



The Fundamentals

Chapter 1:

Patient selection

Patient preparation

Specific hardware

Puncture

Haemostasis



Patient selection criteria

Demographic criteria:

Age

Weight and height

Gender

Risk factor: hypertension

Clinical status

Radial pulse



Exclusion criteria

Non-palpable or weak radial pulse

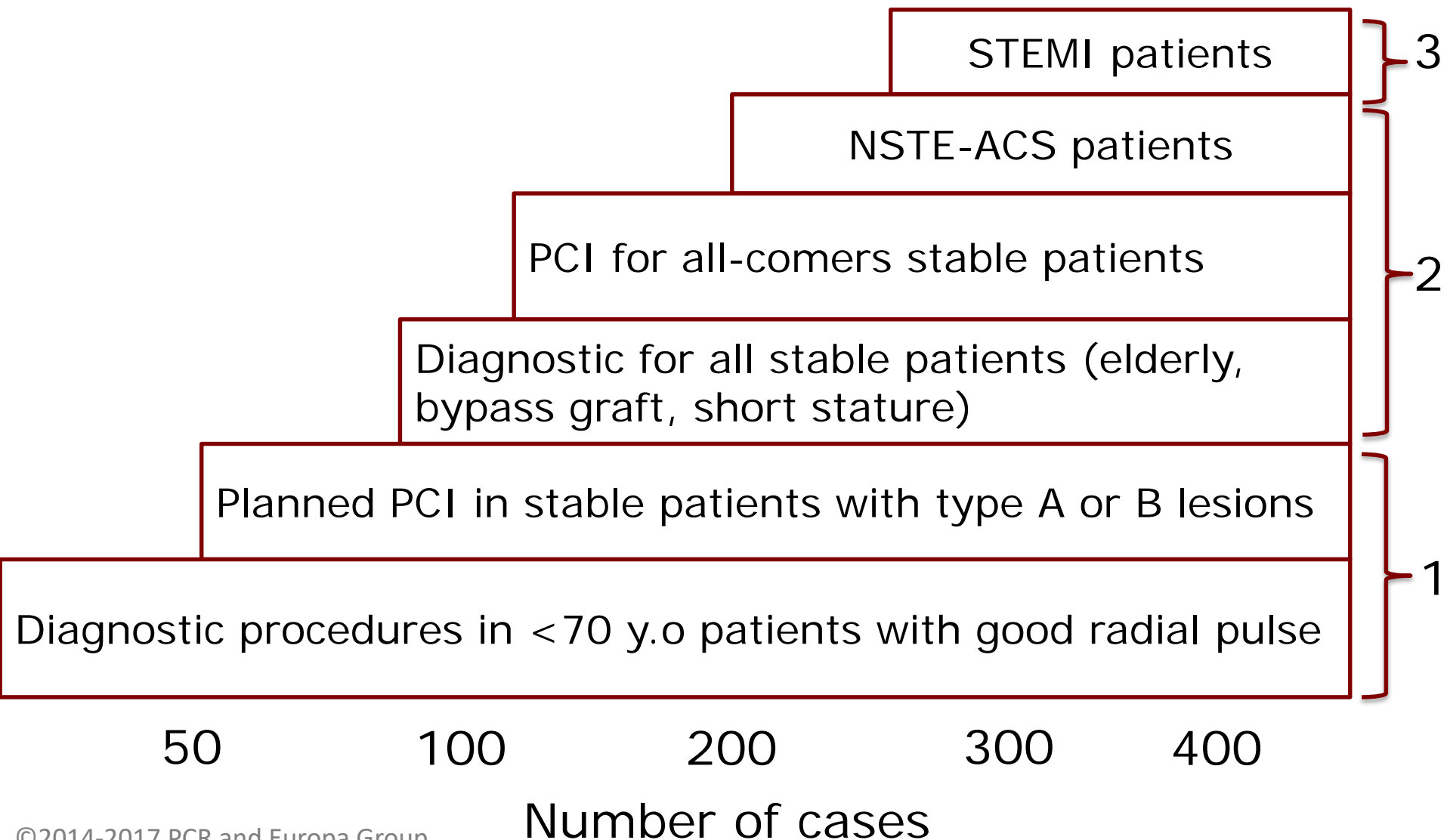
Non-patent collaterals of palmar arch

Chronic renal failure with A-V fistula

Raynaud's syndrome

Cardiogenic shock

Learning steps and competency levels





Patient selection - summary

From simple to complex patients according to:
age, stature, gender, HTA, clinical status, radial pulse

