IVUS-GUIDED PCI · QUICK REFERENCE

# The IVUS optimization algorithm

Plan, prepare, size, deploy, check, fix: six steps for every IVUS-guided stent, with the targets to aim for.

## 1 Six steps, every case

Run the pre-PCI pullback before choosing a balloon, and finish every procedure with a final pullback.

| | STEP | ASK | DO |
|---|---|---|---|
| 1 | **Plan** Pre-PCI pullback | How big? How long? What is in the way? Which branches? | Distal reference sets diameter · landing zones with plaque burden < 50% set length |
| 2 | **Prepare** Calcium and plaque | Calcium > 180° arc, > 5 mm long or > 0.5 mm thick? IVUS calcium score 4? | Modify first, then image again (look for calcium fracture) |
| 3 | **Size** Diameter and taper | Landing in plaque? Long, tapering vessel? | Lumen-based: round up ≤ 0.25 mm · Vessel-based: mean EEM, round down · post-dilate proximally (mid-wall) |
| 4 | **Deploy** Stent and POT | Bifurcation? | POT in every bifurcation · respect the platform's maximum expansion |
| 5 | **Check** Final pullback | Expansion · edges · geographic miss · apposition · protrusion | Expansion first |
| 6 | **Fix** Then image again | What failed? | Fix it, then repeat the pullback: the final IVUS run is the last step |

## 2 Expansion targets

Pick one standard for your lab.

| SEGMENT | TARGET | SOURCE |
|---|---|---|
| **Non-left-main** | MSA > 5.5 mm² (OCT > 4.5) or > 80% of mean reference lumen | EAPCI 2018 |
| **Non-left-main** | MSA > 5.0 mm² or ≥ 90% of distal reference lumen | ULTIMATE 2018 |
| **Left main** | MSA ≥ 10 mm² · relative 80–90% of reference lumen | LM consensus 2026 |
| **Ostial LAD · LCx** | MSA ≥ 7 · ≥ 6 mm² | DKCRUSH VIII |
| **LM, Asian data** | Prox LM 8 · POC 7 · LAD 6 · LCx 5 mm² | Kang 2011 |

## 3 Finding → fix

Then image again.

| FINDING | USUAL FIX |
|---|---|
| **Underexpansion** | High-pressure NC balloon; if calcium resists, go back to preparation |
| **Malapposition > 0.4 mm over > 1 mm** | Larger NC balloon (below 0.4 mm: leave it) |
| **Edge dissection > 60°, into media, > 3 mm** | Additional stent |
| **Edge plaque burden ≥ 50% or geographic miss** | Extend coverage |
| **Stent deformation (bifurcation)** | Re-POT, check wire position |

**Remember:** the benefit of IVUS comes from stents that meet the targets. In the big trials only about half did. Expansion first; apposition matters mostly when it comes with underexpansion.

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For education only. Sources: Räber et al., EAPCI consensus 2018; Zhang et al., ULTIMATE, JACC 2018; Johnson et al., Intracoronary imaging for left main PCI, Eur Heart J 2026; Kang et al. 2011; DKCRUSH VIII 2026. Check the original documents and device instructions for use.

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