Guidewires for Coronary Angioplasty

(Alambres guía de Angioplastia Coronaria)

- Diferentes tipos
- Descripción
- Usos específicos

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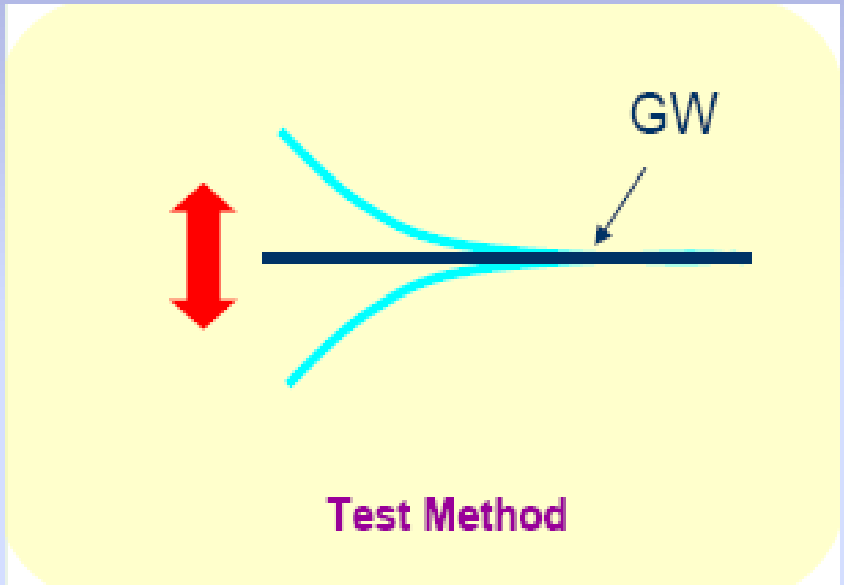
Main Functions of Guidewires

- To **track** through the vessel.
- To **access** the lesion.
- To **cross** the lesion atraumatically.
- To provide **support** for interventional devices.

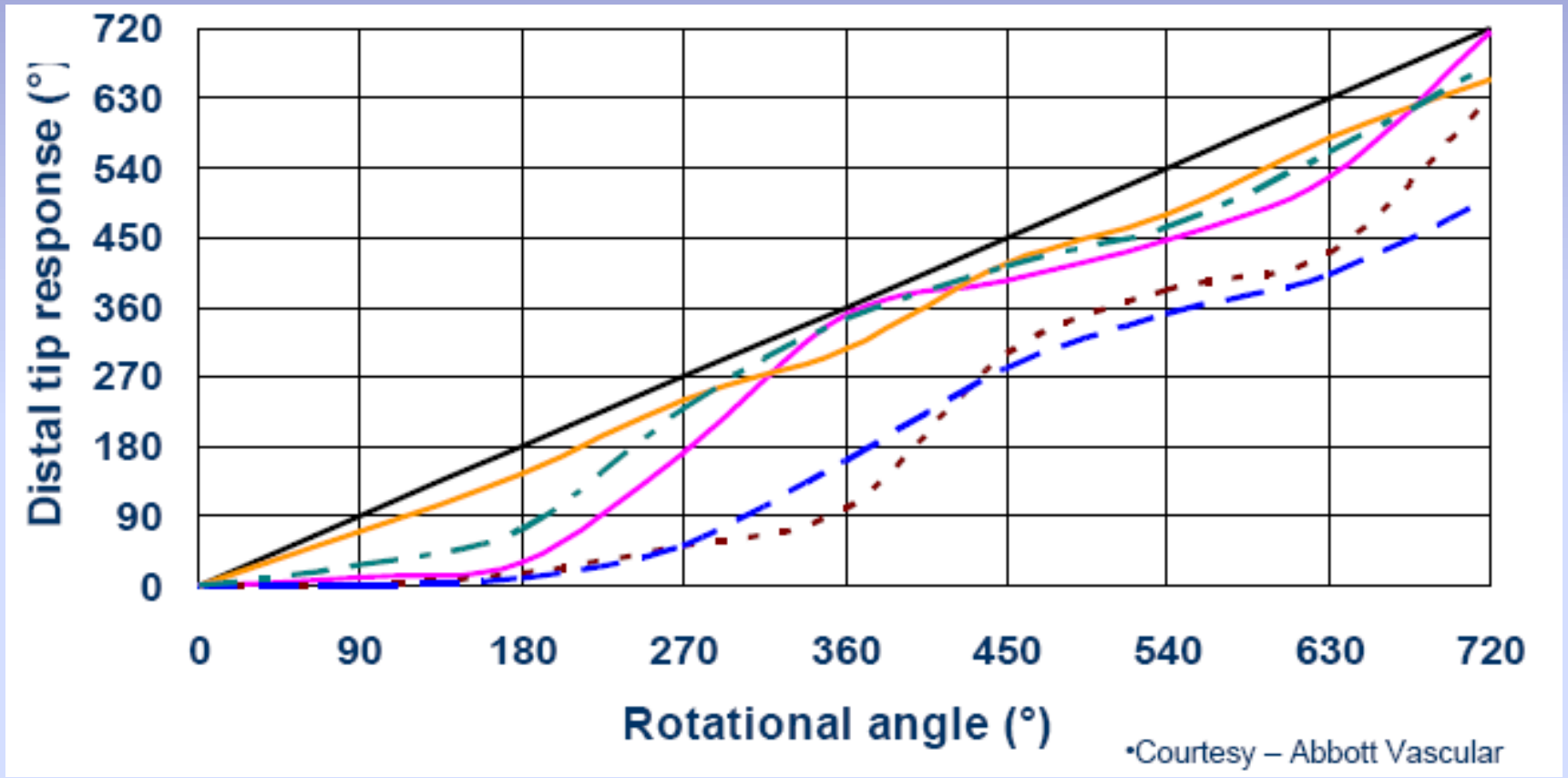
- **Tip load** rigidez de la punta
- **Tip stiffness** dureza de la punta
- **Guidewire flexibility** flexibilidad
- **Ability to shape** capacidad de moldura
- **Shaping memory** memoria
- **Shaft support** soporte del cuerpo
- **Torque transmission** transmisión del torque
- **Trackability** seg. del cuerpo a la punta
- **Resistance to trapping** resistencia al atrapamiento
- **Steerability** capacidad para ser dirigida

Support

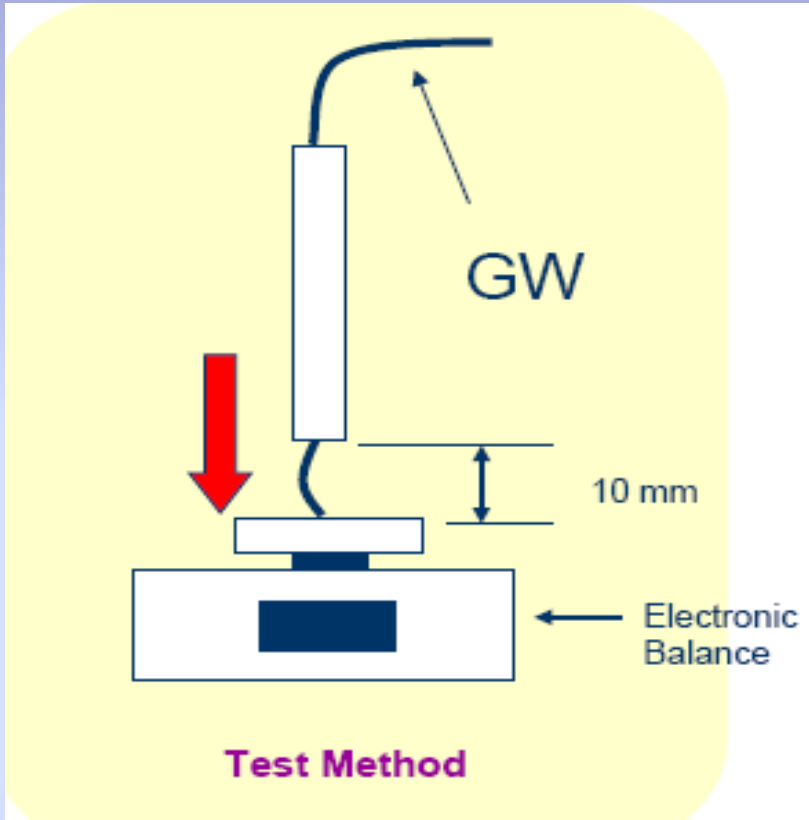


- The wire is fixed/secured at various distances from the tip, the wire is then bent to test the force needed for bending
- Lower support decreases friction/vessel wall injury and increases wire deliverability