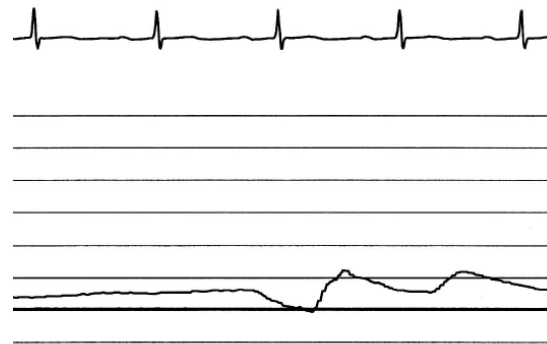
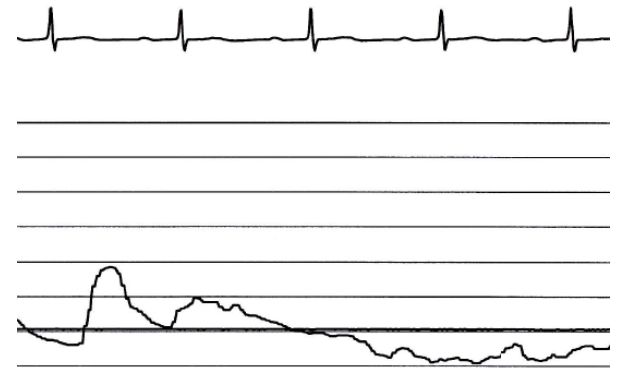
Exclusion criteria	Relative exclusion
Poor weak radial pulse	Women with short stature
Non-patent hand collateral arteries	Acute coronary syndrome or cardiogenic shock
Raynaud's syndrome	Old patient with HTA
Known severe innominate subclavian artery disease	Chronic renal failure patients with fistula
	Complex PCI

