

Block 5 Journal Club Synopsis

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"What is the safety and efficacy of rapid ACS rule-out protocols in the ED?"

The topic of Journal club was emergency department rapid cardiac rule outs for low risk chest pain patients. The intent of the discussion was to look at evidence used for current protocols, prior protocols, as well as likely upcoming protocols. Background reading for the journal club was a hand out from 2012 ACEP lecture titled Chest Pain: Observation and Rapid Rule Outs given by Matthew Strehlow, MD which helped establish what is current standard of care in the emergency department. Our first article looked at the one of the studies used to establish these current protocols.

The first article was from the Journal of American College of Cardiology by Than et al. (2-Hour accelerated diagnostic protocol to assess patients with chest pain symptoms using contemporary troponins as the only biomarker: the ADAPT trial. Than M, Cullen L, Aldous S, Parsonage WA, Reid CM, Greenslade J, Flaws D, Hammett CJ, Beam DM, Ardagh MW, Troughton R, Brown AF, George P, Florkowski CM, Kline JA, Peacock WF, Maisel AS, Lim SH, Lamanna A, Richards AM. *J Am Coll Cardiol.* 2012 Jun 5;59(23):2091-8.). This was an Australian study looking at using troponin only for biomarker testing at presentation and 2 hrs later as the screening for low risk patients presenting for possible ACS. This 2 center study enrolled 1975 patients over a 4 year period. All patients were followed for 30 days and evaluated for adverse events. 392 patients were found to be low risk and biomarker negative using 0 and 2 hr protocol. Of these only one patient was found to have an adverse event at 30 day follow up. This protocol was found to have a sensitivity of 99.7% and a negative predictive value of 99.7%. This is a medium size study with only 2 centers which does not guarantee that these results would be reproducible or applicable to all populations. It does further add to the mounting evidence that these types of protocols are appropriate for low risk patients.

A second article was from *Circulation* in 2001 by McCord et al. (Ninety-minute exclusion of acute myocardial infarction by use of quantitative point-of-care testing of myoglobin and troponin I. McCord J, Nowak RM, McCullough PA, Foreback C, Borzak S, Tokarski G, Tomlanovich MC, Jacobsen G, Weaver WD. *Circulation.* 2001 Sep 25;104(13):1483-8). This article is an older study which was used to develop the 90 min rule out strategy which had been employed at one of our local hospitals until just recently. It was a single center study at Henry Ford Hospital which evaluated 1024 patients from January and May of 1999. Multiple timing strategies were evaluated and the 0 and 90 min mark was found to have a sensitivity of 96.9% and negative predictive value of 99.6%. This study has multiple flaws in it but was used as some of the initial work developing this protocol. It has been cited over 200 times by other studies. This helped illuminate for discussion some of the evidence that lead to current practice in some of our various facilities here in Dayton.

A third article was from the Journal of the American College of Cardiology by Body et al, (Rapid exclusion of acute myocardial infarction in patients with undetectable troponin using a high-sensitivity assay. Body R, Carley S, McDowell G, Jaffe AS, France M, Cruickshank K, Wibberley C, Nuttall M, Mackway-Jones K. *J Am Coll Cardiol.* 2011 Sep 20;58(13):1332-9). This article had a 2 part study; the first being a cohort study of 703 patients looking at preserved blood samples from previously seen patients with concern for ACS. The second part was a clinical study of 915 patients using the same ultra sensitive troponin test. Sensitivity of 99.8% and negative predictive value of 99.4% was found for ACS. This result points to the possibility of using a single test result in the future instead of serial

troponins for ACS in low risk patients – much in the same way as the current d-dimer test for PE.

This journal club was aimed to show evidence-based medicine that is behind what has previously been done, what is current standard of care, and what is likely to come in the relatively near future. Discussion mentioned the flaws of the various studies, but the results from these articles, combined with ACEP background article lead to the consensus that our current goals for practice should be based on current evidence. Current recommendations are for serial troponins at least 2 hrs apart in low risk patients without concerning EKG abnormalities.