

GUIDING CATHETERS

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Why So Many Sizes & Shapes?

- Left or right coronary system
- No two anatomies are the same
 - Large or small patients
 - Small or enlarged aortas
 - Different vessel take off
 - Grafts



Considerations for Guide Selection

- Access approach
- Coronary anatomy
- Lesion morphology & location
- Device strategy



Source: Diagnostic and Therapeutic Cardiac Catheterization, Grossman's Cardiac Catheterization, Angiography, and Intervention



Diagnostic vs Guide Catheter

Diagnostic Catheter	Guiding Catheter
Engage Coronary Arteries	Conduit for device & Wire
Pressure Assessment	Support of equipment
Coronary Angiography	Injection of Contrast
	Pressure measurements
	Angiographic Assessment



Guide catheters Compatibility with devices and techniques		
Catheter Size	Devices	Techniques
5 Fr	Balloons \leq 5 mm Stents \leq 4.5 mm IVUS Rotablator 1.25 mm	No Kissing Balloon
6 Fr	All Coronary balloons All Coronary stents Cutting Balloon Rotablator \leq 1.5 mm CSI orbital atherectomy 1.25 mm Protection device Guideliner	Kissing Balloon
7 Fr	JoStent® Rotablator 1.75 mm Guideliner Trapping balloons	Simultaneous Kissing Stent
8 Fr	Rotablator 2 mm Guideliner Trapping balloons	Trifurcation stenting

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Guide Catheters		
	6 Fr	7-8 Fr
PROS	<ul style="list-style-type: none"> • Smaller puncture • Small vessel access • Brachial / radial access • Deeper engagement (minimal dampening) 	<ul style="list-style-type: none"> • Increased support • Improved visualisation • Increased torque • Facilitates the use of 2 balloons (kissing) • Allows the use of any converted stents
CONS	<ul style="list-style-type: none"> • \searrow support • \searrow visualisation • \searrow torque • Device limiting (> 0.71" risk of kinking) 	<ul style="list-style-type: none"> • Larger puncture site / recovery time • Pressure dampening • Increased contrast usage

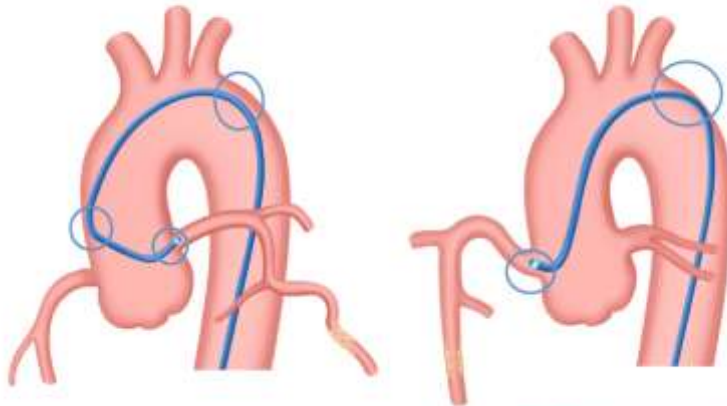
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Guide catheter selection : Key considerations

- Radial vs. femoral approach
- Anticipated degree of support vs. needed I.D. vs. both
- Aortic anatomic considerations
 - Diameter of ascending aorta (small, NL, dilated)
 - Tortuosity of aorta & iliofemoral system impacting catheter length and handling
- Target vessel considerations
 - Size of TV ostium and presence of disease
 - Target segment for PCI (ostial vs. proximal-distal?)
 - Takeoff location (NL/ant/post) vs SOV
 - Takeoff angle (NL vs. high/low)
- Strategy for engagement & support
 - Coaxial vs. non-coaxial positioning vs. deep intubation
 - Support from ipsilateral SOV vs. backup
- Specific interactions between device and guide curve (esp. atherectomy)



