers    Angio = Lumen

Intima
Media
Adventia

Lumen
**IVUS =** Cross & Long  
**Angio =** Long

**IVUS =** Measures  
**Angio =** Visual !?

Diseased To Healthy

Catheter To Artery
IVUS = Plaque Type  Angio = Lesion !?

VH  Virtual Histology
Dissection ??

IVUS = Sure

Angio = Sometimes !!

Flap

Medial dissection

Intimal dissection

Hazy

What to notice

Bifurcation

Main Branch

Side Branch
IVUS = Sure

Angio = Sometimes !!

Apposition ??

ChromaFlo™ identifies region of severe mal-apposition

ChromaFlo™ confirms and documents full apposition

Similar Angio Image, Different Result

Angio alone seems to highlight adequate flow and apposition

After post-dilatation with balloon (angiographic projection similar)
Nursing and technician role

1- Before
   - Preparing
   - Data entry

2- During
   - Measuring
   - Recording
   - Saving
   - Naming

3- After
   - Ending
   - Archiving

Indications of IVUS

- Accurate quantitation.
- Identify specific disease
  - left main stem, ostial lesions
- Identify plaque morphology
- Examine vessel when angiography is inconclusive
  - hazy lesions, presence or absence of thrombus or dissection
- Measure plaque load.
- Assessment of reference segment
  OR Measure true vessel size
**Indications cont...**

- Interventional strategy & device selection, provide important information (stent sizing, lesion length, presence of calcium, etc.)
- In-stent restenosis
- Recognition of any ambiguous appearance
- Optimal balloon angioplasty
- IVUS-guided stenting

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**Take Home Message**

**IVUS**

- IS one of the advanced techniques help in optimizing vascular intervention and management.
- Use Ultra Sound waves.
- Provide images with accepted resolution.
- Well defined layers.
- Precise measurements and stent apposition.
- Fair follow up image.