

The SYNTAX Score™

A new angiographic tool to grade the complexity of coronary artery lesions

The SYNTAX Score™ⁱ is a new tool to help researchers, cardiologists and cardiac surgeons grade the complexity of coronary artery disease (CAD). It was first developed for use in the landmark SYNTAX study, a randomised, controlled clinical trial designed to compare percutaneous coronary intervention (PCI) with drug-eluting stentsⁱⁱ to coronary artery bypass graft (CABG) surgery in patients with left main diseaseⁱⁱⁱ and/or significant narrowing of all three coronary arteries (three-vessel disease^{iv}).¹ Results from the SYNTAX trial suggest that clinicians may find the SYNTAX Score to be a useful tool when making clinical decisions.²

“It will be an important tool to assist with revascularisation strategies in these complex patient populations.”

Patrick W. Serruys, MD, PhD

Calculating the SYNTAX Score

The SYNTAX Score is calculated by analysing the answers to 12 questions grading characteristics of the patient's coronary artery disease (CAD).³ The first three questions determine where the CAD lesions are predominantly located – either the left or right branch of the coronary artery – and the numbers of lesions and blood vessel segments involved.


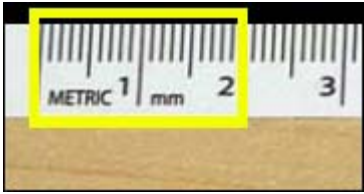
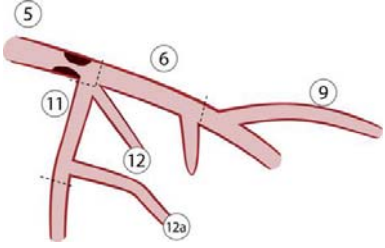

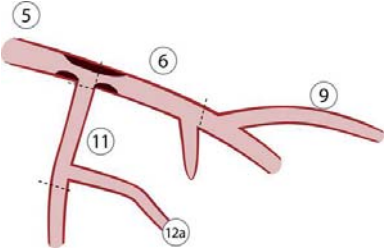
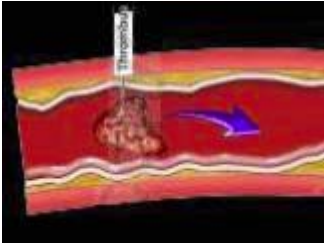
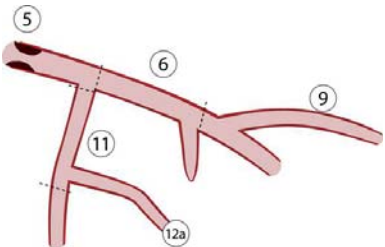

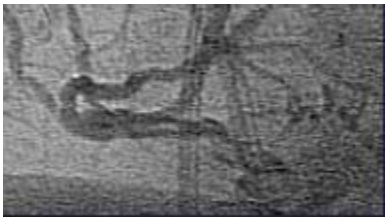
ⁱ The SYNTAX Score and related materials are not intended to provide medical advice or guidance as to appropriate treatment strategies for individual patients. Risks and benefits should be carefully considered for each patient taking into account all available data and treatment options. The SYNTAX Score and related materials were developed under the direction of the SYNTAX Steering Committee, and was made possible by support from Boston Scientific Corporation and Cardialysis BV


ⁱⁱ It is important to note that the safety and effectiveness of drug-eluting stents may have not been established in high-risk patients, and physicians are strongly encouraged to review the indications, contraindications, warnings and instructions included in the products' Directions of Use

ⁱⁱⁱ Isolated or in conjunction with 1, 2, 3 vessel disease

^{iv} Revascularisation for all 3 vascular territories

Grading individual lesions with the SYNTAX Score (questions 4–11)

<p>4. Total occlusion</p> 	<p>9. Length >20 mm</p> 
<p>5. Trifurcation</p> 	<p>10. Heavy calcification</p> 
<p>6. Bifurcation</p> 	<p>11. Thrombus</p> 
<p>7. Aorto Ostial lesion</p> 	<p>12. "Diffuse disease"/ small vessels</p> 
<p>8. Severe Tortuosity</p> 	



The remaining nine questions grade the complexity of each significant lesion. This includes information on the length, position and tortuosity of each lesion, and whether the lesion occurs at the junctions of two or three vessel branches (bifurcation and trifurcation, respectively). Factors such as calcification and clotting (thrombus) in the blood vessels and the presence of diffuse disease or small vessels are also considered. The sum of the individual classifications for each lesion and the complexity factor is the patient's general SYNTAX Score.

Higher SYNTAX Scores indicate a more complex disease, a greater therapeutic challenge and potentially worse acute and long-term outcomes.

The SYNTAX Score on the web

Cardiologists and cardiac surgeons can now quickly calculate a patient's SYNTAX Score at www.syntaxscore.com, a new website dedicated to the proper understanding and use of the SYNTAX Score. The website includes a comprehensive tutorial, with definitions of key terms, example cases and a self test. Using the SYNTAX Score Calculator, clinicians can create a description of anatomical complexity of the coronary vasculature that can be a useful tool to aid clinical decision making.

Validating the SYNTAX Score

The SYNTAX trial²

Patients who were screened for inclusion in the SYNTAX trial received a SYNTAX Score assessing their disease complexity. For the 1,800 patients randomised into the study, investigators evaluated the utility of the score for predicting outcomes. In the PCI population, a higher SYNTAX Score was significantly associated with major adverse cardiac or cerebrovascular events. Follow-up in the SYNTAX trial is ongoing and the SYNTAX Score will be evaluated at points throughout.

The ARTS II registry⁴

The SYNTAX Score was retrospectively applied to 1,292 lesions in 306 patients who underwent PCI for three-vessel disease in the Arterial Revascularization Therapies Study Part II (ARTS II). The SYNTAX Score was found to predict the rate of major adverse cardiac and cerebrovascular events, with an almost fourfold adjusted increase in the risk of events in patients with high versus low scores.

References

¹ Ong ATL et al. The SYnergy between percutaneous coronary intervention with TAXus and cardiac surgery (SYNTAX) study: Design, rationale, and run-in phase. *Am Heart J* 2006;151:1194–204

² Serruys PW et al. Percutaneous coronary intervention versus coronary-artery bypass grafting for severe coronary artery disease. *N Engl J Med* 2009;360:961–72

³ Sianos G et al. The SYNTAX Score: an angiographic tool grading the complexity of coronary artery disease. *Eurointervention* 2005;1:219–27

⁴ Valgimigli M et al. Cyphering the complexity of coronary artery disease using the syntax score to predict clinical outcome in patients with three-vessel lumen obstruction undergoing percutaneous coronary intervention. *Am J Cardiol* 2007;99:1072–8