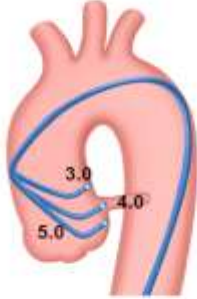
Backup Support



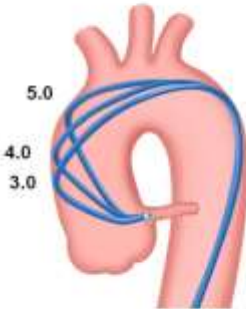
Source: [Diagnostic and Therapeutic Cardiac Catheterization, Grossman's Cardiac Catheterization, Angiography, and Intervention](#)



Curve / Tip Length




Tip Orientation

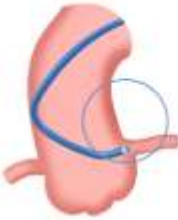


Lateral Wall Support

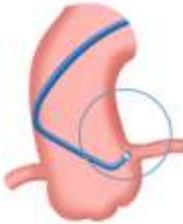
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Coaxial Alignment




Coaxial

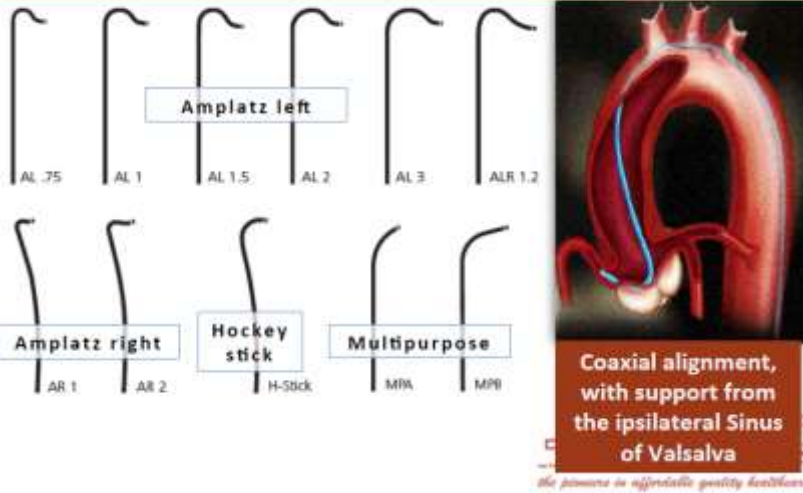


Non-Coaxial

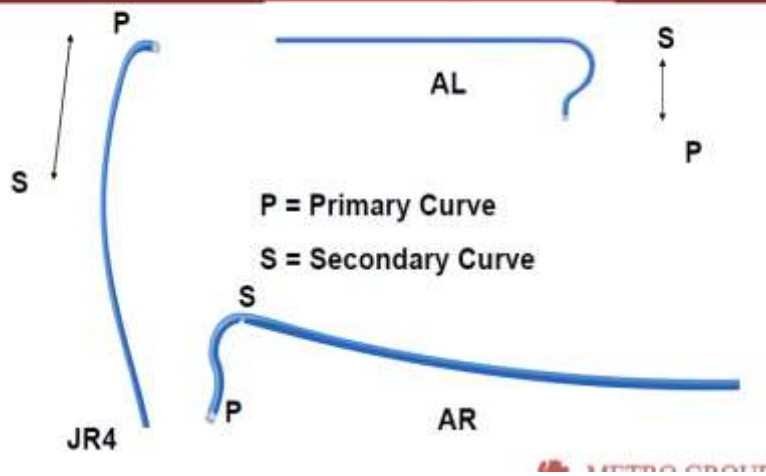
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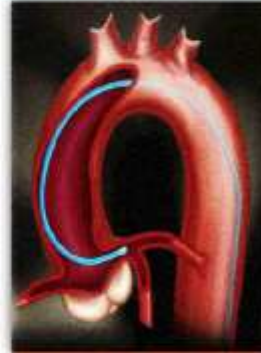
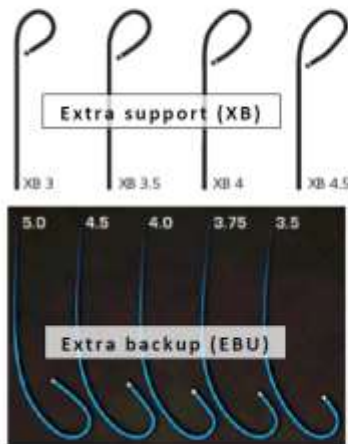
Common guide shapes for extra support from the Sinus of Valsalva