Torque


Distal tip response (°)
720
630
540
450
360
270
180
90
0
0
90
180
270
360
450
540
630
720
Rotational angle (°)
•Courtesy – Abbott Vascular

Tip load



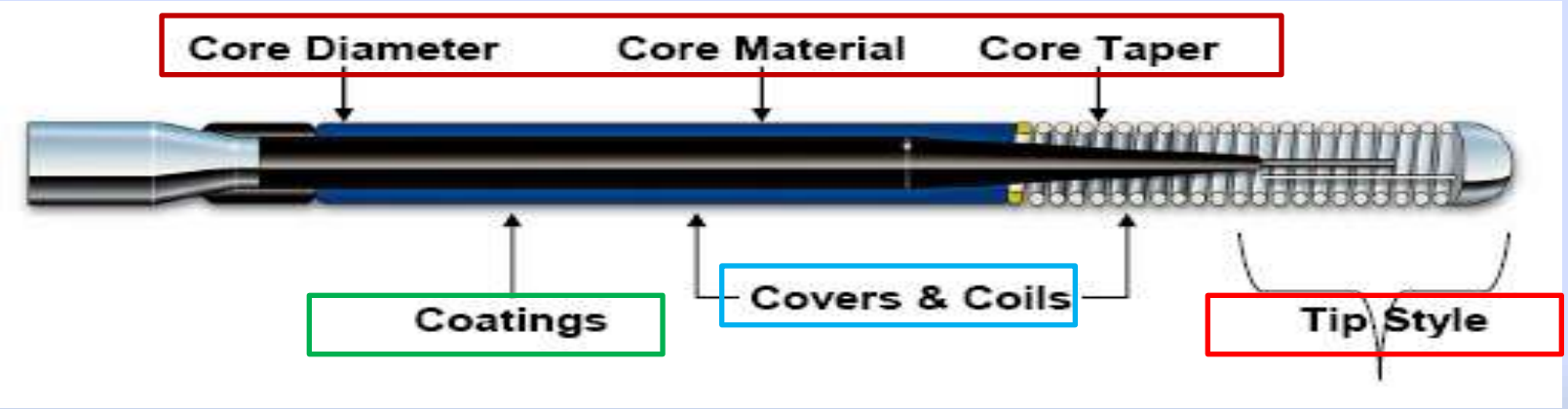
Tip load value (tip stiffness) gives a numeric value to the tip

- The buckling load is defined as tip load
- The distance from the lower end of the pipe to the upper side of the electronic balance is 10mm

Guidewires

Four main components:

- Central core (corazón)
- Outer covering (cubierta)
- Distal tip (punta)
- Surface coating (recubrimiento)



Guidewires

Four main components:

- **Central core**: is the longest portion of the wire and forms the backbone of the wire.

  "Core-to-tip": the tapered core reaches the distal tip
  better force transmission and greater tactile response

  "Two-piece core": utilizing a shaping ribbon at the distal tip
  more durable shaping memory but less tactile response and force transmission.

Guidewires:

Four main components

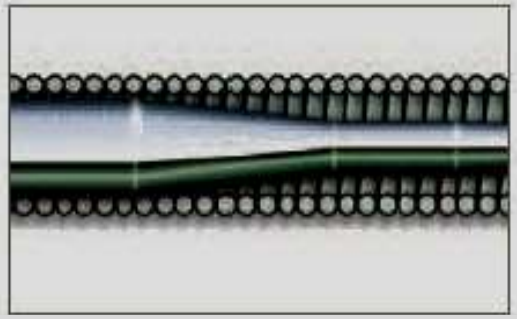
Central Core Diameter

CORE DIAMETER

The core diameter of each guide wire is engineered for its particular clinical application.

Larger Core Diameter

- Increased support for device delivery and vessel straightening
- More material for superb torque



Smaller Core Diameter

- For enhanced tracking and flexibility

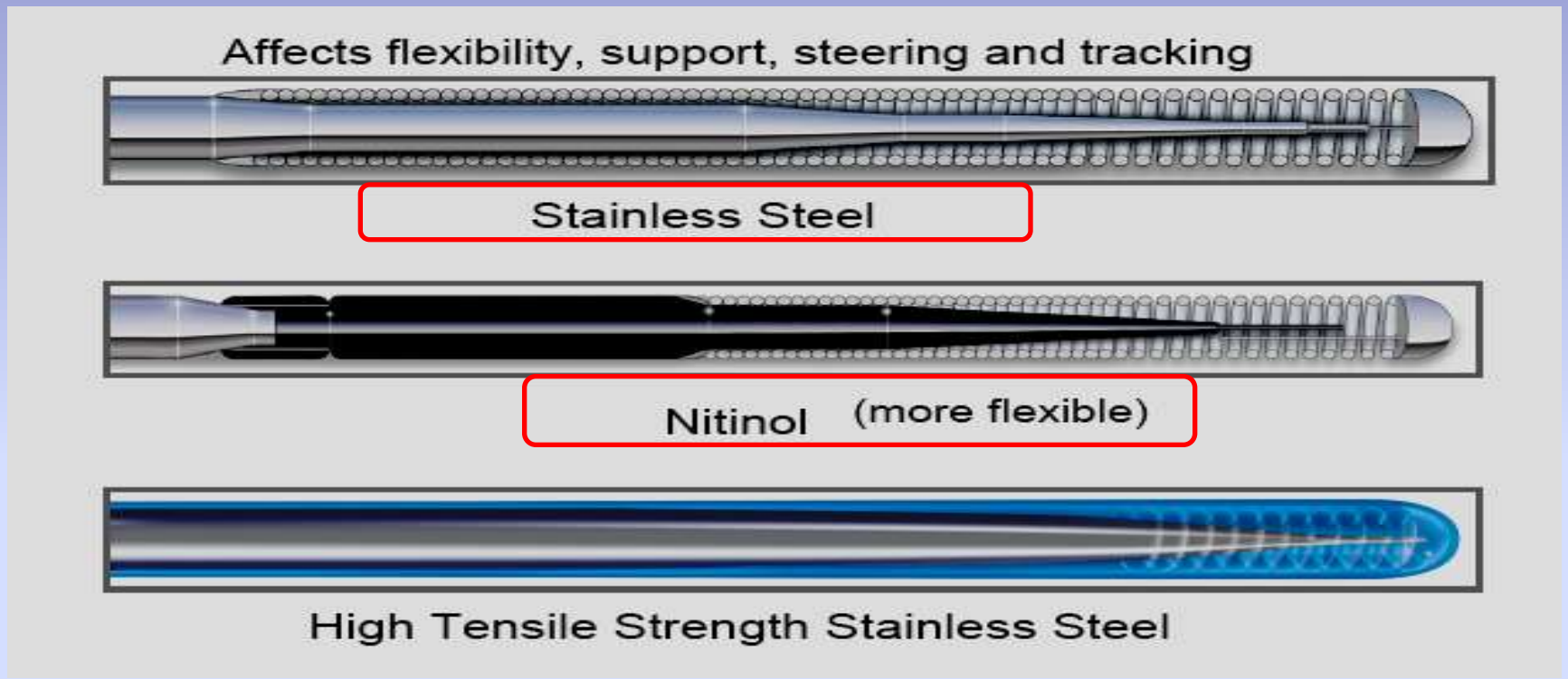
Trackability: ability of wire body to follow tip around bends

(capacidad del cuerpo de seguir a la punta en curvas)

Guidewires:

Four main components

Central Core Material



Usually core is made of **stainless steel** (excellent torque and shaping) but may be **nitinol or nickel titanium** (reduced torque but greater flexibility). Some guidewires have a **composite** core design.