Oxymetry Barbeau test



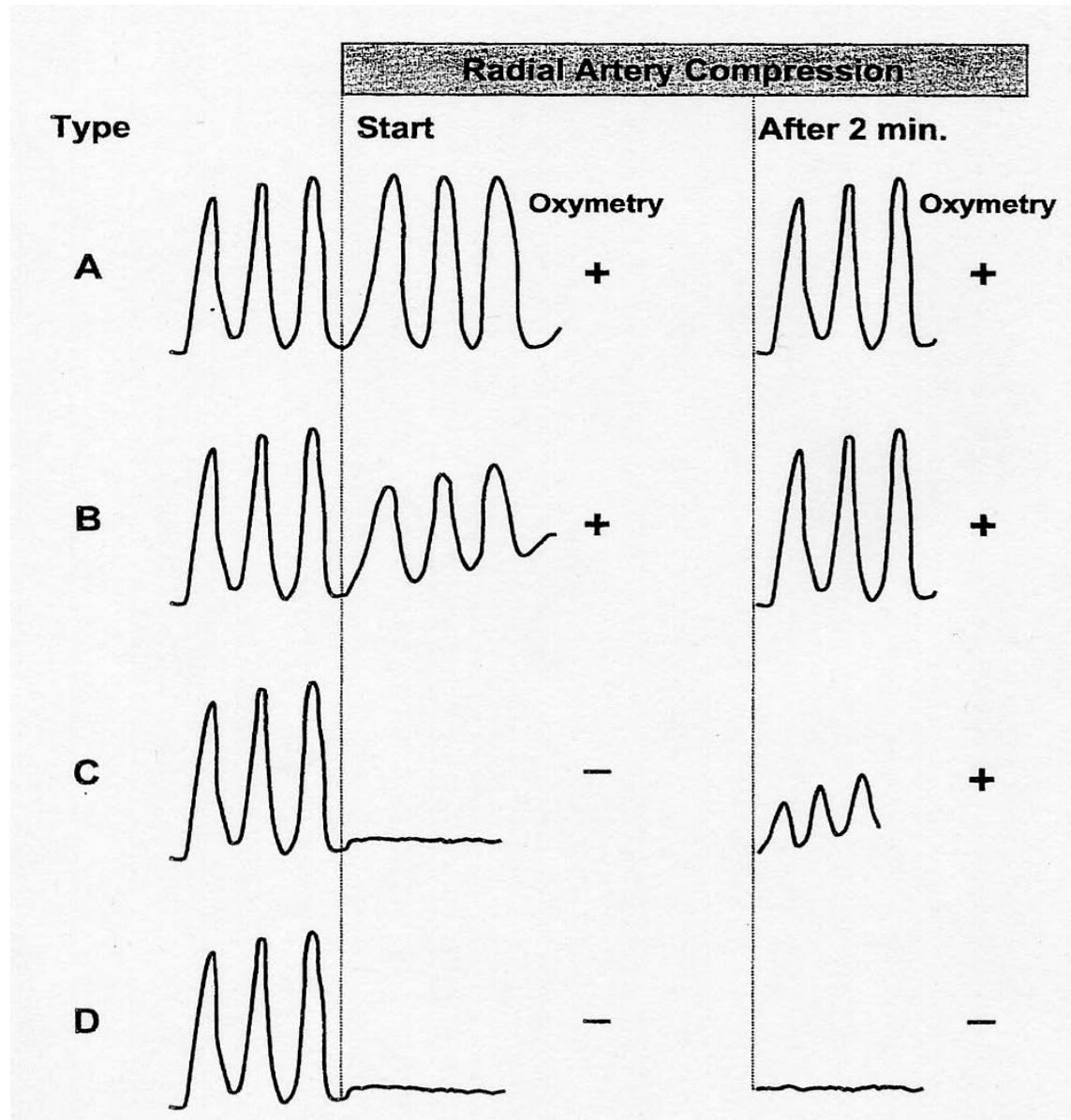
Step 1

Step 2



Step 3

Barbeau test results





Patient preparation

Before the cathlab

Patient's information

Premedication: hydroxyzine dichlorhydrate

EMLA[®] cream

In the cathlab

Allen test, oxymetry

Local anaesthesia

Anaesthesia? (Remifentanyl)

EMLA cream





Which side?

Right RA

Physician comfort

X-ray exposure

One catheter for both coronary arteries

RIMA

Left RA

Less easy for the physician

More X-ray exposure

2 catheters

Less sub-clavian loops

Easier ostia cannulation

LIMA



Patient preparation - summary

To check palmar arch: Barbeau's test only

EMLA[®] cream and subcutaneous lidocaine

Left radial more useful, but less comfortable

Fixed wrist with hyperextension

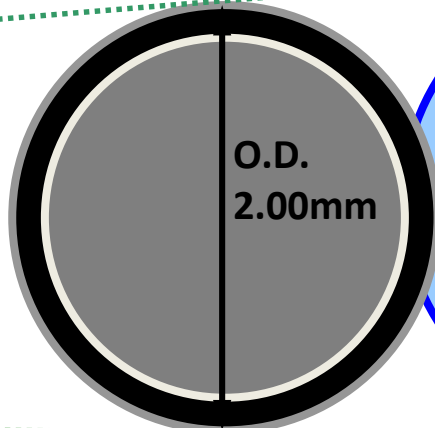
Puncture site: 2-3cm above flexor crease

