EAPCI 2018 Expert Consensus Document on Clinical Use of Intracoronary Imaging

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EAPCI Scientific Document Committee
Robert Byrne, MD
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Motivation

- The **clinical use** of intracoronary imaging is **widely variable** among countries, institutions and operators.
- The clinical use remains disappointing.
- The existing international consensus/expert documents are dated back some years, dealing also with obsolete technologies (ie TD-OCT), and do not target the clinical use.
Scopes and Objectives

• To identify areas where the use of imaging is more supported by the existing literature

• To promote the adoption of reasonable criteria (standardization, interpretation) for clinical use of intracoronary imaging, based on the available evidence and best practice.

• To clarify the contribution/limitation of each technique in distinct clinical settings
Current Use of Intracoronary Imaging in Interventional Practice
— Results of a European Association of Percutaneous Cardiovascular Interventions (EAPCI) and Japanese Association of Cardiovascular Interventions and Therapeutics (CVIT) Clinical Practice Survey —

Current use of intracoronary imaging in interventional practice – Results of a European Association of Percutaneous Cardiovascular Interventions (EAPCI) and Japanese Association of Cardiovascular Interventions and Therapeutics (CVIT) Clinical Practice Survey

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Web-based survey by the EAPCI and CVIT

Time frame: June 05 – July 08, 2017

23 questions included:

i. General information
ii. IC imaging for PCI guidance / optimization
iii. IC imaging for native atherosclerosis

Total of 1,105 responses received
In your opinion, what are the **clinical indications** for IVUS or OCT?
Do you believe that IVUS- or OCT-guidance for coronary interventions improves **clinical outcomes** compared with angiography-only guidance?

![Bar chart showing proportions of respondents](chart-image)
What are potential factors **limiting the use** of intracoronary imaging in clinical practice?

- **High cost**
  - Japanese: 57%
  - European: 78%

- **Prolongation of procedure**
  - Japanese: 23%
  - European: 53%

- **Lack of training**
  - <5y experience: 31%
  - >5y experience: 16%
Task Force Members

- Antonio Colombo, MD
- Carlo Di Mario, MD
- Javier Escaned, MD
- Giulio Guagliumi, MD
- Jose’ de la Torre Hernandez, MD
- Jonathan Hill, MD
- Neils R. Holms, MD
- Haibo Jia, MD
- Tom Johnson, MD
- Micheal Joner, MD
- Kostantinos Koskinas, MD
- Nicolas Meneveau, MD
- Gary Mintz, MD
- Yoshi Onuma, MD
- Francesco Prati, MD
- Lorenz Räber, MD
- Maria Radu, MD
- Evelyn Regar, MD
- Bo Yu, MD
- William Wijns, MD
Core element #1

“We want to have credible messages and recommendations transmitted to all interventionalists.”

“The committee is great fun but all members are proselytes of invasive imaging”

WW
EAPCI Scientific Document

Global participation and possibly co-sharing (partnership with other scientific societies)

Scientific documents are reviewed by a panel of reviewers nominated by the SDC of the EAPCI.

- **Review Coordinator: P. Serruys**

- Highly recognized experts in intracoronary imaging from different geographic areas, to guarantee an objective and challenging evaluation of the Consensus documents
  - Europe
  - Japan
  - USA
Core element # 2

• **Which lesion merit imaging?** Link the use to a certain level of anatomic and/or patient complexity (LMCA, long lesions, CTO, ACS). Preferred modality based on clinical situation, level of evidence

• **Few clinically relevant questions** where coronary angiography has limitations during diagnostic evaluation (angiographic ambiguity), PCI (pre and post), and at urgent and emerging procedure in FU (stent failure)

• **Safety of ic imaging** (extra-time, amount of contrast, dissection, distal plaque embolization). Data reported for stable indications and lesion at risk of events

• **What should be measured?** Accuracy of relevant measures.
Methods

The document takes into consideration:

- **Available Peer Review literature** - RCT, meta-analyses, registries
  Much of the beneficial impact of IC imaging is based on meta-analyses of pooled trials rather than individual trials

- **Existing Guidelines** (upcoming novel ESC guidelines- August 2018)

- Each recommendation **based on evidence (existing data) but also on the best clinical practice**
Decision made at the kick-off meeting
ESC 2017

- **Series** of documents

- **To start with the most relevant clinic topic: stent guidance/optimization/failure**, considering the amount of existing data, more clinical evidence, and the top position preference for clinical use expressed by the real world - EAPCI-CVIT Survey

- **Following script**: high-risk lesion identification and treatment, role of imaging in ambiguous angiography.
Themes Core Groups

• Core Groups are working simultaneously on different themes *(series of documents)*

• Tables and Figures are relevant to this Document

• Summary of indications in clinical practice: *box synthesis*
1. Does intracoronary imaging improve clinical outcomes following PCI?

2. Which patients and lesions should be considered for intracoronary imaging during PCI?

3. How to perform intracoronary imaging and which criteria should be used for stent implantation and optimization with IVUS and OCT?