Curve Length



Common guide shapes for power support from contralateral aortic wall

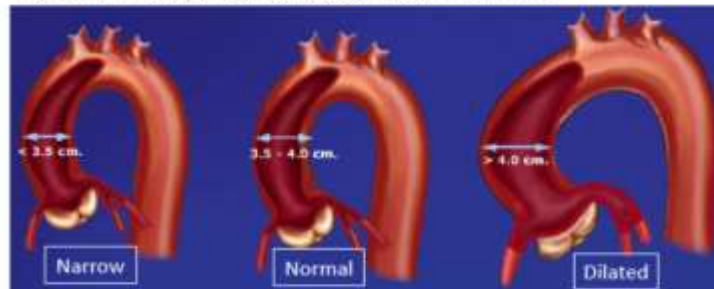


Coaxial alignment,
with power support
from the opposite
wall of the aorta

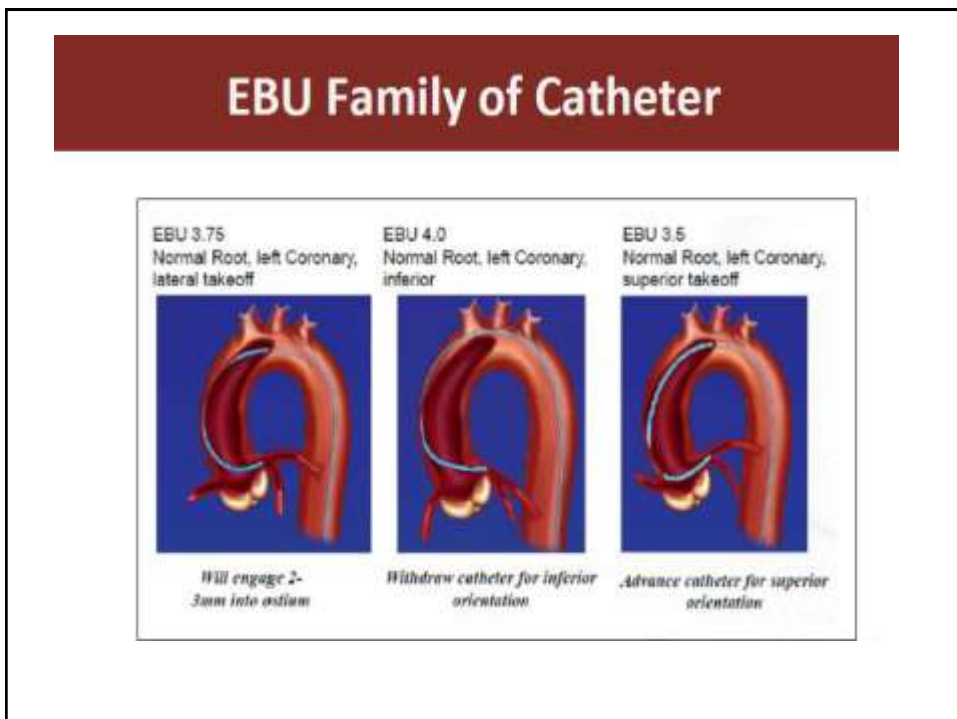
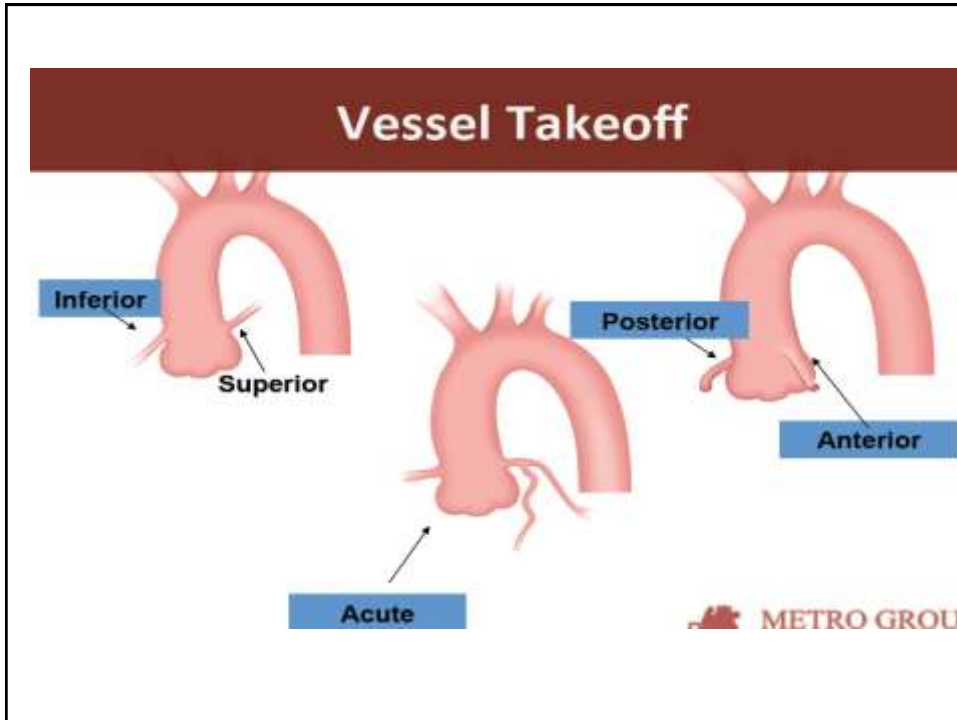
COUP
ALS