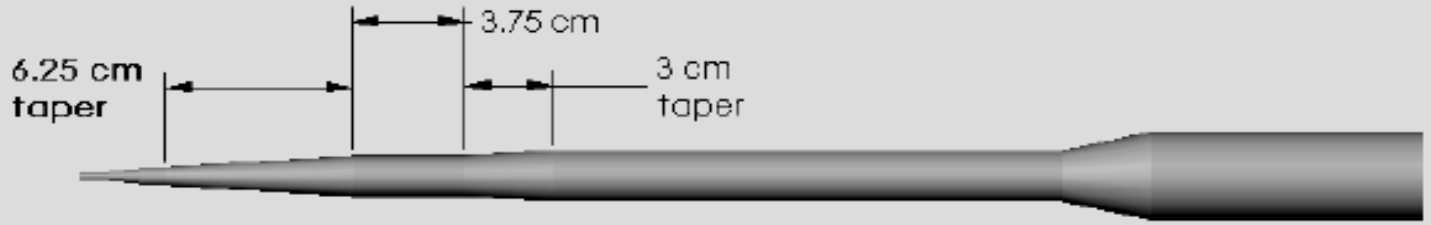
Guidewires:

Four main components

Central Core: short vs long tapers

Long tapers → **Increased steerability**

Increased flexibility



Short tapers → **Increased Support**

Increased Torque

Guidewires

Four main components:

- **Outer covering**: designed to:
  - -Keep the overall diameter consistent
  - -Complement the core´s physical properties
  - -Provide a smooth and noninteractive surface

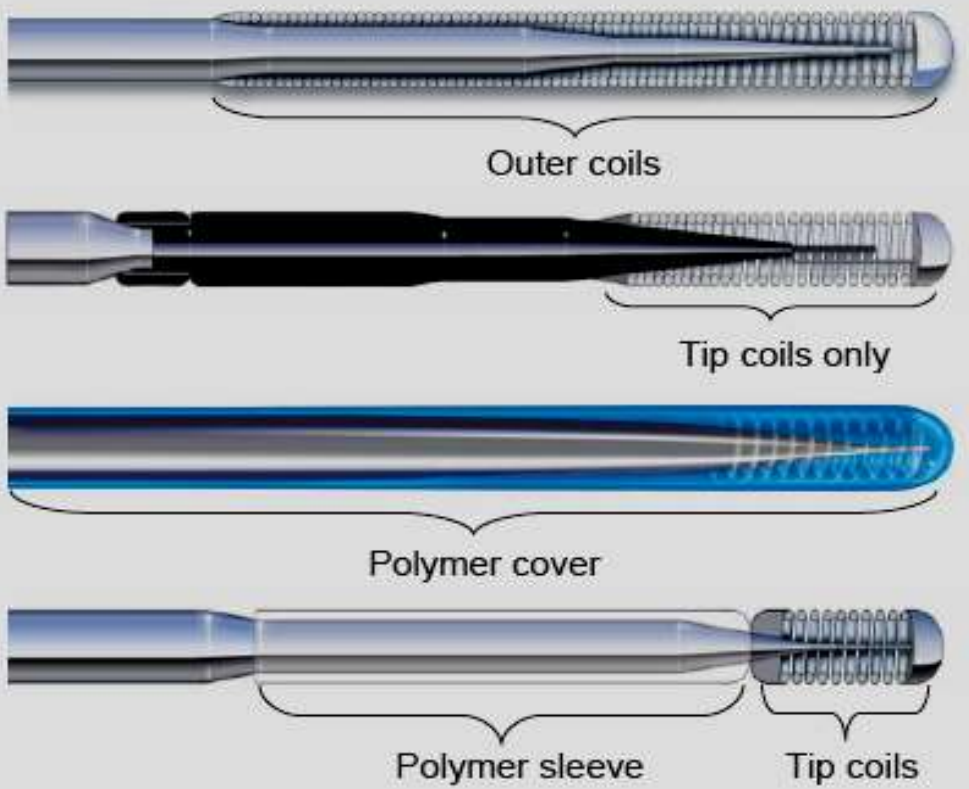
Most wires employ a metal coil, however some use a polymer sleeve for increased lubricity

Not to be confused with **coating**

Guidewires

Four main components:

Outer Covering



- ✓ Coils provide tactile feedback, radiopacity and maintain constant overall diameters
- ✓ Polymer covers/sleeves provide optimal lubricity to overcome resistance and access to the lesion

Guidewires

Four main components:

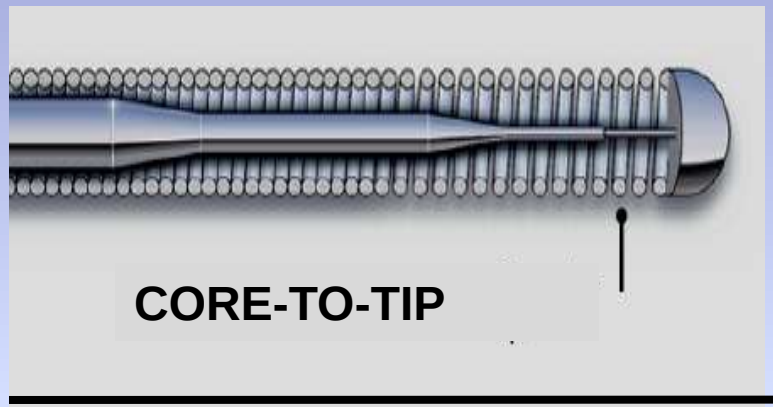
➢Distal tip:

- ➢usually is a spring coil extending from the distal untapered part of the central core toward the distal tip weld
- ➢this spring coil is variable in length (1 to 30 cm.)
- ➢It has a radio-opaque section of variable length in the distal portion (usually 2 to 3 cm but may be more)
- ➢the distal tip weld is a short compact cap and is the true distal end of the wire.

Guidewires

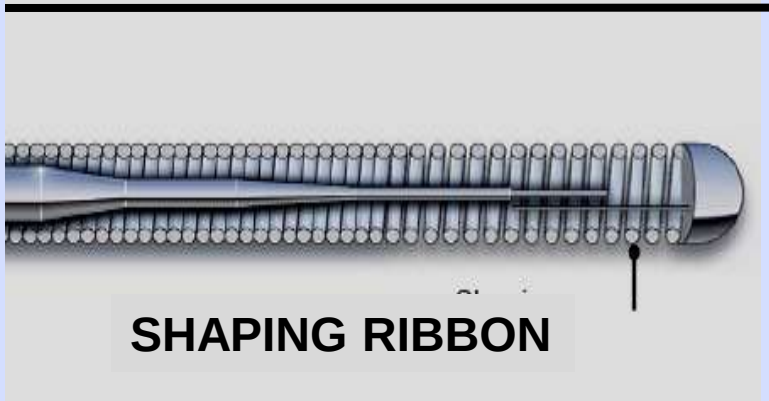
Four main components:

➢Distal tip:



CORE-TO-TIP

- ✓ Force transmission
- ✓ Tactile feedback
- ✓ Tip stiffness/Tip-load



SHAPING RIBBON

- ✓ Better steering
- ✓ Better shapability
- ✓ Flexibility, softness
- ✓ Ability to prolapse

