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Citation: Rogers et al.; Sensitivity of the Aortic Dissection Detection Risk Score, a Novel Guideline-Based Tool for Identification of Acute Aortic Dissection at Initial Presentation Results from the International Registry of Acute Aortic Dissection; 2011 May 24;123(20):2213-8

CRITICAL REVIEW FORM FOR A CLINICAL PREDICTION RULE

GUIDE	COMMENTS
I. Is this a newly derived prediction rule? (Level IV)	
1. Was validation restricted to the retrospective use of statistical techniques on the original database? (If so, this is a Level IV rule & is not ready for clinical application).	The ADD score has not been validated in a clinical setting at time of article being published. Purpose of this study is to apply it to a population with known Acute Aortic Dissection and determine its sensitivity in this population.
II. Has the rule been validated? (Level II or III)	
2. Were all-important predictors assessed in the derivation of the prediction guide? Clinical Markers: **Conditions:** (Marfan's, FHx Aortic Dx., known Aortic valve dx., recent aortic manipulation, known TA.) **High Risk Pain Features** (Abrupt in onset, Severe in intensity, Ripping or Tearing) **High Risk Exam Features** Perfusion deficit- CNS, Syst bp or pulse deficit, New AI murmur Hypotension or shock state	The authors modified the "clinical markers" screening criteria found in the 2010 AHA Guidelines that was developed from 290 variables. There were no LR's provided for each of these components and were developed through "expert consensus."
3. Does the rule make clinical sense?	Yes, as the authors point out Aortic Dissection is a somewhat rare entity in presentation overall. This rule aims to help clinicians have a bedside tool (much like Well's/PERC criteria for PE) to possibly identify those at higher risk more quickly and to use more advanced/expensive imaging modalities more judiciously and to a more cost-effective end.

	It also provides a quick and easy tool which can help clinicians to keep the diagnosis of Aortic Dissection in mind.
4. Did validation include prospective studies on several different populations from that used to derive it (II), or was it restricted to only one population (III)?	The decision rule has not undergone external validation in an undifferentiated population It was restricted to the IRAD (International Registry of Acute Aortic Dissection) subset of patients all with known AD. It is a derivation (or modified) tool based upon characteristics of those with AD.
III. How well did the validation study meet the following criteria?	
1. Did the patients represent a wide spectrum of severity of disease?	No. This was not applied to a prospective undifferentiated ED population the patients in the study all had Aortic Dissections.
2. Was there a blinded assessment of the gold standard?	No. This was a derivation and has not been validated.
3. Was there an explicit and accurate interpretation of the predictor variables & the actual rule without knowledge of the outcome?	No as all the patients used had the disease of interest
4. Did the results of the assessment of the variables or of the rule influence the decision to perform the gold standard?	Not applicable.
5. How powerful is the rule (in terms of sensitivity & specificity; likelihood ratios; proportions with alternative outcomes; or relative risks or absolute outcome rates)?	Indeterminate. The decision tool has not been validated and needs further study. The authors report percentages and do not provide likelihood ratios with CI's for components of the tool. Their data suggests that their tool is highly sensitive (true positives) in patients known to have the disease. Specificity is hard to determine in this population since everyone had the disease and 5% of those with Risk score of 0 had AD

III. Has an impact analysis demonstrated change in clinical behavior as a result of using the rule? (Level I)	
1. How well did the study guard against bias in terms of differences at the start (concealed randomization, adjustment in analysis) or as the study proceeded (blinding, co-intervention, loss to follow-up)?	Not applicable
2. What was the impact on clinician behavior and patient-important outcomes?	Not applicable as this was not tested. Thoughts on potential impact in your clinical setting?

<u>Limitations</u>: The study population all had the disease of interest, so is not known how well this applies to the general population. As many may meet one or multiple of the "high risk factors" and warrant further testing.

As pointed out and further explored in the other papers being discussed during this Journal Club you are also left with a smaller subset of the overall population who do not have any of the risk factors and are classified as low risk, but yet still have the disease, so further study is warranted to possibly look for other markers, much like the Well's Criteria and PERC did with d-dimer for low risk patient's and ordering d-dimer's.

No likelihood data provided to help weigh relative importance and predictive value each of the screening components. One would expect that the LR of a pulse deficit or is sig. higher than abruptness of onset of pain.

<u>Clinical Bottom Line</u>: May provide some guidance regarding the pre-test probability determination for undifferentiated chest pain. It also may help remind us to remember to keep Aortic Dissection in minds when screening patients with things like chest/back pain, abdominal pain, or other etiologies to suggest hypoperfusion as noted in the discussions of this paper.

AD remains a zero-risk tolerance for missing these pathologies which occur in 1:10,000 ED visits. A simple externally validated decision tool to guide management could improve diagnostic accuracy and decrease unnecessary testing.