Catheter Choice based on Anatomy

- How does the operator choose or know the width?



- Normal aorta has curve/diameter of 3.5cm-4.0cm. Found in 60-70% of all patients
- Narrow aorta has tight curve and smaller diameter (<math>< 3.5 \text{ cm}</math>). Softer guides can compensate for tight curve in arch
- Dilated aorta is at more relaxed angle and diameter is $> 4.0 \text{ cm}$



Catheter Engagement

and engages well in
RCA grafts, which
often have an inferior
takeoff.

RCB

HO guides are often
used in right grafts,
offering good backup
support.

Hockey Stick II

inferior takeoffs of
right grafts.

Judkins Right

HO II is ideal for
force, as the primary
curve has a superior
takeoff.

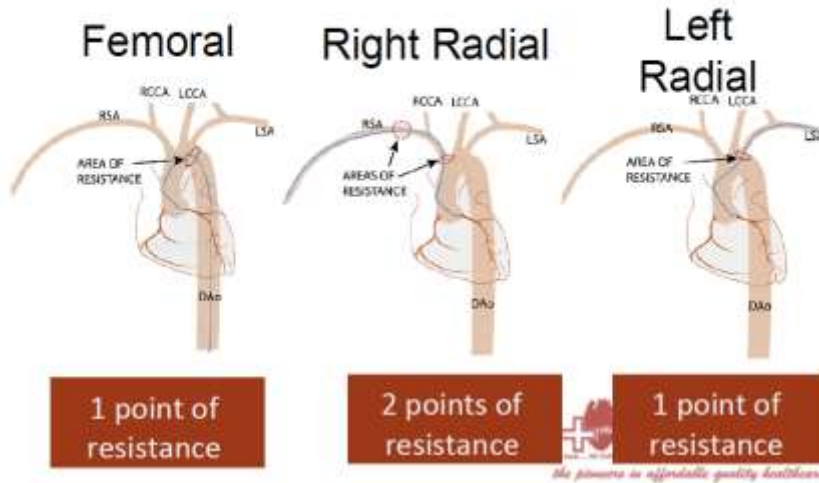
Hockey Stick II

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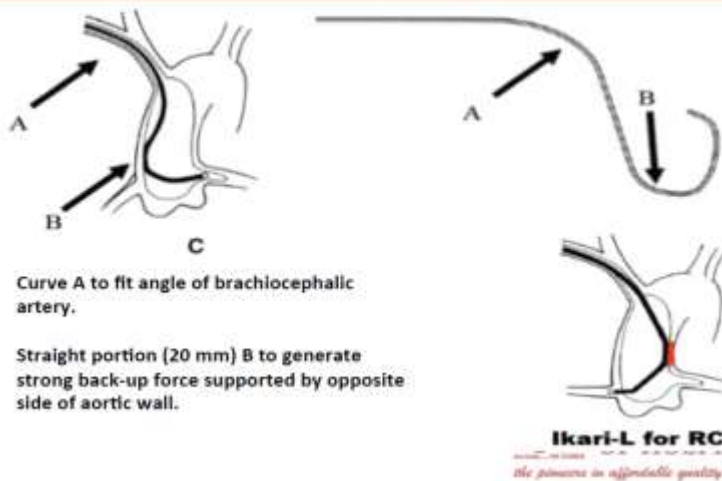
Radial Access Catheters

- Kimny
- Long Tip
- Judkins
- Hockey Stick
- Multipurpose

Catheter course: Radial vs. femoral



