Making the Most Out of My Guidewire:

**Guidewire Selection**

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Disclosure

Speaker name: Brian G. DeRubertis, MD

I have the following potential conflicts of interest to report:

- Consulting: *Abbott Vascular, Medtronic, Cook, Boston Scientific*
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

☐ I do not have any potential conflict of interest
Guidewire Selection

**Guidewire Basics**

Requirements of a Guide Wire:

- Reach treatment area
- Access lesions
- Cross lesions
- Facilitate delivery of interventional devices
Guidewire Selection

**Guidewire Basics**

Performance Properties of Different Wires:

- **Steerability** – ability to maneuver wire through the anatomy (similar to torquability)
- **Trackability/Deliverability** – How effectively the wire follows itself through the anatomy to reach the lesion
- **Crossability** – ability to cross through lesions
Guidewire Selection

Guidewire Basics

Performance Properties of Different Wires:

- **Pushability** – How efficiently/effectively a force applied to the proximal portion of the wire is transferred to the distal tip of the wire
- **Durability** – ability of the wire to maintain its original shape after repeated use
- **Visibility** – The ability to be seen under fluoroscopy
- **Tactile Feedback** – how well the engagement of the tip or distal end of the wire is felt by the operator
Guidewire Selection

Guidewire Basics

The Six Key Components of Guide Wires

- Core Diameter
- Core Material
- Core Taper/Grind
- Coils & Covers
- Coatings
- Tip Style

The “Building Blocks” of all Guide Wires

These building blocks combine to provide a wire with its technical attributes, and these technical attributes result in the wire’s performance properties. Wires with different performance properties can achieve different goals.
Guidewire Selection

Guidewire Basics

Each component affects a technical attribute and each attribute in turn has an impact on performance properties of the wire.

Components
- Core diameter
- Core taper/grind
- Core material
- Tip style
- Coils & covers
- Coatings

Technical Attributes
- Support ↔ Flexibility
- Torque Response
- Lubricity
- Radiopacity
- Force Transmission

Performance Properties
- Steerability
- Trackability
- Pushability
- Crossability
- Visibility
- Durability
- Tactile Feedback

Reach the lesion, cross the lesion, and deliver the treatment device.
Guidewire Selection

Guidewire Basics

2 General Wire Categories

Workhorse

Access wire
“Go-to” wires

Specialty

Soft tip atraumatic wires
CTO wires
Device delivery wires
# Guidewire Selection

## Guidewire Basics

<table>
<thead>
<tr>
<th>Workhorse Wire</th>
<th>Specialty Wire</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Properties:</strong></td>
<td><strong>Uses:</strong></td>
</tr>
<tr>
<td>• Versatile</td>
<td>• Limited specific use</td>
</tr>
<tr>
<td>• Maneuverable</td>
<td>• CTO crossing</td>
</tr>
<tr>
<td>• Durable distal tip</td>
<td>• Device delivery</td>
</tr>
<tr>
<td>• Good support</td>
<td>• Intra-cranial work</td>
</tr>
<tr>
<td><strong>Uses:</strong></td>
<td><strong>Examples:</strong></td>
</tr>
<tr>
<td>• Access</td>
<td>• Terumo Stiff Glide</td>
</tr>
<tr>
<td>• Sheath delivery</td>
<td>• Command / ES</td>
</tr>
<tr>
<td>• Lesion crossing</td>
<td>• Connect 250T</td>
</tr>
<tr>
<td>• Device tracking</td>
<td>• Spartacore</td>
</tr>
<tr>
<td>• “all-around wires”</td>
<td>• Whisper</td>
</tr>
</tbody>
</table>

**Examples:**
- Terumo Stiff Glide
- Command / ES
- Connect 250T
- Spartacore
- Whisper
Guidewire Selection

**Guidewire Basics**

- **Guide wire platforms**
  - 0.035 platform
  - 0.018 platform
  - 0.014 platform

- Different wire platforms have different advantages and disadvantages
  - Properties of the wires
  - Devices over which these wires can be delivered

Personal preference vs different wire for different purposes?
Guidewire Selection

**Guidewire Basics**

*Guidewire choice depends on lesion, location, and strategy!*

**Location:**
- Iliac lesions
- SFA/POP lesions
- Tibial/pedal lesions

<table>
<thead>
<tr>
<th>Guidewire Choice</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.035 vs 0.018/0.014 selection</td>
<td>Floppy (AT origin) vs Straight/supportive (Peroneal)</td>
</tr>
</tbody>
</table>