Puncture kit with venous canula

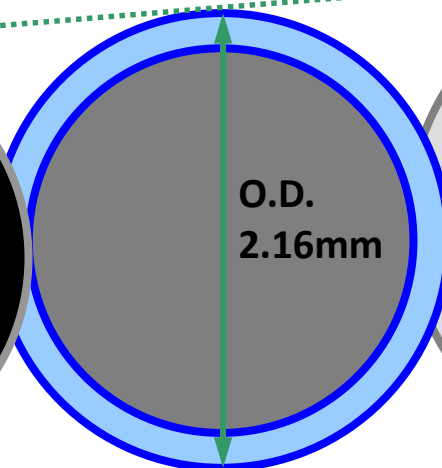


3. 20. 2002

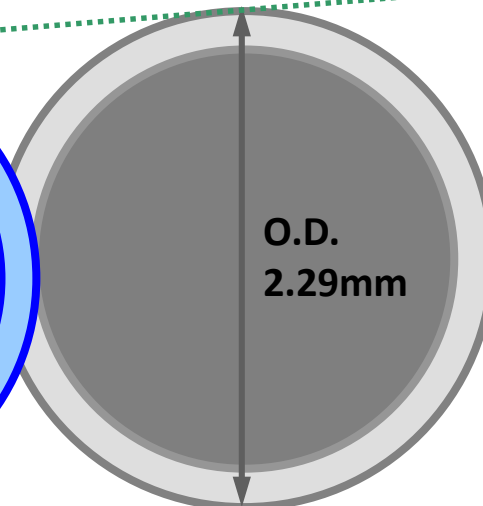
6.5Fr



4Fr Sheath Introducer

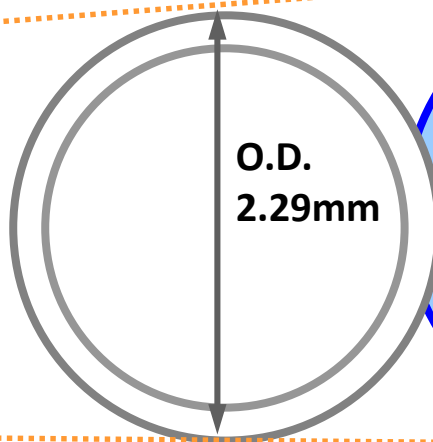


6.5Fr / 0.058"
SheathLess

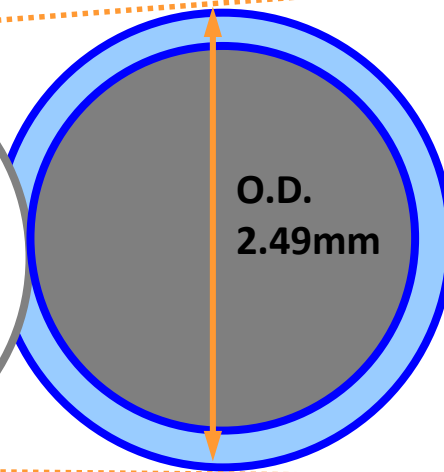


5Fr Sheath Introducer

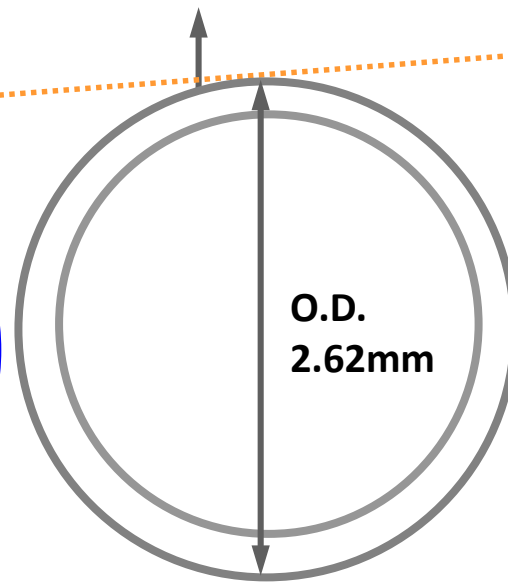
7.5Fr



5Fr Sheath Introducer

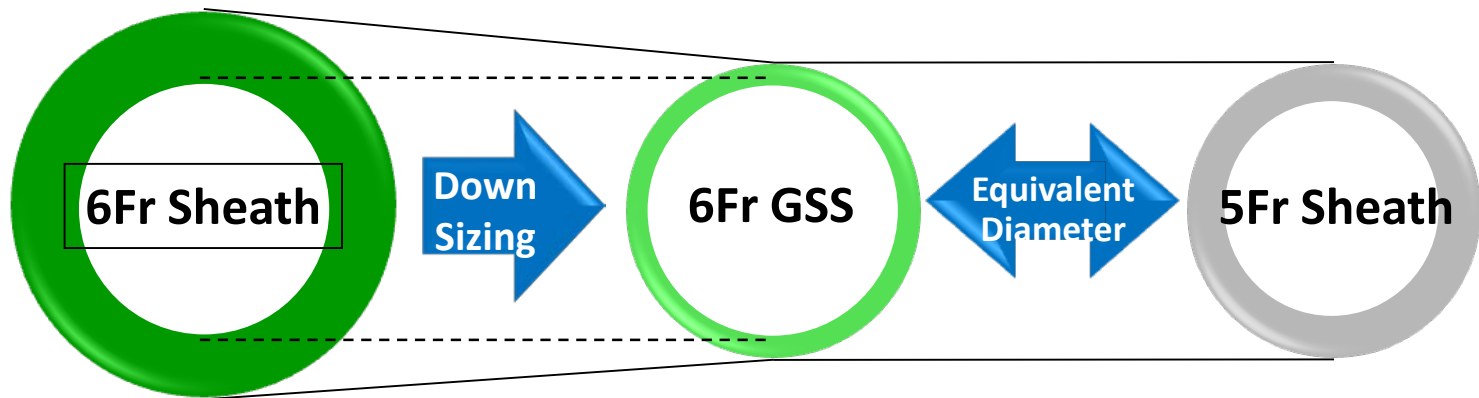


7.5Fr / 0.070"
SheathLess



6Fr Sheath Introducer

Another solution: Slender® technique



5-in-4

6-in-5

7-in-6



Glidesheath Slender®

Hydrophilic Coated Introducer Sheath



Equivalent
lumen



Equivalent
outer diameter



Equivalent
lumen



Equivalent
outer diameter



Equivalent
lumen



Equivalent
outer diameter



Slender technology:

