

Risk Scores for Appropriate Left Main Revascularization

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Disclosure Statement of Financial Interest

I, Corrado Tamburino, DO NOT have a financial interest/arrangement or affiliation with one or more organizations that could be perceived as a real or apparent conflict of interest in the context of the subject of this presentation





ACC/AHA/SCAI 2011 PCI Guidelines: Emphasis on Patient-centered Decision-Making

CABG mortality risk

Likelihood of good long-term outcome

Risk of PCI complications



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Levin GN et al. J Am Coll Cardiol 2011;58:44-122



2011 ACC/AHA/SCAI SYNTAX score-based recommendations for LM PCI



- Anatomy at low risk of PCI procedural complications (e.g., a low SYNTAX score of 22, ostial or trunk left main CAD) and increased clinical risk of adverse surgical outcomes (e.g., STS score ≥5)
- Anatomy at low to intermediate risk of PCI procedural complications (e.g., low-intermediate SYNTAX score of <33, bifurcation left main CAD) and increased clinical risk of adverse surgical outcomes (e.g., STS score >2)
- Unfavorable anatomy for PCI in good candidates for CABG





2012 Appropriateness criteria for LM revascularization: what about patients with intermediate SYNTAX score?

ACCF/SCAI/STS/AATS/AHA/ASNC/HFSA/SCCT	PCI	CABG
Isolated left main stenosis	U	Α
Left main stenosis and additional CAD with low CAD burden (i.e., 1- to 2-vessel additional involvement, low SYNTAX score)	U	Α
Left main stenosis and additional CAD with intermediate to high CAD burden (i.e., 3-vessel involvement, presence of CTO, or high SYNTAX score)		Α





Risk Stratification in LM Disease



*not yet presented or validated in LM PCI





Risk Stratification in LM Disease







Fact #1 –The SYNTAX score usefully discriminates MACE and MACCE between patients at low risk and those at high risk undergoing left main PCI







Fact #2 – In observational registries, the intermediate tertile is frequently poorly calibrated with respect to the outcomes of the high and low tertiles







Fact #3 – The SYNTAX score is also a good predictor of hard events but, once again, the intermediate stratum is generally not well calibrated





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Integrating the Synergy between percutaneous coronary intervention with Taxus and Cardiac Surgery (SYNTAX) score into practice: Use, pitfalls, and new directions

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Risk stratification is key in optimizing care of patients undergoing percutaneous coronary intervention (PCI). Score algorithms, in particular, are useful prognostic tools to select the most appropriate strategy of treatment and help patients and their families to get a better understanding of issues relevant to treatment strategies and subsequent risks. Most scores tested in the setting of PCI focus on clinical variables. The SYNTAX score is a semiquantitative angiographic score developed to prospectively characterize the disease complexity of the coronary vasculature. This scoring system has recently been assessed in numerous cohorts of patients undergoing coronary revascularization by PCI or bypass surgery. When using the SYNTAX score, however, physicians are still challenged with a labor-intensive calculation and conflicting results from validation studies. Understanding how the SYNTAX score works, for which patients it works best, and whether it predicts accurately enough for its purpose is of paramount importance to get the maximum benefit from its application. The present article provides an overview of the background and the currently available evidences on the use of the SYNTAX score in patients undergoing coronary revascularizations. (Am Heart J 2011;161:462-70.)



Capodanno et al, *Am Heart J* 2011;161:462-70



The SYNTAX score does not include any subset of lesions





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Is the SYNTAX score time-consuming?





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Solution - You don't have to score each patient!



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Editorial

Does the SYNTAX score get on your nerves? Practical considerations on how and when avoiding it to maximize its usefulnes

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ABSTRACT

The Synergy Between Percutaneous Coronary Intervention With TAXUS and Cardiac Surgery (SYNTAX) score is a useful tool to guide decision-making in patients undergoing three-vessel disease and left main percutaneous coronary intervention. However, someone perceives the SYNTAX score as a labor-intensive surrogate with no added utility over clinical judgment and technical experience. We aimed at reviewing the current limitations of the SYNTAX score and provided practical considerations on how and when this angiographic tool should be used with the goal in mind to maximize its usefulness in the catheterization laboratory. © 2012 Elsevier Ireland Ltd. All rights reserved.



