PHILIPS

Image guided therapy

Azurion

PCI suite

Transforming complex PCI procedures into confident care



Coronary Tools

PERFORMANCE,

Table in ROL position

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PHILIPS CORONARY TOOLS



A unique cardiovascular offering across the entire care continuum

So what is PCI suite and how can it change the way you treat?

The world of Interventional Cardiology is evolving rapidly. What worked for you yesterday may not be right for you today. New technologies and devices are continually adding complexities to your already complex procedures.

All the while you have to make sure you're providing the most advanced treatment options available with the least amount of contrast and radiation.

Enter the Philips PCI suite, part of our overall Clinical Suites solutions. It combines innovative and proven legacy technologies from Philips Volcano across the entire care continuum to support PCI procedures and intra coronary device techniques. Our PCI suite offers you cutting-edge innovations including various iFR/FFR coregistration technologies moving physiology from justification to physiology guidance. And real-time navigation guidance aids you in placing devices in the right position while providing confident confirmation of results. Not to mention, in cardiac cine, ClarityIQ technology reduces patient dose by 53% while maintaining equivalent image quality, compared to a system without ClarityIQ.¹

Research shows that advances in imaging technologies and techniques have increased success rates and safety when performing complex procedures, with the potential to be cost effective.²

CTO procedures: Angiographic success rates and major procedural complication rates²



Image guided therapy solutions to help you decide, guide, treat and confirm



PCI suite powered by Azurion **Performance and superior care become one**

The bigger field size* on 12" detector is perfect for navigating towards the coronaries and for left ventricle imaging. You can also see bigger parts of the aorta with this detector size³."

> **Dr. Joachim Sternvall,** TAYS Heart Hospital, Helsinki, Finland



PHILIPS 12" detector High-resolution Polv-G arm imaging over a large field State of the art, of view with full projection geometry designed flexibility, particularly for PCI procedures beneficial in cardiac interventions. Instant Parallel Working Perfom tasks independently during fluoroscopy or exposure

* compared to 10" detector

Xper Flex Cardio Enhance cardiovascular assessment through live patient monitoring

ClarityIQ technology In cardiac cine, ClarityIQ technology reduces patient dose by 53% while maintaining equivalent image quality, compared to a system without ClarityIQ¹

2D-QA Measurements for comprehensive diagnosis, decision making, planning, and evaluation of 11-cardiovascular P 4 20 10 procedures © last in this personal Let Cooway 10.11 1.00 **PCI** Applications terr 35 Live tools aiding Teat Pass and PCI procedures • 123 M

FlexVision Pro & Touch Screen Module Pro Full control at table side, with tablet ease Volcano Integration Store and export IVUS, iFR, SyncVision images in the same patient file as the X-ray data.⁴

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6

PCI solutions to simplify your workflow and enhance patient care



Efficient diagnostic acquisition

CardiacSwing of LCA and RCA gives an overview of the coronary vasculature, providing additional anatomical insights with lower radiation and contrast.^{5.6}



Quick measurements of lesions

2D-QA measures lesion stenosis on an angiogram during the procedure, now possible to do in parallel to fluoroscopy with Instant Parallel Working.

Decide



Guiding the intervention

IVUS co-registration on SyncVision to obtain vessel lumen insights, and identify landing zones, stent diameter, and length selection.

Guide



Guiding through the intervention

Dynamic Coronary Roadmap provides live image guidance to position the guidewire distal to the lesion.



Express physiological measurements

iFR Roadmap, co-registration of the iFR physiological measurement in relation to its anatomical location on the X-ray image, during the decide stage of the procedure.

0.89 iFR cut-point, backed by data^{7,8}

iFR Modality iFR ≤ 0.	0.89	
	iFR ≤ 0.89 Treat	iFR > 0.89 Defer
0.7	0.8	0.9 1.0



Advanced physiological measurements

SyncVision iFR co-registration can be used when the lesions are more complex and advanced insights are required, mapping the physiology gradients onto the angiogram.

The clinician can use this value in combination with other factors specific to patient's condition to determine treatment necessity and options.



