How to Predict Outcomes of PCI or CABG?

ANGIOPLASTY SUMMIT-TCTAP 2013
April 23 -26, 2013 – Seoul, Korea
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Risk Scores: What’s the point?

Advantages
- Prognostic: predict outcomes
- Assist in providing individualized treatment
- Help physicians and patients choose the most appropriate therapy

Disadvantages
- Time consuming
- Not user-friendly
- Lack predictive power
- Too many models
Ideal Risk Score

Easy to use at the bedside or in the cath-lab

Reproducible

Uses data routinely available before the procedure

Accurate
Which Score?

New York PCI risk score
Residual Syntax score
Duke Jeopardy score
Syntax score
Approach lesion score
New Risk Classification score
EuroScore II
Myocardial jeopardy score
New York CABG risk index
Northern New England score
Logistic EuroScore
Parsonette score
NCDR CathPCI score
ACEF score
STS score
Global risk score
Mayo clinic risk score
Clinical Syntax score
Texas heart institute risk score
Traditional Classification

Clinical

ACEF
Parsonette score
EuroScore
EuroScore 2
STS score

Anatomical

ACC/AHA Classification
Syntax score
Residual Syntax score
Clinical Scores

**EuroScore (additive, logistic, II)**
17 clinical variables
Derived from 20,000 consecutive patients from 128 hospitals in 8 European countries
Independent predictor of MACCE with LMS and MV PCI

**ACEF Score**
3 variables—age, creatinine, ejection fraction
ACEF = [Age/EF (%)] + [1 (if creatinine > 2mg=dL)]
Performance equivalent to EuroScore
Anatomical Scores

ACC/AHA lesion classification system
- 11 angiographic variables
- Lesions classified as: A, B1, B2, C
- Predictive of PCI success
- Prognostic of outcomes pre-DES
- Conflicting data in DES era

Syntax Score
- Anatomical variables: bifurcation, CTO, thrombus, calcium…
- Calculated using dedicated software: weighs lesion & location factors
- PCI: predicts MACE in multivessel & LM
- CABG: no predictive value
Euroscore = 4
SYNTAX Score = 13

SYNTAX Score = 41
Euroscore = 6
Fusion of clinical and anatomical variables

ACEF score (clinical) compared to Syntax score in the LEADERS population

ACEF score superior as a predictor of cardiac death and MI

Syntax score superior as a predictor of MACE and repeat revascularization.

Anatomical and clinical variables are necessary for optimal risk evaluation.
Clinical Anatomical

Combined Risk Scores
Clinical Syntax score
Global Risk score
New Risk Classification score
In LM patients undergoing PCI, combined scores improve the discrimination accuracy of clinical or angiographic stand-alone tools.
Global Risk Score (GRS)

Integrates Syntax + EuroScore (additive)

Conclusion: Incorporation of clinical risk factors and comorbidities into existing estimation systems refines their prognostic ability and guide clinical decisions.

Capodanno D. JACC Cardiol Intv. 2011;4:287–97
Capodanno D. Am Heart J. 2010;159:103–9
Global Risk Score (GRS)

GRC approaches the ideal model for LM PCI
Clinical Syntax Score

Syntax score + modified ACEF score

(modified ACEF score: age/EF+1 point for every 10 ml/min reduction in creatinine clearance <60 ml/min/1.73 m² (max 6 points).

ARTS II: Clinical SYNTAX was superior to Syntax or ACEF scores alone for predicting MACCE in high-risk groups.

Unable to discriminate events in low- and intermediate-risk groups.

Clinical Syntax score uses fewer data to achieve similar discrimination but with poorer calibration than the Global Risk score.
An Emerging Model

The Functional Syntax Score
Functional Syntax Score
Decreases the number of higher-risk patients

Improved discrimination of risk for adverse events
However, NO risk model addresses the single most important factor in determining patient outcome……….
The Most Important Variable
Conclusions

- Detailed anatomical and clinical assessment is required for risk prediction in patients with multivessel disease

- Optimal risk estimation and classification are best achieved by integrating clinical, angiographic and functional data

- User-friendly bedside models not currently available

- Emerging noninvasive functional Syntax score calculation has the potential to improve these processes

- Risk scores help, but cannot replace good clinical judgement and operator skill
I hope that you are less confused

Thanks for your attention