Universal radial guide catheters Catheter manipulation from right radial approach



Universal vs. Judkins catheters?

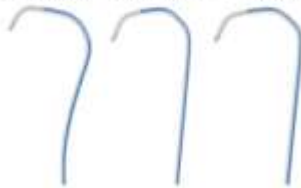
Advantages

- Single pass through radial artery = potentially less time and less spasm

Disadvantages

- Cost
- Learning curve
- Potentially more catheter manipulation

Ultimate 1 Ultimate 2 Ultimate 3



Advantages

- Cost
- Familiarity / availability

Disadvantages

- More time
- More passes through radial artery potentially = more spasm

Performa JL4 JR4 pigtail MIV pigtail



Catheter selection: Key considerations

The Basics

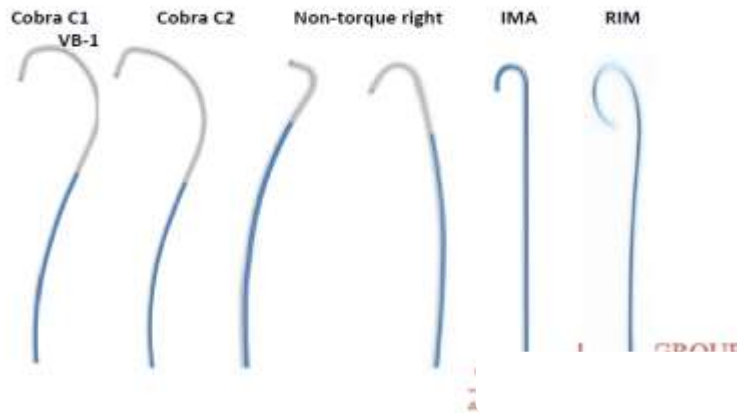
- Standard size – JL4.0 for access from left arm
- Size down ½ size for access from the right arm (+/- left arm)
- Finger torque technique
 - Small torquing movements (clockwise and counterclockwise).
 - Fingertip technique is recommended (as opposed to the wrist technique)
- Standard guide catheter shapes work very well in the radial approach
 - JL4.0, JL3.5, JR4, JR5, EBU3.5, MAC