Pre-Stenting evaluation

During positioning, **StentBoost Live** enhances live stent visualization to verify lesion coverage.





Post intervention physiological measurement

Post-stenting evaluation with **iFR Roadmap** confirms the result of the intervention.

Confirm



Post-Stenting evaluation

After deployment, **StentBoost Live** in real-time visualizes positioning and integrity of the stent.





Post intervention advanced imaging solutions

SyncVision **iFR Co-registration** and **IVUS co-registration** can be used to identify the result of the intervention and to verify whether additional treatment is needed.



Needless to say, seeing better can make your job a whole lot easier. Dynamic Coronary Roadmap, a Philips-exclusive technology, creates a motioncompensated, real-time view of coronary arteries. A highlighted coronary angiogram is superimposed on a live 2D fluoroscopic image, creating a colored roadmap that adjusts automatically, providing continuous visual feedback on positioning of wires and catheters.

It's also fully integrated with the system and features automatic storage and easy re-display of previously acquired roadmaps to enhance procedure efficiency without changing current workflow.

How **Dynamic Coronary Roadmap** benefits you:

- Real-time, automatic, motion-compensated coronary imaging for easier image guidance
- Store and easily re-display previously acquired roadmaps to enhance procedure efficiency
- Integrates seamlessly into standard of care
 workflow and daily clinical practice

One of the most common complications of PCI is acute kidney injury (AKI), primarily induced by the use of nephrotoxic contrast medium. PCI patients who develop AKI have an increased risk for complications, length of stay, and additional acute care costs.⁹ The above graph is reproduced from data presented by Brown et al.⁹ The results of this study show that contrast medium reduction should be a priority in today's PCI procedures.

Need for contrast load reduction in PCI procedures



Angioplasty of LAD with bifurcation lesion



A severe lesion is located at the mid-portion of the LAD, immediately distal to a large diagonal branch. Because of the complicated location of the lesion, the guide wire tracks down the diagonal branch instead of the LAD. Anchoring the wire in the LAD is required to provide enough stability to cross the lesion with the stent. With Dynamic Coronary Roadmap, you can retrieve and selectively advance the wire to the targeted vessel, in this case, without requiring additional contrast test injections.

StentBoost Live

To help save lives, you have to see live

Accuracy is everything in your job. And the fact that stents are getting harder to see doesn't help. Today's StentBoost Live* builds on a decade-long legacy of innovation and experience by offering Philips' most advanced live stent visualization technology yet. It quickly helps you verify positioning before and after deploying balloons, stents, and intra-coronary devices to display underdeployment and confirm full expansion. And it's all done in real-time, eliminating the need for waiting on new images before you reposition the stent.



* 5th generation of Philips StentBoost application. For more information please visit www.philips.com/stentboostlive

How **StentBoost Live** benefits you:

- Live enhanced visualization of device
 positioning and deployment in real-time
- Designed for procedural effectiveness and greater efficiency with enhanced visualization of moving intra-coronary devices
- Seamless integration into standard of care
 workflow for optimized PCI

66 StentBoost Live enables fast and efficient placements of multiple stents and achieves the right amount of overlap – or avoids overlap in case of BVS."¹⁰

According to the personal opinion of **Dr. B. Drieghe,** Interventional Cardiology and Electrophysiology, University Hospital Gent, Gent, Belgium

Post-stenting balloon dilation with a high pressure balloon



To avoid vessel injuries, a high-pressure balloon must be accurately placed within a stent. However, advances in stent design have made visualization of struts and stent edges more difficult, creating a challenge for accurate balloon placement. StentBoost Live is used to visually guide the high-pressure balloon to the proximal end of the stent. Continuous stent visualization shows the placement of the balloon fully within the stent.

Co-registration

Over the last few years, co-registration technologies have improved tremendously, now allowing for more accurate and real-time mapping of live images and functional data. Not only does this technology help you determine the appropriate therapeutic approach, it lets you deliver treatment with more confidence. Not to mention, improve patient care.