- Allows 1Fr size reduction in outer diameter
- Maintains larger inner lumen diameter
- Reduce the need to upsize to a larger sheath



Specific hardware -summary

Low-profile sheath with venous cannula or bare-metal needle

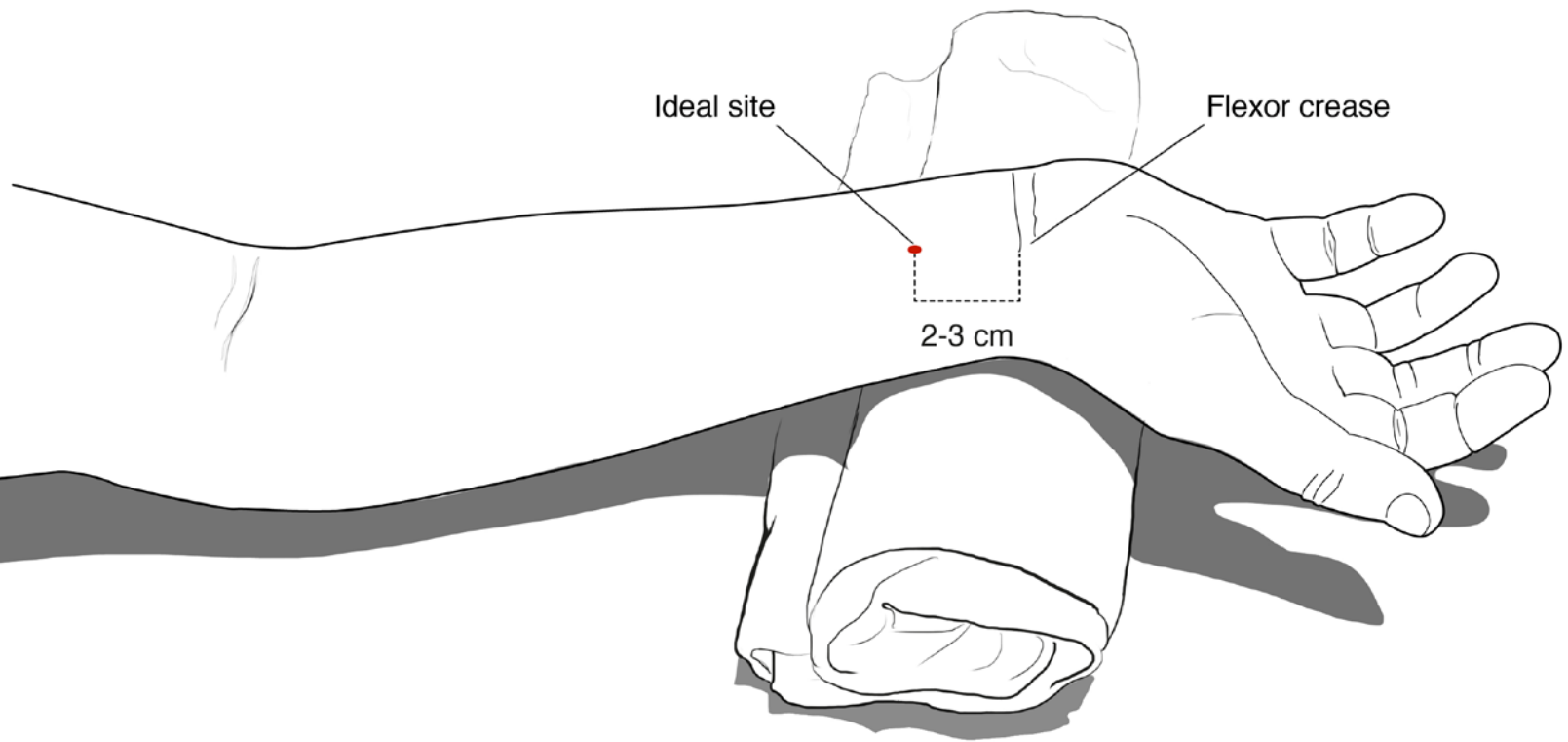
Slender[®] hydro coating sheath

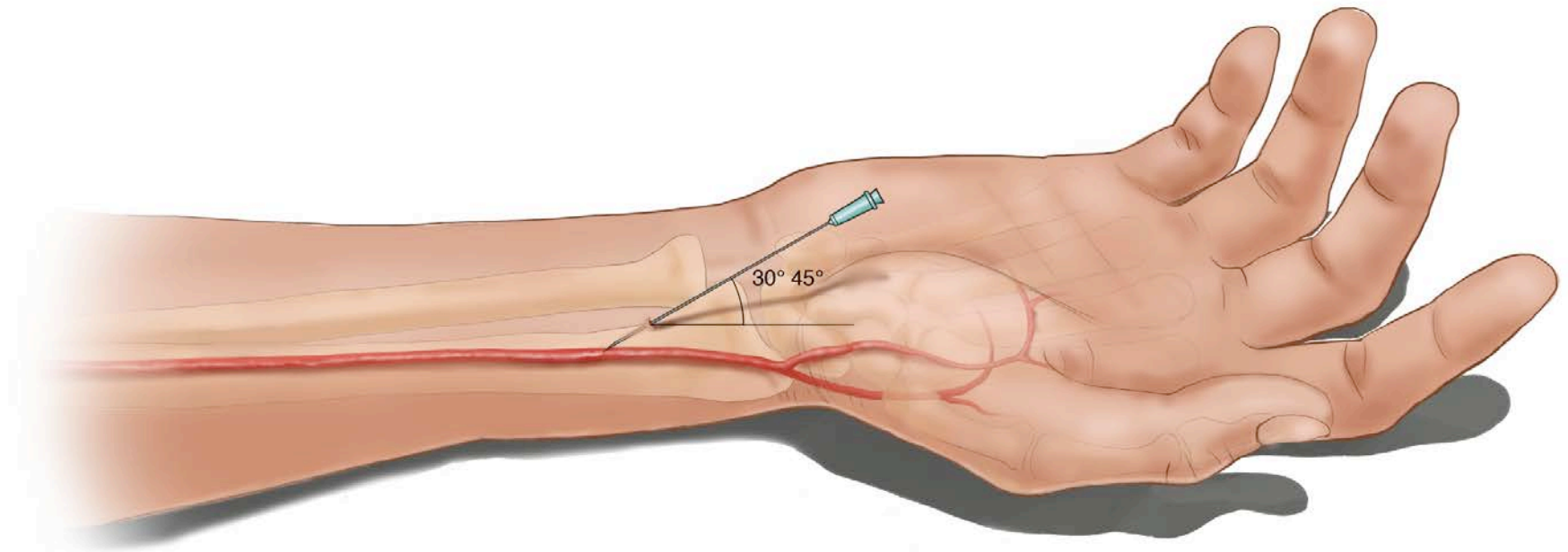
Standard and hydrophilic 0.035'' wire

Sheathless catheter

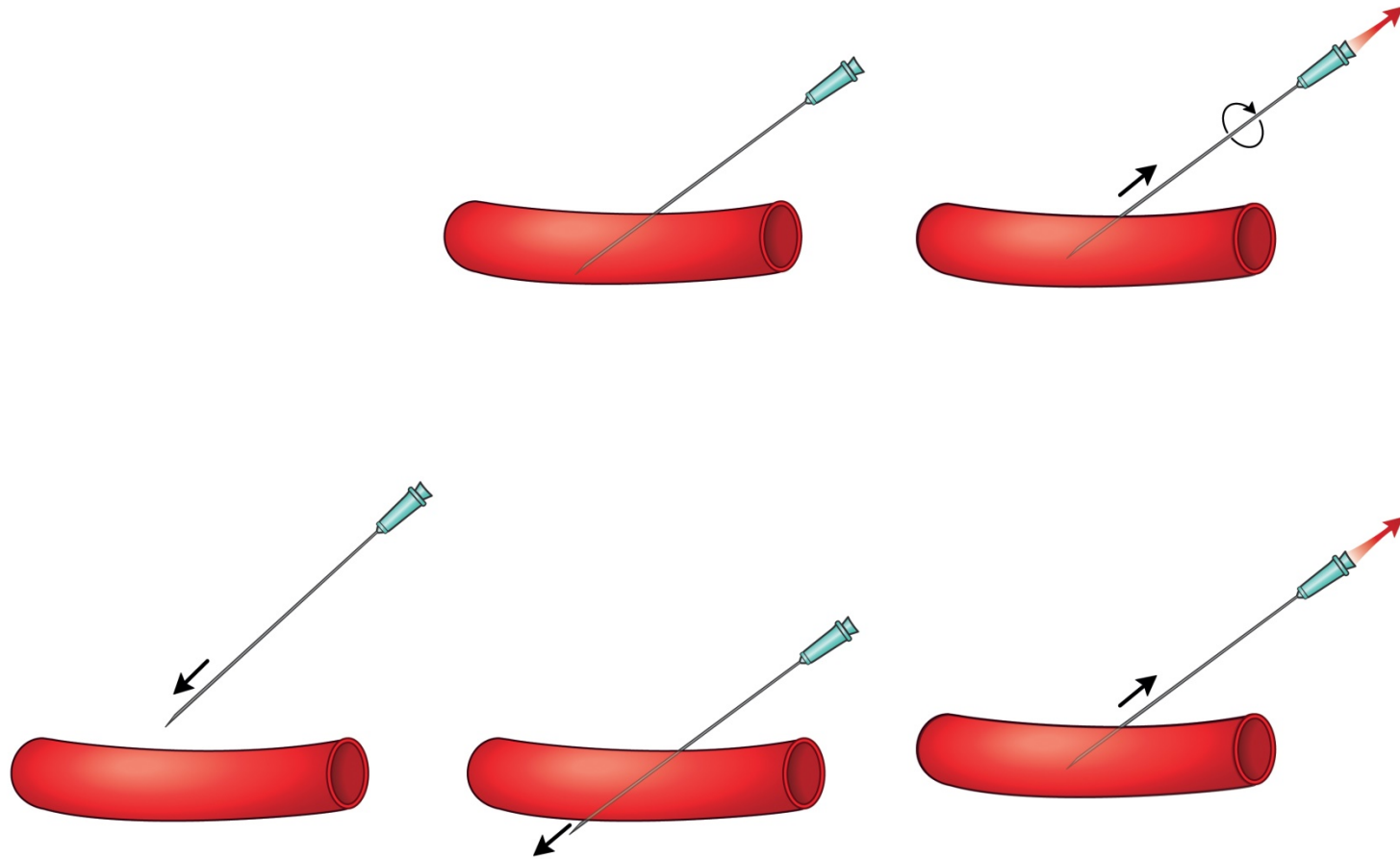
Closure device

Ideal puncture site





Puncture techniques





A good flow, but the wire doesn't advance