**Lesion:**
- Stenosis
- Occlusion
  - Soft, short
  - Calcified, chronic

<table>
<thead>
<tr>
<th>Lesion Strategy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stenosis = Avoid subintimal dissection at all costs</td>
<td></td>
</tr>
<tr>
<td>Occlusion = Strategy includes <strong>TRUE LUMINAL vs SUBINTIMAL</strong></td>
<td></td>
</tr>
</tbody>
</table>
Guidewire Selection

0.035 Wire Platform

- **Advantages**
  - Familiarity
  - Support level
  - Versatility / “workhorse” wires

- **Disadvantages**
  - Potential for more tissue trauma
    - Sub-intimal dissections
    - Wire perforations
  - Higher profile devices

- Versacore wire
- Terumo Glide Wire
- Terumo Stiff Glide
- Rosen Wire
- Bentson Wire
- Amplatz Wire
Guidewire Selection

0.035 Wire Platform

Uses:

- Access and Sheath placement
- Contralateral sheath placement
- Delivery of 035 system devices
- Recanalization of heavily calcified vessels
Guidewire Selection

**0.035 Wire Platform**

Escalating approach to contralateral sheath placement:
- Benson cerebral wire
- Versacore / Wholey wire
- Stiff Angled glidewire
- Amplatz Super Stiff wire
- Supracore wire

Crossing heavily calcified and tortuous iliacs:
- Switch out to floppier wire to reduce friction along greater / lesser curves of iliac vessels
Guidewire Selection

0.035 Wire Platform

Subintimal dissection for femoropopliteal occlusions

- Medial calcification or soft non-calcific lesions: 0.035 or 0.018/0.014 system

- Severe (especially intimal) calcification: requires 0.035 stiff glide wire the coaxial sheath/support catheter support.
Guidewire Selection

0.014 Wire Platform

- **Advantages**
  - Familiarity
  - Lower profile device systems
  - Less tissue trauma
  - Finesse
  - Variety

- **Disadvantages**
  - Lack of support
  - Tip shaft deformability
  - Durability
Guidewire Selection

0.014 Wire Platform

**Uses:**

- Tracking lower profile angioplasty balloons for sequential dilatation of the artery during/after crossing when larger 0.035 platform balloons won’t pass through a lesion / occlusion
- Performing subintimal dissections with less tissue trauma / dissection flaps
- Performing true luminal crossing of lesions / occlusions (especially with specialty CTO wires)
- Both SFA/pop and tibial interventions
Guidewire Selection

0.014 Wire Platform

Advantages:
- Workhorse in 0.014 platform
- Indestructible tip
- Extremely responsive
- Holds sharp “J-tip” on prolapsing and can be used for both SFA and even tibial sub-intimal dissections

<table>
<thead>
<tr>
<th>Hi-Torque Command™</th>
<th>Abbott Vascular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device Description</td>
<td>Hybrid construction 0.014” wire designed</td>
</tr>
<tr>
<td>Characteristics</td>
<td>Shapeable and durable nitinol tip with polymer cover and hydrophilic coating. Stainless Steel body</td>
</tr>
<tr>
<td>Tip Weight</td>
<td>2.8 gm, 3.5 gm (ES)</td>
</tr>
<tr>
<td>Lengths</td>
<td>190, 300 cm</td>
</tr>
</tbody>
</table>
Guidewire Selection

0.014 Wire Platform

Device Support Profiles

HT Command
HT Command ES
MIRACLEBROS 3
MIRACLEBROS 6
MIRACLEBROS 12

Distance from Guide Wire Tip (mm)
Guidewire Selection

0.014 Wire Platform

- Multiple high grade lesions due to eccentric plaque although most of the lumen is patent for much of the vessel
- Goal is to avoid going subintimal and use a wire that will allow you to carefully navigate through the high grade lesions without going from the true lumen to the subintimal space
- The low profile of 0.014 wires and the ability to navigate these through tight spaces make this system ideal for these types of lesions
Guidewire Selection

0.014 Wire Platform

Command ES 0.014 Wire
Guidewire Selection

0.014 Wire Platform

- Tight guide wire loop in Hi-Torque Command wire prevents large dissection channel.
- Durable polymer-coated Nitinol wire tip reforms into steerable floppy tip.
Guidewire Selection

0.014 Wire Platform

Extremely high grade stenoses:
- Manueverability: 014
  Command, Fielder XT, Miracle Bros
- Tight lesion: Fielder XT, Spartacore
Guidewire Selection