Guidewires

Four main components:

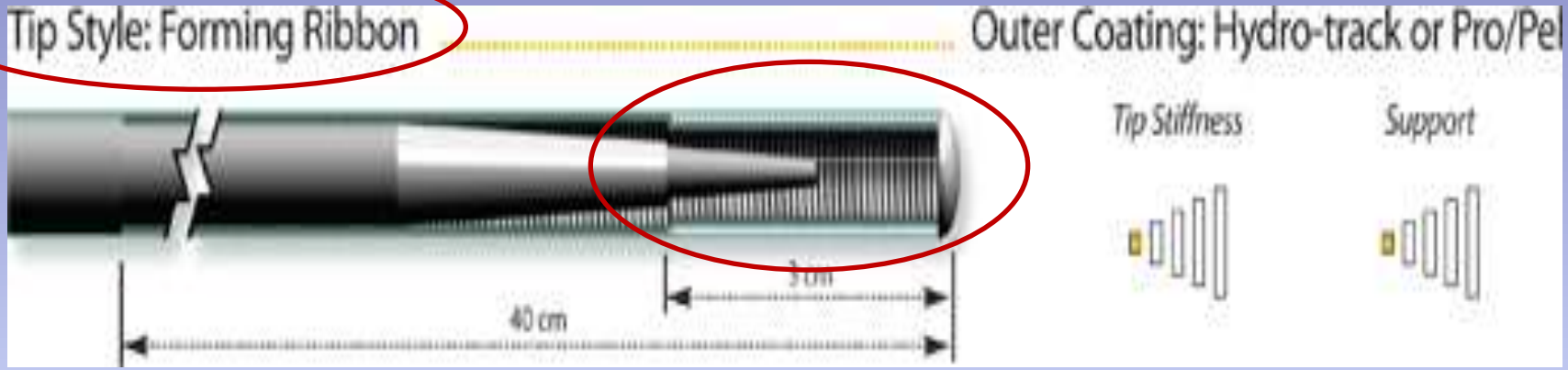
➢ Surface coating:

- ➢ reduce friction
- ➢ facilitate trackability
- ➢ reduce trombogenicity

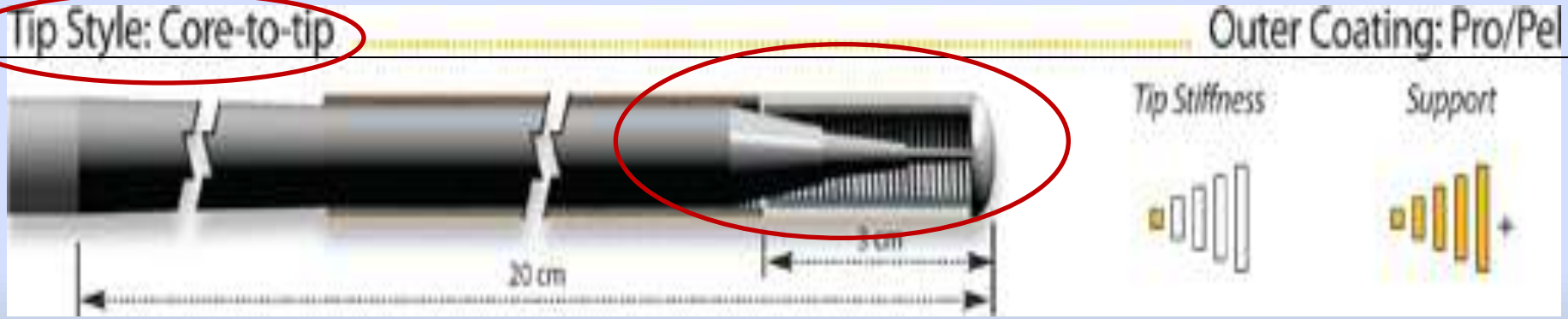
Must be chemically stable, biocompatible and thermo-resistant

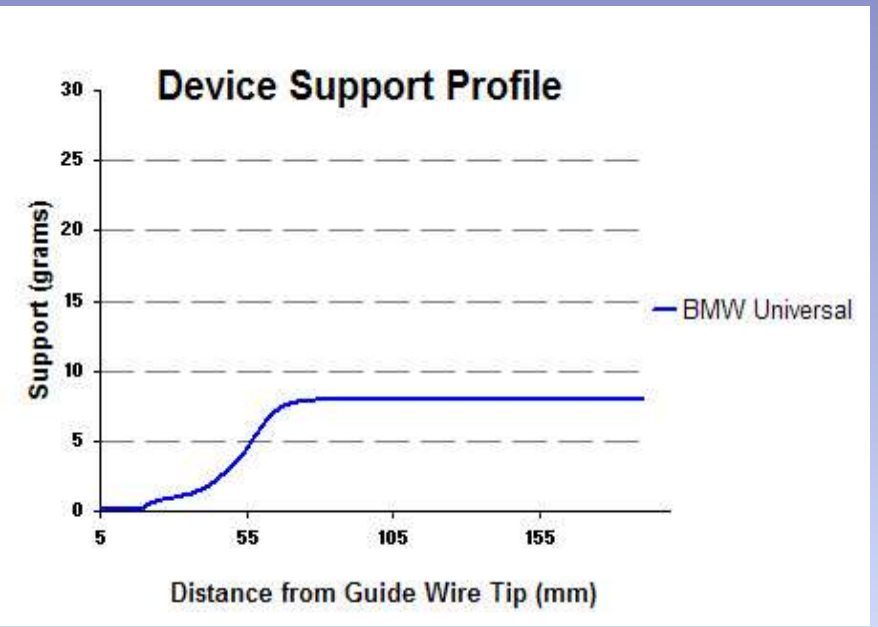
Most guidewires are coated with PTFE but there are many propietery hydrophilic coatings (M-Coat, Hydro-Track or Slip-Coat, etc.)

Cougar LS Light suppport



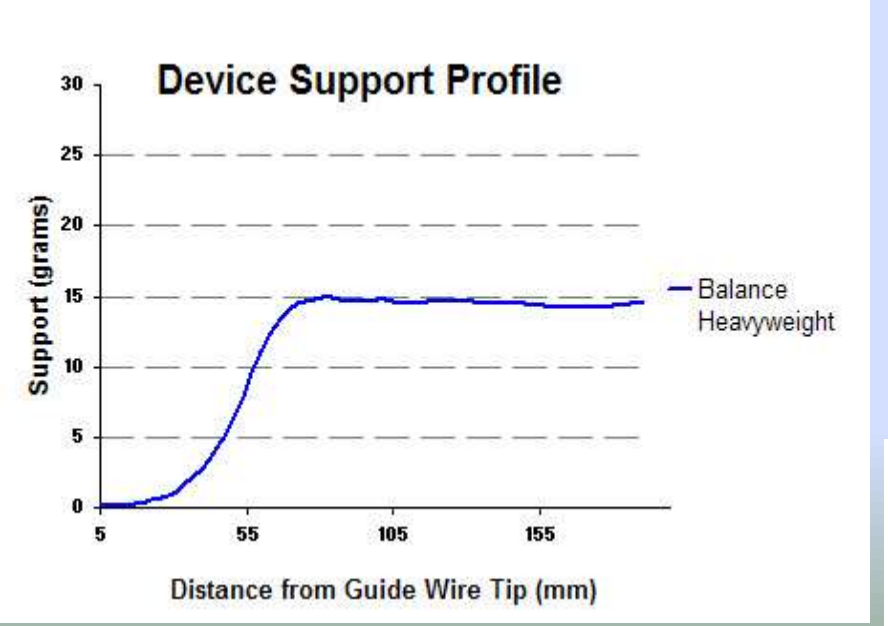
Thunder®





HI-TORQUE BALANCE MIDDLEWEIGHT

Tip load: 0.7 g
Radiopaque length: 3 cm
Outside diameter: 0.014"
Tip Outside diameter: 0.014"
Tip style: Shaping Ribbon
Core Material: ELASTINITE Nitinol