Catheter selection: Key considerations

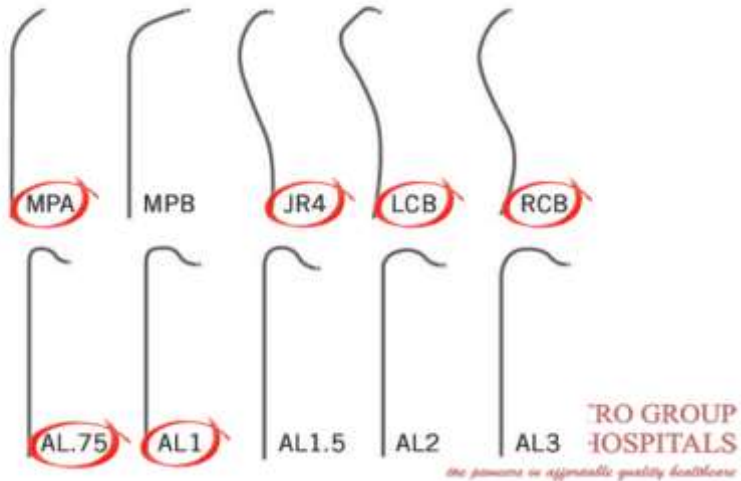
- High probability of FFR, IVUS/OCT, PCI: Consider **starting with a universal guiding catheter**
- In the event of a small radial artery / spasm, it's best to use **4-5 Fr and minimize number of passes** through the arm
- High probability of subclavian tortuosity / distortion (advanced age, PAD, aortic dilatation/aneurysm, thoracic anomalies such as scoliosis, pneumonectomy, etc.) usually favors **L radial approach** with appropriate catheter selections
- Large pannus, inability to bring in / slightly pronate L arm usually favors **R radial approach** with appropriate catheter selections

METRO GROUP

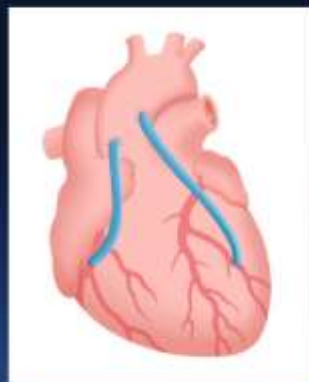
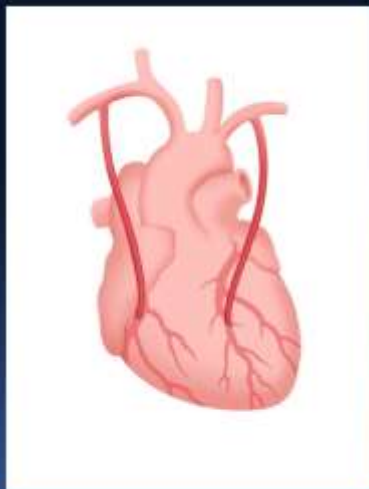
Other catheters worth knowing



Engaging bypass grafts from the wrist



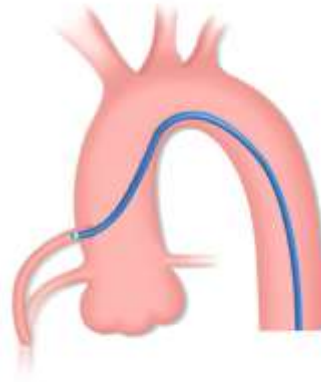
Graft Cannulation



Saphenous Vein Grafts

Saphenous Vein Grafts Catheter Selection

- Bypass Right (BPR)
- Bypass Left (BPL)
- Amplatz Left (AL)
- Amplatz Right (AR)
- Hockey Stick (HS)



Source: The Manual of Interventional Cardiology



Summary & Conclusions

- Guide catheter selection is key to procedure success
- Catheter construction and design offer important benefits
- Guide catheter selection depends on access approach, anatomy, lesion location and morphology