Philips offers a variety of co-registration solutions depending upon the needs of your cath lab, so you're ensured smooth integration in your PCI workflow.

iFR Distal 0.78

Proven outcomes from the **DEFINE FLAIR and iFR Swedeheart studies**^{7,8}

Patient outcome data from the DEFINE FLAIR and iFR Swedeheart trials, demonstrated that, compared to an FFR-guided strategy, an iFR-guided strategy offers a more cost-effective and faster diagnostic solution with significantly reduced patient discomfort, while delivering consistent patient outcomes.

These studies included 4,529 patients and represent the largest randomized coronary physiology outcome studies to date.

Less procedural time



DEFINE FLAIR procedural time: 40.5 minutes (iFR arm) vs. 45.0 minutes (FFR arm) (p<0.001)

Consistent patient outcomes using iFR guided strategy, as FFR



* p-values are for non-inferiority of an iFR-guided strategy versus an FFR-guided strategy with respect to 1-year MACE rates; pre-specified non-inferiority margins were 3.4% and 3.2% in DEFINE FLAIR and iFR Swedeheart, respectively

Reduced patient discomfort



DEFINE FLAIR reported a **90% reduction** in patient discomfort

r, respectively scomfort p = < 0.0001



iFR Swedeheart reported that with no hyperemic agent, you can achieve a **95.7% reduction** in patient discomfort using an iFR-guided strategy

Proven outcomes



Published in **The New** England Journal of Medicine

Philips exclusive **co-registration technologies**

iFR Roadmap

Express iFR co-registration guides you to make your decisions

iFR Roadmap, a Philips exclusive technology and an extension of Dynamic Coronary Roadmap¹¹, provides an automated, real-time, co-registration of the iFR physiological measurement with its anatomical location on the Dynamic Coronary Roadmap. Using the Philips Volcano Verrata/Verrata Plus pressure wires, you can easily integrate iFR measurements into your daily PCI routines¹². That means enhancing workflow in iFR pullback, FFR spot measurements, and providing data of your treatment decisions.

How iFR Roadmap benefits you:

- Real-time co-registration on one screen for enhanced workflow
- Post-measurement review of physiological data for lesion assessment and confident treatment decisions
- Capture and storage of the iFR/FFR evidence, including facilitated transfer to PACS/DICOM

iFR Roadmap during pullback



1. The initial distal iFR measurement of 0.82 provides an indication of the significance of the lesion.



2. The pressure wire passed the mid LAD showing a first pressure drop due to the myocardial bridging and a borderline measurement of 0.89 iFR.



3. The final iFR measurement equalized to 1.0 once it crossed the lesion seen in the proximal LAD.

Choose from a broad portfolio of **co-registration technologies**

SyncVision

Advanced Imaging Solutions

SyncVision package in concert with CORE IVUS and physiology provides an advanced imaging solution designed to address imaging and physiological challenges in the cath lab.

It allows you to streamline lesion assessment, simplify vessel sizing, and support precise therapy delivery. Simply put, that means more confidence for you and better care for your patients.

How SyncVision benefits you:

- iFR Co-registration maps physiological gradients onto the anatomy to plan your procedure, provides precise lesion severity and location
- iFR Co-registration allows length measurements without the need for a cumbersome pullback device
- IVUS Co-registration localizes the IVUS image on the angiogram
- IVUS Co-registration enables easy length and area measurements with manual IVUS catheter pullback, for accurate stent size selection

Advanced physiologic imaging with SyncVision iFR Co-registration



iFR Co-registration graphically maps the physiology gradients onto the angiogram, to better distinguish focal and diffuse coronary disease, and to guide therapy.¹³

Advanced intravascular imaging with SyncVision IVUS Co-registration



IVUS Co-registration is designed to help reduce the risk of geographic miss, making it easier to identify your 'healthy-to-healthy' landing zones and your stent diameter and length selection.¹⁴

PCI suite

System platform Azurion ClarityIQ, AlluraClarity, Allura Xper

Dedicated PCI Applications

Dynamic Coronary Roadmap iFR Roadmap StentBoost Live CardiacSwing 3DCA CT TrueView