HI-TORQUE BALANCE HEAVYWEIGHT

Tip load: 0.7g
Radiopaque length: 4.5 cm
Outside diameter: 0.014"
Tip Outside diameter: 0.014"
Tip style: Shaping Ribbon
Core Material: ELASTINITE Nitinol

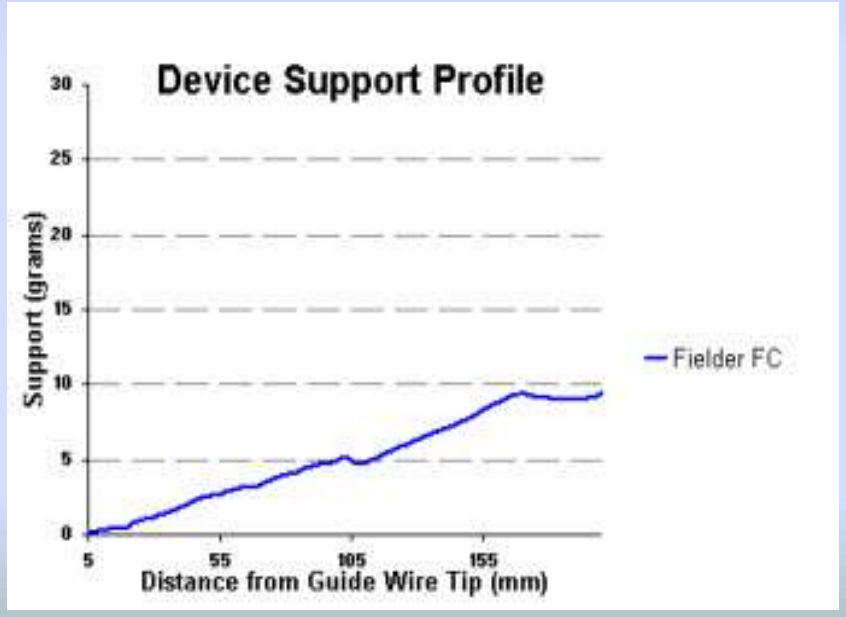
ASAHI Fielder FC

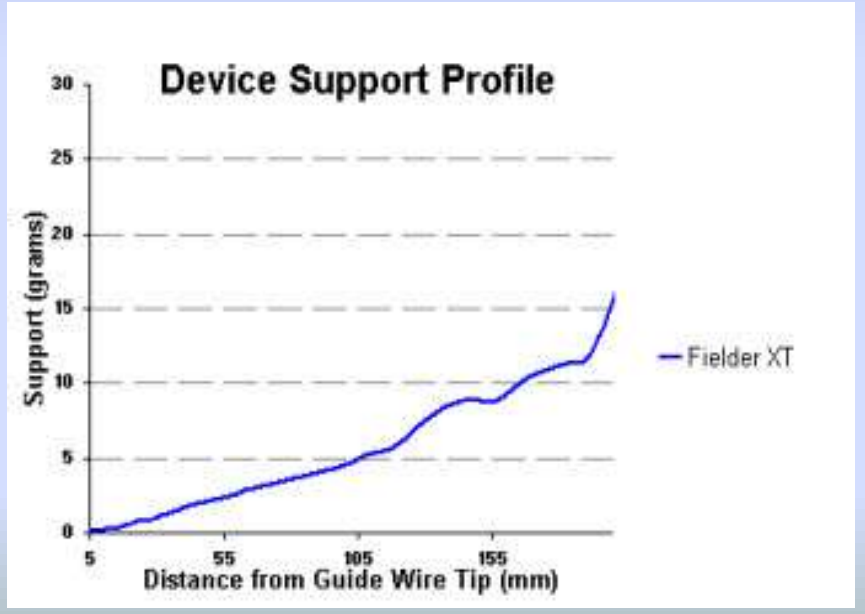
Tip load: 1.6 g
Radiopaque length: 3 cm
Outside diameter: 0.014“

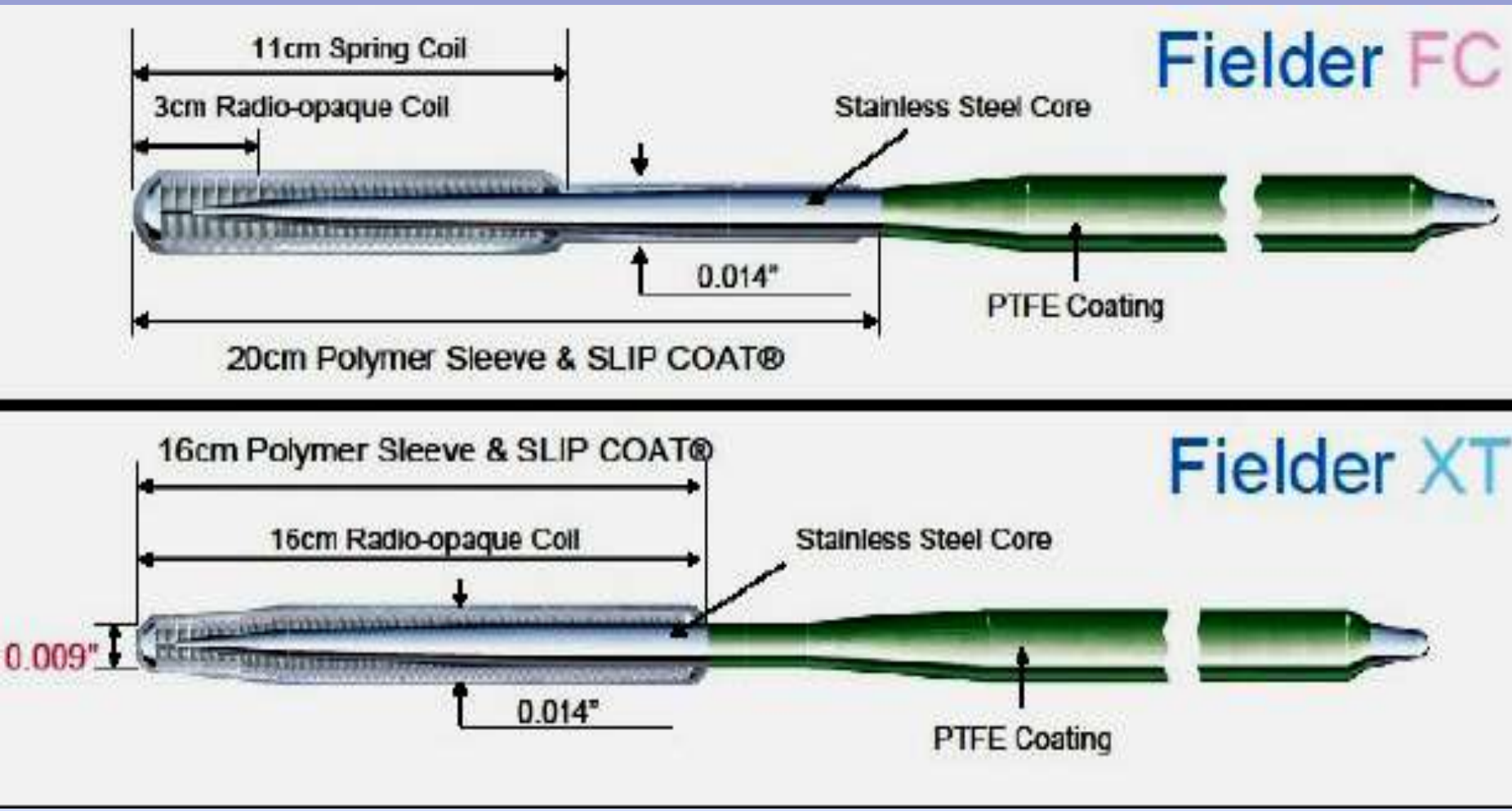
Coating: Hydrophilic
Tip style: Core to tip
Polymer cover: Full polymer