4. Assessment of mechanisms of stent failure

5. Potential limitations of intravascular imaging
<table>
<thead>
<tr>
<th>Meneveau Nicolas</th>
<th>In the DOCTORS study, the optimal cut-off value of MSA to predict FFR&gt;0.90 was &gt;5.44 mm², while the optimal cut-off value of stent expansion to predict FFR&gt;0.90 was &gt;79.4%.</th>
<th>This paragraph was integrated adapted</th>
</tr>
</thead>
<tbody>
<tr>
<td>NM</td>
<td>Sentence is unclear, it is my understanding that malapposition has not been shown to be of relevance by IVUS</td>
<td>Sentence was deleted adapted</td>
</tr>
<tr>
<td>Wijn William</td>
<td>Not sure about what you wish the content of the boxes to be: is it a summary of the hard “evidence”? – or a summary of the previous chapter? – or a list of the gaps in evidence? – or a mix of consensus statements plus hypotheses to be tested? I mean: I found all remarks in the boxes of great interest, but right now, they are all over the place. I think we should be clear about what the reader will find there.</td>
<td>These are the summary of the key points of the chapter. adapted</td>
</tr>
<tr>
<td>WW</td>
<td>I am delighted that you did not include a discussion of imaging as a metric for hemodynamic significance, as opposed to- or in comparison with physiology. I support this 100%. This simply does not merit its place under “guidance and optimization”.</td>
<td>This will make part of the second manuscript Leave as is</td>
</tr>
<tr>
<td>WW</td>
<td>The sections on biodegradable scaffolds are too long: few were using them in the past (175.000 vs millions of DES), nearly nobody is using them today. They belong in the research basket, and yes, imaging is key, but who No other consensus member regarded the chapter as too long and the oral discussion at ESC and TCT were also in favor of Leave as is</td>
<td></td>
</tr>
</tbody>
</table>
Box 3: Stent sizing by intracoronary imaging

- The beneficial effect of imaging-guided PCI does not appear to be strictly linked to the algorithm used for stent sizing by IVUS or OCT.

- From a practical standpoint, a distal lumen reference based approach may represent a safe and straightforward approach with subsequent optimization of the mid and proximal stent segments. Specifically, the mean distal lumen diameter (2 orthogonal measurements) with up rounding stent (0-0.25mm) may be used (e.g. 3.76mm->4.0mm), or the mean EEM (2 orthogonal measurements) with down rounding to the nearest 0.25mm stent size (e.g. 3.76mm->3.5mm)

- When using OCT, an EEM reference based sizing strategy appears feasible, although more challenging than a lumen based approach for routine clinical practice.
REVIEWER #3

Comment 5: It would be helpful to the readers to point out that while imaging guided PCI to achieve a pre-specified target expansion is not always achievable, it does guide the operator to try and achieve this goal, potentially increasing MSA which is tied to the benefit of imaging guidance. Sensibly, this should be tied to figure 2.

Response: We thank the Reviewer for this observation and added the following revision in response to this comment (page 6 of the revised manuscript):

“Notably, the pooled benefit emerged despite the fact that pre-defined stent optimization targets were not reached in many of the enrolled patients (Figure 2). It should also be noted that, although pre-specified expansion targets in imaging-guided PCI are not always achievable, it is reasonable to assume that these targets do guide operators in attempting to achieve the goals and potentially result in increasing MSA. Whether a higher rate of acute procedural optimization or alternative optimization targets might result in an incremental improvement in clinical outcomes is unclear.”
Clinical use of intracoronary imaging.

Part 1: Guidance and optimization of coronary interventions. An expert consensus document of the European Association of Percutaneous Cardiovascular Interventions Endorsed by the Chinese Society of Cardiology

Lorenz Räber, Gary S Mintz, Konstantinos C. Koskinas, Thomas W Johnson, Niels R Holm, Yoshinubo Onuma, Maria D. Radu, Michael Joner, Bo Yu, Haibo Jia, Nicolas Menevau, Jose M. de la Torre Hernandez, Javier Escaned, Jonathan Hill, Francesco Prati, Antonio Colombo, Carlo di Mario, Evelyn Regar, Davide Capodanno, William Wijns, Robert A. Byrne, Giulio Guagliumi
Actionable Imaging Features

“We urge the team of imaging experts to teach the community at large exactly what every cardiologist should know, basically the content of the boxes in the article.

I also expect you and the team to spend the necessary time on making sure each and every participant receives as a gift the required skills so that they become proficient in recognizing and measuring what is needed to make the correct diagnosis and take the appropriate action.”

Message received from EuroPCR Board April 18 2018
**Expert Consensus Documents** should be regarded as educational tools that help physicians formulate their clinical judgments and make independent diagnostic and therapeutic choices.

Such documents supplement guidance and evidence produced in Clinical Practice Guidelines by covering areas not specifically addressed or not addressed in detail by existing ESC Guidelines.

**Recommendations** can be part of scientific documents. They should be based on the available evidence.