Never force

Perform a J to the wire or use a J specific wire

Needle rotation

Cannulation with venous needle and inject contrast to understand

New puncture higher



Management of the radial spasm

Injection of Verapamil and nitrates

Adequate sedation

Induction of reactive hyperaemia

Vasodilator

Verapamil: 2.5 mg

Nitro: 100 µg

Diltiazem: 5 mg

UHF

Diagnostic: 50 UI/kg

PCI: 70-100 UI/kg



Puncture - summary

Local anaesthesiology with subcutaneous needle

Puncture with an 30-45° angle

Transfixant or not, doesn't matter

Advance wire only if a good flow

Use a cocktail (vasodilator and heparin)



TR Band

Radial artery compression device

COMPRESSION

SELECTIVE

to allow venous blood return and preserve patency.

TRANSPARENT

for visual control of puncture site.

COMFORTABLE

and kind to patients, to enable early ambulation.



Optimal use of TR Band device

Right position of the device (green marker 1cm above skin puncture)

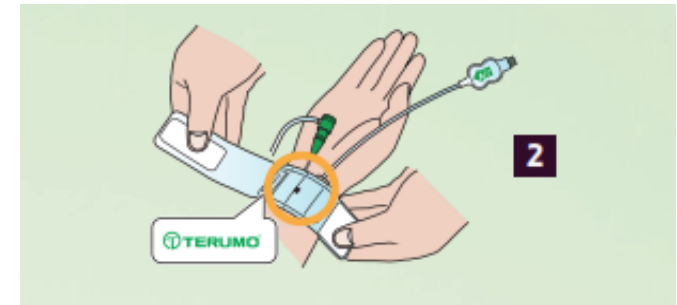
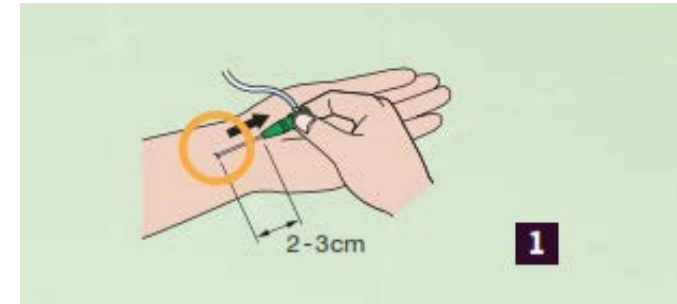
15cc air inflation