ASAHI Fielder XT

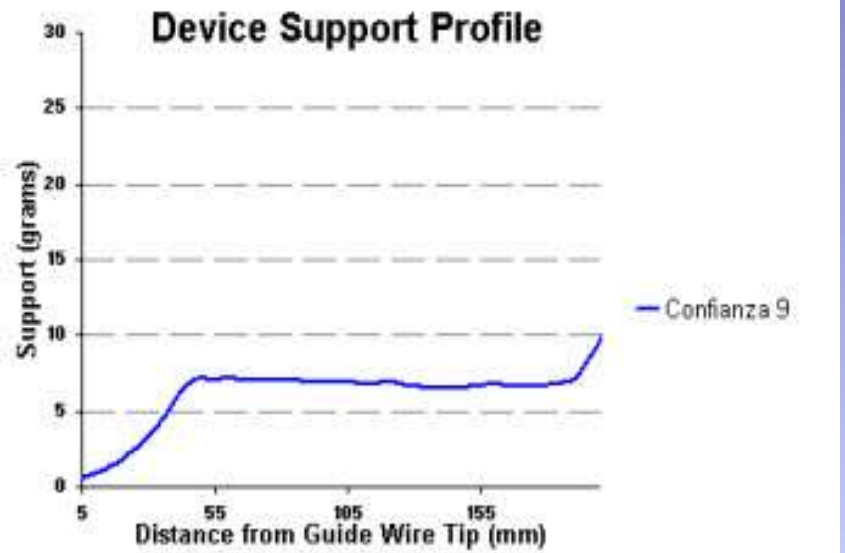
Tip load: 1.2 g
Radiopaque length: 16 cm
Outside diameter: 0.014"
Tip diameter: 0.009"
Coating: Hydrophilic
Tip style: Core to tip
Polymer cover: Full polyme



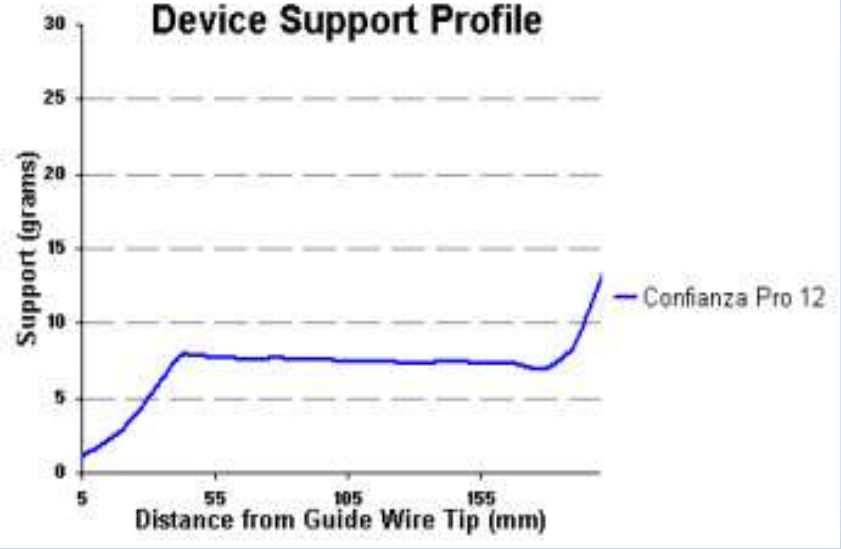




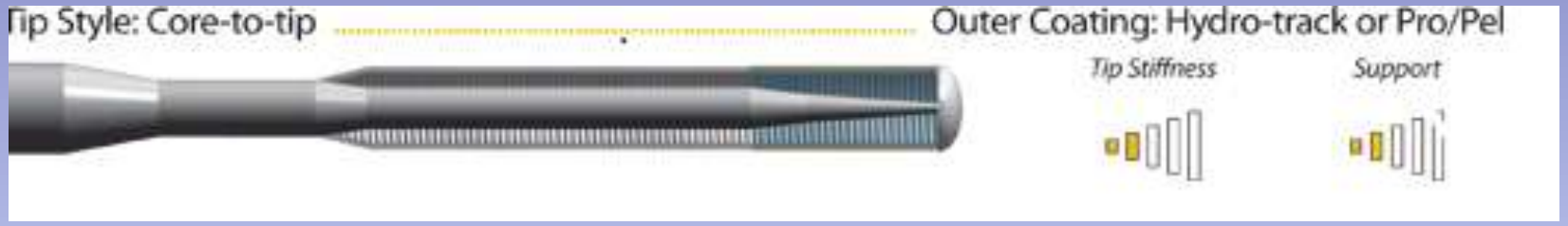
Central Core **Outer Covering** **Distal Tip** **Coating**



ASAHI Confianza PRO 9
Tip load: 9.3 g
Radiopaque length: 20 cm
Outside diameter: 0.014"
Tip Outside diameter: 0.009"
Coating: Hybrid
Tip style: Core to tip
Polymer cover: none

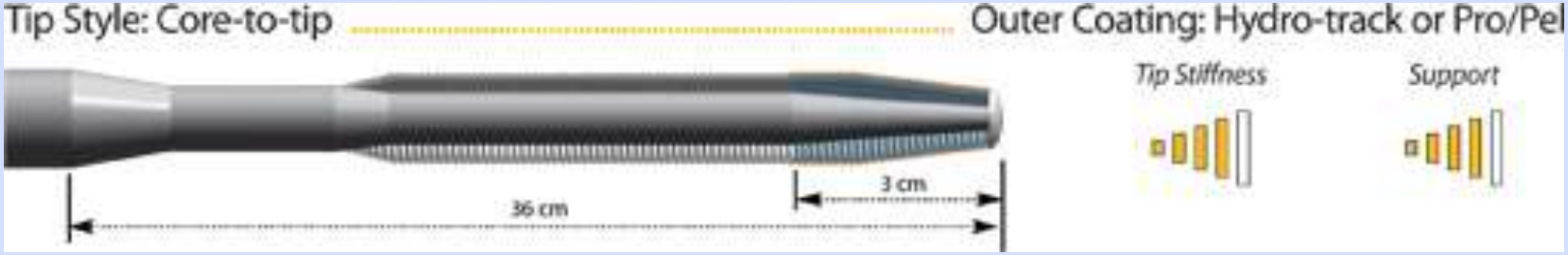


ASAHI Confianza PRO 12
Tip load: 12.4 g
Radiopaque length: 20 cm
Outside diameter: 0.014"
Tip Outside diameter: 0.009"
Coating: Hybrid
Tip style: Core to tip
Polymer cover: none



Persuader 3

Persuader 6



Persuader 9

Guidewires for Chronic Total Occlusions

Features required for CTO wires

1. *Penetration force* for penetrating proximal fibrous cap and advancing into true lumen
2. *Pushability* for crossing chronic occlusions and complex lesions with heavy calcifications and tough fibrous tissues.
3. *Steerability* for easy manipulate in various directions with good torque transmission
4. *Shaping Memory* of the tip