0.014 Wire Platform

Lesion in lateral plantar artery and absence of plantar arch
Guidewire Selection

0.014 Wire Platform

0.014” support catheter +Hi-Torque Command™ followed by 2x100 Armada 0.014” Balloon
Guidewire Selection

0.014 Wire Platform

Restoration of Lateral Plantar artery with communication to plantar arch and tarsal arteries
Guidewire Selection

0.018 Wire Platform

- **Advantages**
  - Support (> than 014 platform)
  - Relatively low profile
  - Potential to function as “workhorse”
  - Penetration Power

- **Disadvantages**
  - Relatively few wires options available until recently
  - Lack of familiarity

**0.018 Wires offer excellent balance between profile, support, and applicability for specialty applications**

- Connect
- Connect Flex
- Connect 250T
- V-18 Control
- Treasure-12
- Astato 30
Guidewire Selection

**0.018 Wire Platform**

**Hi-Torque Connect™**
- Workhorse wire with supportive body, soft tip, and polymer cover
- 4gm tip load, Ideal for straight run-off with soft to moderately calcified lesions in focal stenoses

**Hi-Torque Connect™ Flex**
- Workhorse wire with flexible body, stiff tip, and polymer cover
- 12gm tip load and flexibility for tortuous anatomies with acute take-off and moderately calcified lesions

**Hi-Torque Connect™ 250T**
- Specialty wire with supportive body and stiff, tapered tip for challenging lesions
- Tapered tip and 30gm tip load for increased penetration power for long, heavy calcifications
Guidewire Selection

0.018 Wire Platform
Guidewire Selection

0.018 Wire Platform


Progression of microvasculature at (A) 2 weeks, (B) 6 weeks, (C) 12 weeks, (D) 18 to 24 weeks.

Intravascular channels are shown in red; extravascular channels are shown in blue.
Guidewire Selection

**0.018 Wire Platform**

Low profile tip combined with high gram tip load leads to increased penetration power and increased ability to locate and utilize the microchannels present in most CTOs.

<table>
<thead>
<tr>
<th>Wire</th>
<th>Platform</th>
<th>Make</th>
<th>Core</th>
<th>Tip Load</th>
<th>Support</th>
<th>Penetration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victory</td>
<td>0.018</td>
<td>Boston Scientific</td>
<td>Stainless</td>
<td>12gm,18g m,30gm</td>
<td>++</td>
<td>++/+++</td>
</tr>
<tr>
<td>Connect</td>
<td>0.018</td>
<td>Abbott</td>
<td>Stainless</td>
<td>4gm</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Connect Flex</td>
<td>0.018</td>
<td>Abbott</td>
<td>Stainless</td>
<td>12gm</td>
<td>+</td>
<td>+</td>
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<td>Connect 250T</td>
<td>0.018</td>
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<td>Stainless</td>
<td>30gm</td>
<td>+++</td>
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<td>Astato 30</td>
<td>0.018</td>
<td>Asahi</td>
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<td>30gm</td>
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</tr>
<tr>
<td>Treasure 12</td>
<td>0.018</td>
<td>Asahi</td>
<td>Stainless</td>
<td>12gm</td>
<td>++</td>
<td>++</td>
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</table>
Guidewire Selection

0.018 Wire Platform

- Densely calcified tibial lesion
- CXI™ 0.018 Support catheter
- Tapered tip of Hi-Torque Connect™250T engaging lesion
Guidewire Selection

0.018 Wire Platform

6F 70 cm Raabe™ Sheath

Cook CXI™ 0.035 Catheter

Cook CXI™ 0.018 Catheter

Abbott Hi-Torque Connect™ 250T 0.018” Wire
Guidewire Selection

0.018 Wire Platform

Subintimal dissection for femoropopliteal occlusions

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Hi-Torque Connect™ 250T

Specialty wire with supportive body and stiff, tapered tip for challenging lesions

Tapered tip and 30gm tip load for increased penetration power for long, heavy calcifications
Guidewire Selection

0.018 Wire Platform

Some of these newer 0.018 wires have durable enough tips along with the added support compared to 0.014 wires that allow them to be reasonably good wires for SFA subintimal dissections:

- Hi-Torque Connect
- Hi-Torque Connect Flex
- V-18 Control

Sub-intimal Wire Loop with 0.018 wire
Conclusions

- Guide wire selection depends on lesion, location, and strategy.
- An increasing array of available wires has increased our ability to cross lesions and deliver therapy.
- Understanding wire construction leads to an increased understanding of a specific wire’s performance properties, and helps us choose the proper wire for the specific goal.
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