Decrease air pressure until bleeding

Inflate again 1cc or 2cc air

HOW TO USE THE TR BAND? (1-2)

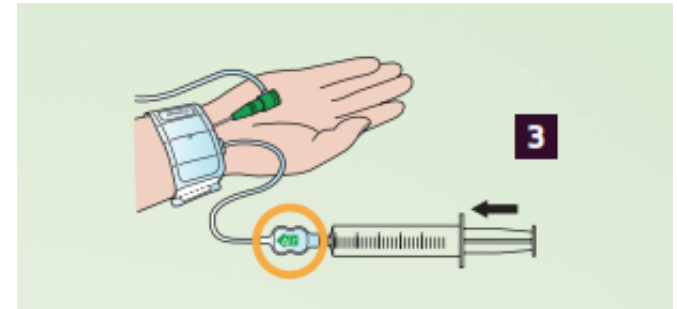
1. After procedure, **WITHDRAW** the sheath by 2-3cm.
2. **ALIGN** the green marker 0.5-1cm up to the skin puncture site and fix the belt on the wrist with the adjustable fastener. Make sure the fastener is stable and note slanted.



HOW TO USE THE TR BAND? (3)

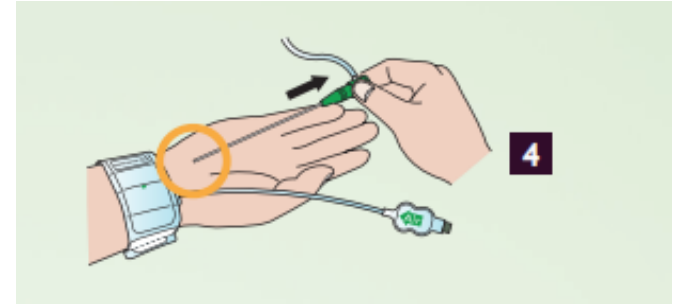
3. To **INFLATE** the compression balloon, inject 15ml of air using the TR Band inflator, which is included in the kit.

After injection, quickly remove the syringe and be sure to control the plunger in order to avoid air being forced back into the syringe.



HOW TO USE THE TR BAND? (4)

4. **REMOVE** the sheath and confirm that there is no bleeding from the puncture site.
5. **DECREASE** air volume ml by ml until bleeding appears and inflate again 1 or 2ml (patent haemostasis technique). If bleeding is observed, inject more air (not exceeding a total of 18ml) until it stops.

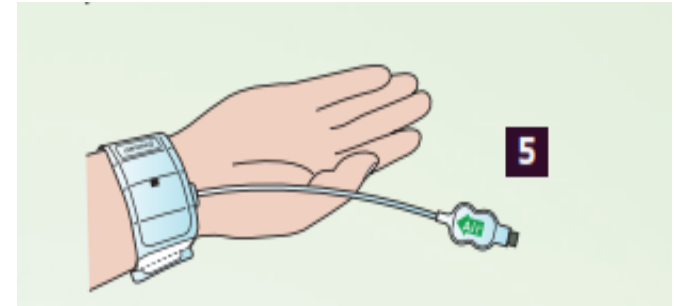


HOW TO USE THE TR BAND? (5)

5. **CHECK** the progress of haemostasis and decrease gradually over the time the air pressure of the balloon with Band inflator until to remove the system (2 hours after coronary angiogram and 3 hours after PCI).

If patient complains of pain: confirm there is no bleeding and remove an appropriate volume of air with the TR Band inflator.

If bleeding occurs: inject more air until it stops (not exceeding a total of 18ml).



1. Rathore S. et al., 2010. A randomized comparison of TR band and radistop haemostatic compression devices after transradial coronary intervention. Catheterization and cardiovascular Interventions, 76(5), pp. 660-667.
2. Wagle & Brindis 2013. From Femoral to radial: An ongoing paradigm shift. Cardiac Interventions Today, July/August 2013.



Haemostasis - summary

Last step but essential to prevent radial artery occlusion

Several devices

Achieve radial patent flow haemostasis without bleeding

As short as possible



Potential factors of radial occlusion

Sheath profile

Ratio artery / sheath

Anticoagulation

Compression:

Duration

Complete occlusive compression