

Block 2 Journal Club Summary
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Low Risk Chest Pain: Should they stay or should they go?

I hope that you enjoyed Journal Club at the farm. Overall, the event went well. Thank you to Dr. Pozananski, Dr. Bias, Dr. Kang, Dr. Olson and Dr. Hahn for their contributions. As I reflect on the topic there are a few take-home points that I would like to re-cap.

Scenario/Introduction

You are working a typical day shift and sign up for your first 3 patients who all have a chief complaint of chest pain. You look at all three ECGs and note there are no signs of STEMI and all have normal vital signs initially.

Patient #1 is 45 yo female with a history of smoking, no other significant past medical history. She states that she was eating breakfast this morning about 2 hours prior to arrival and experienced some crushing, substernal pain that was sharp in nature. She stood up from the table, became a little light headed, sat down, and her pain improved after drinking some milk. She now is still feeling generally weak, but has no chest pain. She received ASA from medics. She has normal and stable VS, with an unremarkable physical exam. You closely review her ECG and see some poor t-wave progression, no ischemic changes, with no previous ECGs.

Patient #2 is a 65 yo male with a hx of DM, smoking (although he quit 2 months ago), HTN, and HLP. He was using a push mower this AM about 4 hours prior to arrival when he had some chest discomfort that he thought was indigestion. He stopped to get a drink of water, rested, and his pain resolved. He tried to continue mowing however felt nauseated and weak, and his wife made him come in to be evaluated. He is pain free now, received ASA from medics prior to arrival. His physical exam is unremarkable. No significant changes to his ECG compared to previous.

Patient #3 is an 85 yo male with a known hx of CAD, CABG x3, HTN, HLP, DM, PVD. He had an episode of chest pain last week while watching TV. He felt some chest heaviness and shortness of breath that lasted about 5 mins, and improved after he walked around the house. He lives alone and is widowed, however his daughter lives in the adjoining house and checks on him regularly. He states that he was a fool to mention it to her and she brought him in against his will. He is asking when he can go home. He states he sees his cardiologist regularly and has an appointment later this week. He has some mild hypertension now, otherwise normal VS with an

unremarkable physical exam. He has an old LBBB with no significant changes to his ECG compared to previous.

You have ruled out the other life threatening causes of chest pain based on history and physical exam, and are concerned for cardiac causes of these patients' chest pain. How do you risk stratify and get the most appropriate disposition?

Background Articles

1. Risk for Clinically Relevant Adverse Cardiac Events in Patients with Chest Pain at Hospital Admission. Weinstock MB, Weingart S, Orth F, VanFossen D, Kaide C, Anderson J, Newman DH JAMA Intern Med. 2015 Jul 1;175(7):1207-12.
2. 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.

Current Articles on HEART score / risk stratification:

1. Can the HEART score safely reduce stress testing and cardiac imaging in patients at low risk for major adverse cardiac events? Crit Pathw Cardiol. 2011 Sep;10(3):128-33. Mahler SA, Hiestand BC, Goff DC Jr, Hoekstra JW, Miller CD.
2. A prospective validation of the HEART score for chest pain patients at the emergency department. Backus BE, Six AJ, Kelder JC, Bosschaert MA, Mast EG, Mosterd A, Veldkamp RF, Wardeh AJ, Tio R, Braam R, Monnick SH, van Tooren R, Mast TP, van den Akker F, Cramer MJ, Poldervaart JM, Hoes AW, Doevendans PA. Int J Cardiol. 2013 Oct 3;168(3):2153-8.

1: When you are establishing likelihood of ACS secondary to CAD, please refer back to table 1 in your packet. You may use these criteria in establishing what a good story is for cardiac chest pain vs. atypical/noncardiac chest pain.

2: Normal VS + 2 negative troponins + no ECG changes = EXTREMELY LOW probability of adverse cardiac event. I was indeed surprised at the very large number of patients studied (over 11,000), with over 7,000 meeting inclusion criteria. Of those patients 4 had an adverse cardiac event.

3: The HEART score. A valuable tool for guiding clinical decision making for LOW RISK chest pain. We examined both a retrospective and prospective two large studies, a retrospective and prospective study that illustrate well the utility of using this tool. While accelerated diagnostic protocols (ADPs) are relatively new and continue to evolve, it is valuable to know the foundation studies regarding this concept.

4: Shared Decision Making: as with all clinical decisions, shared decision making with your patient and their family is optimal. Our job is to present the information to the patient. If he/she is at all concerned regarding their symptoms, being conservative and admitting the patient is never a wrong answer. However, if you describe to the patient there is a less than 1.5% chance of having an adverse cardiac event, that may guide a patient's decision making.

5: One of the articles we looked at referred to some things called receiver operating characteristic curves (ROC curves) and the C-statistic. In the discussion of these statistical tools, we looked at an article by Philip Sedgwick in which he explains what these are. He uses a theoretical example of using vital signs as a test for brain lesions. Vital signs are grouped into different strata (i.e. SBP of 120-129 is one stratum). For each stratum for each vital sign, the false positive rate (which is 1-specificity) is plotted on the X-axis versus sensitivity on the Y-axis. For an ideal test, you want it to have a really low false positive rate (be as far left on the X-axis as possible) and a really high sensitivity (as high on the Y-axis as possible), thus having as many of your plotted points as close to the upper-left corner as possible. The c-statistic was referred to in the article is just another name for the area under the curve (AUC). The highest c-statistic value you can have is 1. Thus, a test is a more reliable one the closer its c-statistic value is to 1, meaning its ROC curve comes closer to the upper-left corner of the graph and has a larger area under the curve.

Overall, this was a great discussion on the approach and risk management/decision making to chest pain. At the end of the day, remember we are physicians and your clinical gestalt trumps all data and evidence. If you have a concern for a patient based on their story, risk factors, or any other variable that is difficult to measure or quantify, always fall back on shared decision making with your patient and move forward with a disposition together.