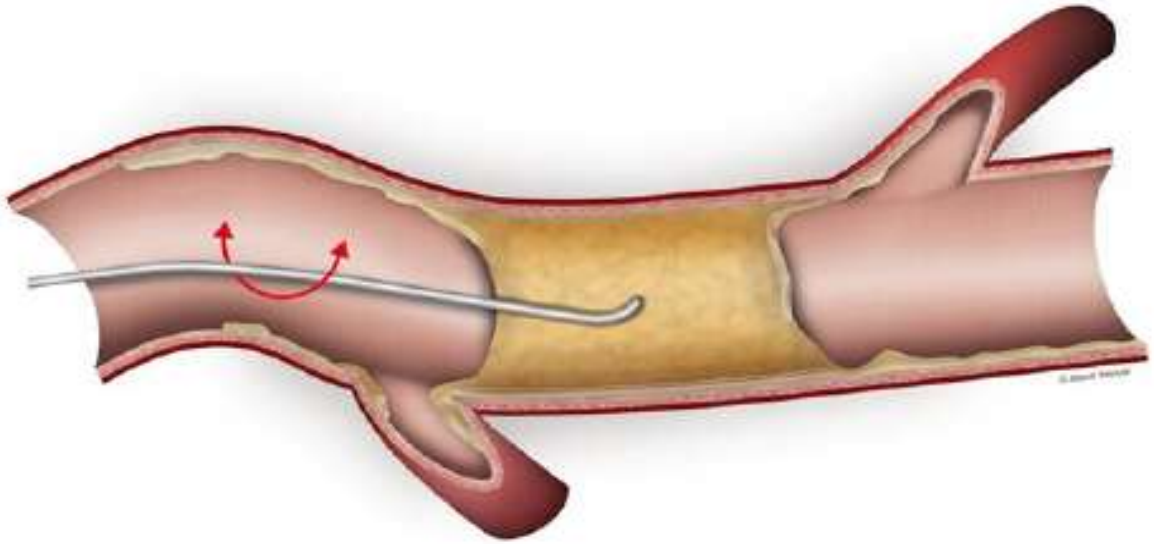
Conventional techniques for advancing CTO wires

- **Drilling technique: (perforación)**
  the guidewire is rotated clockwise and counterclockwise while the tip is pushed moderately against the CTO.

- **Penetrating technique: (penetración)**
  the operator aims at the target with the tip of the guidewire without rotation.

- **Sliding (deslizamiento)**

Conventional techniques for advancing CTO wires: Controlled Drilling



Some recomended wires:

Straight Tip Guide Wires

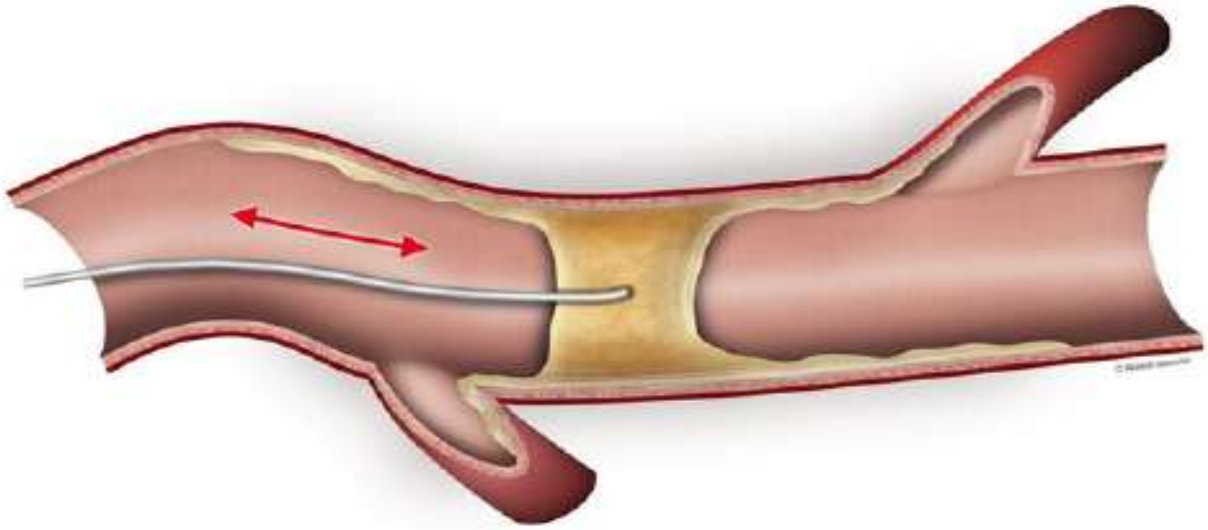
- ASAHI MIRACLEBROS 3
- ASAHI MIRACLEBROS 4.5
- ASAHI MIRACLEBROS 6
- ASAHI MIRACLEBROS 12

Tapered Tip Guide Wires

- HT CROSS-IT 100XT
- HT CROSS-IT 200XT
- HT CROSS-IT 300XT

Clinical application: Inside *calcified and fibrotic CTO* segment, *ISR*, *Long CTO* segment

Conventional techniques for advancing CTO wires: Penetration Technique



Some recomended wires:

Straight Tip Guide Wires

- ASAHI MIRACLEBROS 12

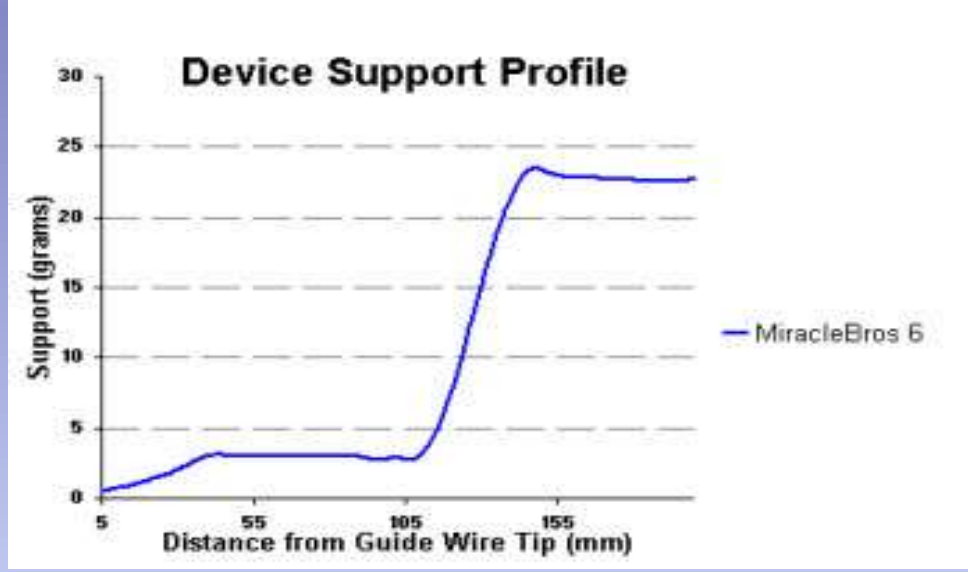
Tapered Tip Guide Wires

- ASAHI CONFIANZA 9
- ASAHI CONFIANZA PRO 9
- ASAHI CONFIANZA PRO 12
- HT CROSS-IT 400XT

Clinical Application: Penetrate *proximal and distal cap*, *False to true lumen (IVUS)*, Change wire direction (2nd wire in *parallel wire technique*)