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ospital f Catania Capodanno et al, *Int J Cardiol* 2012 Ahead of print



Only patients with lesions eligible to both procedures should be scored







Vessel distribution in LM disease



A practical implication: You do not need to score patients with isolated LM or LM + 1VD (33% of those with LM disease randomized in the SYNTAX)

Cumulatively, only 51% of patients with complex CAD need to be scored





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The SYNTAX score suffers from moderate interobserver and intraobserver variability

Interobserver reproducibility: k = 0.45
Intraobserver reproducibility: k = 0.59

	Weighted k values		
	2009	2010	
Number of lesions	0.59	0.62	
Bifurcation lesions	0.41	0.36	
Ostial lesions	0.63	0.66	
Total occlusions	0.82	0.91	





Angiography is not enough



Clinical and angiographic scores summarize very different information in patients with unprotected LM

Low Spearman rank correlation coefficient between SYNTAX score and EuroSCORE $(R_s=0.204, p = 0.001)$

The frequency of patients for each cross-tabulation cell is shown within a rectangle that is proportional in size to the frequency



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Capodanno et al, Am Heart J 2010:159:103-9



GRC – Prognostic ability in improving both discrimination and calibration vs SYNTAX score





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Capodanno D et al. Am Heart J 2010;159:103-9



Cardiac death to 2 Years by stratification of GRC and CSS in LM PCI (N = 400)



* log rank test; higher HL (Hosmer-Lemeshow) statistic indicates poorer calibration; higher Δ_{HIGH-LOW} (Index of separation) indicates better discrimination



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Capodanno D et al. JACC Interv 2011;4:287-97



Accuracy is a function of two characteristics







5000

Stand-alone Scores Are Far from Perfection





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Capodanno D et al. JACC Interv 2011;4:287-97



GRC approaches the ideal model for LM PCI





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Capodanno D et al. JACC Interv 2011;4:287-97



Lessons on the GRC from the SYNTAX trial

MACCE



Improved MACCE stratification

Excellent mortality stratification

Death

The GRC may help to identify a population at very low risk of events after LM PCI



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Serruys et al., presented at LM Summit 2011



PCI vs CABG in LM Patients with Low GRC in the SYNTAX Trial at 3 Years





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Serruys et al. J Am Coll Cardiol 2011;58:87 (abstract)



Decision-making based on the Global Risk Classification

		SYNTAX score		
		≤22	22-32	≥32
EuroSCORE	0-2	PCI	PCI	?
	3-5	PCI	PCI	?
	≥6	?	?	CABG

The comparative role of PCI and CABG in LM patients in the intermediate GRC risk group (≈40%) is not well defined





Decision-making based on the Global Risk Classification: cardiac death

		SYNTAX score			
		≤22	22-32	≥32	
EuroSCORE	0-2	PCI	PCI	INT ₂	
	3-5	PCI	PCI	INT ₂	
	≥6	INT ₁	INT ₁	CABG	

PCI



INT₁ = high clinical/acceptable angiographic risk INT₂ = acceptable clinical/high angiographic risk





Decision-making based on the Global Risk Classification

		SYNTAX score			
		≤22	22-32	≥32	
EuroSCORE	0-2	PCI	PCI	CABG	
	3-5	PCI	PCI	CABG	
	≥6	PCI /CABG	PCI /CABG	CABG	

Performing CABG in patients with SYNTAX score ≥32 complies with guidelines

The efficacy and safety of performing PCI in patients with SYNTAX score <33 will be addressed by the EXCEL trial



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Key remarks

- No one should be so self-confident as to favor his own opinion as the only effective prognostic parameter. The SYNTAX score is a nice step forward in the objectificaction of clinical decisions
- However, the SYNTAX score is imperfect as it does not rely on clinical and functional information.
 Therefore, it should not be idealized as a dogma
- Time and variability issues should not contraindicate the use of the SYNTAX score. These problems can be addressed by calculating the score only in doubtful cases, in which an objective measure may really affect clinical decisions