Philips Volcano Devices

CORE Family IVUS iFR/FFR iFR Scout

SyncVision

IVUS co-registration iFR/FFR co-registration

Integrated Tools

IntelliSpace CardioVascular CX50 Xper IM Xper Flex Cardio CORE Integration DoseWise Portal

Other Cardiology Solutions

HeartNavigator EchoNavigator EP Navigator EPIQ Ultrasound (with TEE)

Accessories

Radial access arm board

Dynamic Coronary Roadmap and StentBoost Live compatible with Azurion are not yet CE marked and not yet available for delivery. iFr Roadmap is considered work in progress and is not CE marked and not available for sales. This material is not for use in the United States.

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References

- In cardiac cine, ClarityIQ technology reduces patient dose by 53% while maintaining equivalent image quality, compared to a system without ClarityIQ:
 - The results of the application of dose reduction techniques will vary depending on the clinical task, patient size, anatomical location and clinical practice. The interventional radiologist assisted by a physicist as necessary has to determine the appropriate settings for each specific clinical task.
 - Results based on cine dose area product per frame from a single center prospective study on 39 patients. Cine runs for Allura Xper with ClairtyIQ and Allura Xper without ClairtyIQ were acquired on the same patient under same condition of geometry, field of view and injection protocol. Image quality comparison is based on subjective assessment (side-by-side, score: equal or better than the other, blinded review by 6 independent cardiologists).
 - ten Cate, T., et al., Novel X-ray image noise reduction technology reduces patient radiation dose while maintaining image quality in coronary angiography. Netherlands Heart Journal, 2015. 23(11): p. 525-530.
- Rawlin J. et al. Evidence for Benefit of Percutaneous Coronary Intervention for Chronically Occluded Coronary Arteries (CTO) – Clinical and Health Economic Outcomes. ICR 9 (2014): http://dx.doi.org/10.15420/icr.2014.9.3.190.
- 3. This statement is according to the personal opinion of Dr. Joachim Sternvall, TAYS Heart Hospital, Helsinki, Finland.
- Full integration of Philips Volcano products is only available with CORE Mobile, CORE integrated, or SyncVision and software version Volcano FM SW 2.5 or higher.
- Gómez-Menchero A.E. et al., Comparison of dual-axis rotational coronary angiography (XPERSWING) versus conventional technique in routine practice. Rev Esp Cardiol (Engl Ed). 2012 May;65(5):434–9. doi: 10.1016/j.recesp.2011.12.014. Epub 2012 Apr 1.
- Giuberti R.S. et al., A randomized trial comparing dual axis rotational versus conventional coronary angiography in a population with a high prevalence of coronary artery disease. J Interv Cardiol. 2014 Oct;27(5):456-64. doi: 10.1111/joic.12148. Epub 2014 Aug 18.
- Davies JE, et al., DEFINE-FLAIR: A Multi- Centre, Prospective, International, Randomized, Blinded Comparison of Clinical Outcomes and Cost Efficiencies of iFR and FFR Decision-Making for Physiological Guided Coronary Revascularization. New England Journal of Medicine epub March 18, 2017.
- Gotberg M, et al., Instantaneous Wave-Free Ratio Versus Fractional Flow Reserve Guided Intervention (IFR-SWEDEHEART): A Multicenter, Prospective, Registry-Based Randomized Clinical Trial. New England Journal of Medicine epub March 18, 2017.
- Brown J.R. et al., J Am Heart Assoc. 2016;5: e002739 doi: 10.1161/ JAHA.115.002739.
- This statement is according to the personal opinion of Dr. B. Drieghe, Interventional Cardiology and Electrophysiology, University Hospital Gent, Gent, Belgium.
- 11. iFR Roadmap is not a standalone technology. It can only be purchased as part of the Dynamic Coronary Roadmap package.
- iFR Roadmap is only compatible with Philips Volcano CORE system and Verrata/Verrata Plus pressure wires.
- SyncVision iFR co-registration is compatible with Verrata/Verrata Plus pressure wires.
- 14. SyncVision IVUS co-registration is only compatible with Eagle Eye Platinum IVUS catheters.