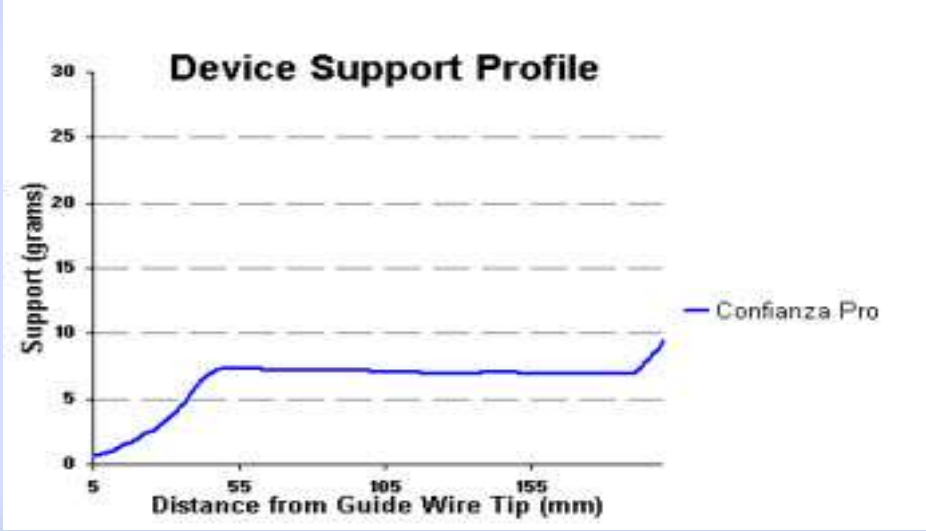
ASAHI MiracleBros 6

Tip load: **8.8 g**
Radiopaque length: 11 cm
Outside diameter: 0.014"
Coating: Hydrophobic
Tip style: Core to tip
Polymer cover: none

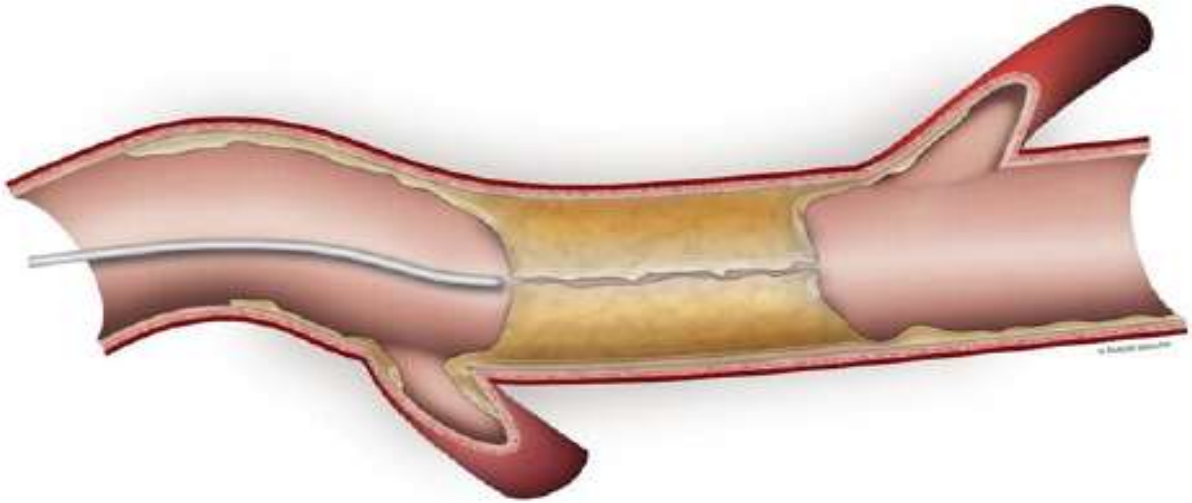


ASAHI Confianza PRO 9

Tip load: **9.3 g**
Radiopaque length: 20 cm
Outside diameter: 0.014"
Tip Outside diameter: **0.009"**
Coating: Hybrid
Tip style: Core to tip
Polymer cover:none



Conventional techniques for advancing CTO wires: Sliding – Microchannel tracking



Very lubricious polymer covered guide wires are used to slide through narrow lesions or functional occlusions.

Some recomended wires:

Tapered Polymer Tip Guide Wire

- ASAHI FIELDER XT

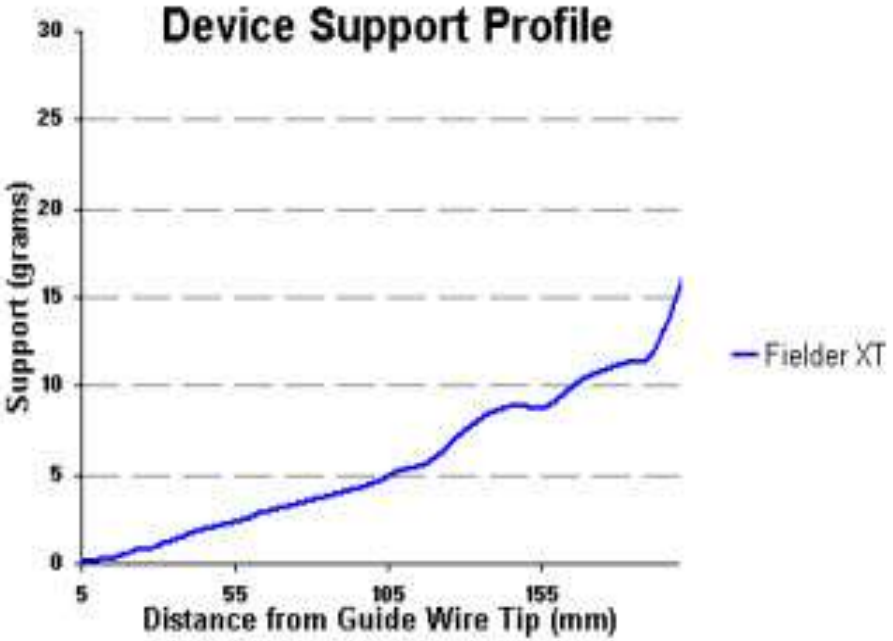
Polymer Covered Guide Wires

- HT PILOT 150
- HT PILOT 200

Clinical Application: Tracking *micro channels* (visible and invisible)

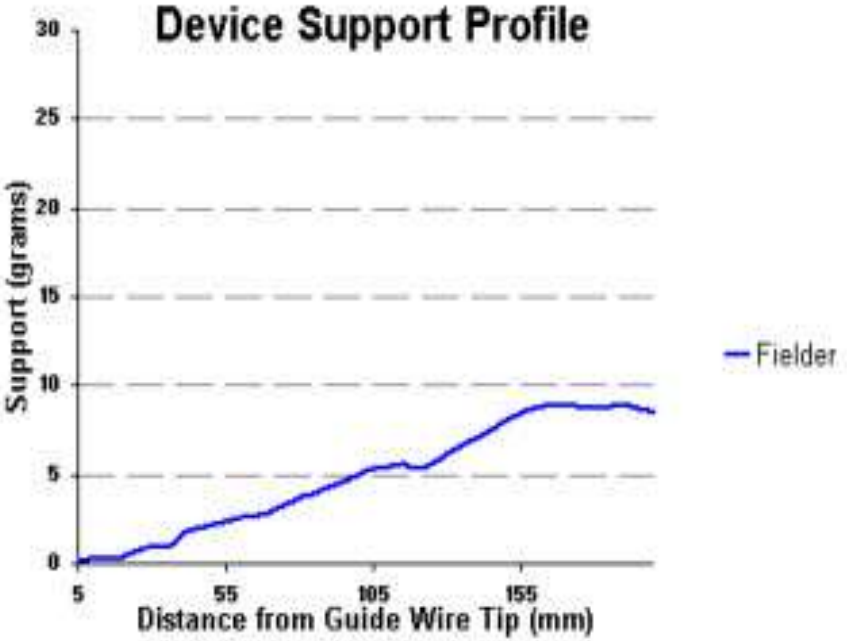
ASAHI Fielder XT

Tip load: 1.2 g
Radiopaque length: 16 cm
Outside diameter: 0.014"
Tip diameter: 0.009"
Coating: Hydrophilic
Tip style: Core to tip
Polymer cover: Full polym



ASAHI Fielder

Tip load: 3.7 g
Radiopaque length: 3 cm
Outside diameter: 0.014"
Coating: Hydrophilic
Tip style: Core to tip
Polymer cover: Full polyme



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SAC 2013

Del 18 al 20 de Octubre del 2013 / CENTRO DE CONVENCIONES "LA RURAL" - Buenos Aires, Argentina

Fecha límite para envío de temas libres: **29 de mayo**