

**Student Name**

**Dr. Ryan**

**NR 567-Advanced Pharmacology for the Adult Gerontology Acute Care Nurse Practitioner**



### **Week 3: Clinical Decision-Making Discussion**

**1.) Explain why an Ace Inhibitor is recommended for a patient who has just experienced an ST-Elevation Myocardial Infarction (STEMI).**

According to Lee et al (2023), in comparison to other classes of anti-hypertensive medications, especially angiotensin receptor blockers (ARBs), angiotensin-converting enzyme inhibitors (ACEIs) are recommended as first line therapy in patients with acute myocardial infarction (MI) as there is concern of ARBs increasing MI in hypertensive patients. ACEI is also recommended in patients with multiple conditions, such as ST- Elevation MI (STEMI), non-STEMI (NSTEMI), anterior infarction, heart failure (HF), left ventricular (LV) systolic dysfunction, and diabetes mellitus (DM) (unless contraindicated) (Lee et al, 2023). According to Goyal et al (2022), the use of ACEIs are recommended by HF guidelines for the prevention of HF in patients with a reduced ejection fraction (EF), those who have a history of MI, as well as to treat patients with both HF and a reduced EF. According to Goyal et al (2022), the American College of Cardiology recommends the initiation of ACEIs within 24 hours of all STEMI, which is specifically in patients with anterior MI, HF, or LV EF of 40% or less. This recommendation is derived from evidence proving the effectiveness ACEIs have on the overall reduction of mortality in multiple conditions, such as hypertension, HF, acute MI, and DM (Goyal et al, 2022). According to Rincon-Choles (2019), one other explanation for why ACEIs have been recommended as first-line therapy for STEMI and other conditions compared to ARBs by most guidelines “was thought to be a result of a greater vasodilatory effect caused by inhibiting the degradation of bradykinin and leading to increased levels of nitric oxide and vasoactive prostaglandins” (p. 608). According to Kim et al (2019), some other benefits of ACEIs are for its role in lowering blood pressure, reducing the progression of atherosclerosis, enhancing endothelial function, and cardiovascular remodeling, all of which leads to improvement on cardiovascular outcomes such as MI or HF.

**2.) Which pharmaceutical agent (include dose, route, frequency) would you prescribe for this patient? Explain your rationale.**

According to Kim et al (2019) and Heidenreich et al (2022), both the American College of Cardiology Foundation (ACCF) as well as the American Heart Association (AHA), recommend the initiation of oral beta-blockers (BB) within the first 24 hours and continued during and after hospitalization in patients with STEMI and who do not have a contraindication to ACEIs. If the patient has a contraindication to BBs, ACEIs should be initiated, and if the patient has an intolerance to this medication class, ARBs should be initiated (Kim et al, 2019; Heidenreich et al, 2022). Based on this information, one of the recommended beta blockers I would prescribe to this patient is bisoprolol 5 mg by mouth once daily with the target dose being 10 mg once daily (Heidenreich et al, 2022; Frederix & McIntosh, 2017). According to Bazroon & Alrashidi (2022), bisoprolol is only administered orally with the dose being titrated based on individualized needs. According to Bazroon & Alrashidi (2022), the usual dose for this medication is 5 mg once daily, however, if it does not produce a desired antihypertensive effect, the dose can gradually be increased to 10 mg, and if there is still no desired effect after this it can be increased to 20 mg. If initiating a BB for my patient is contraindicated, I will proceed to the following recommendation of initiating an ACEI, which in this case would be lisinopril 2.5-5mg by mouth once daily with the target dose being 20-40 mg once daily (Heidenreich et al, 2022). According to Olvera Lopez et al (2023), the 2013 ACCF/AHA Guideline (Level of Evidence, A) strongly recommends lisinopril to be initiated for all STEMI patients within the first 24 hours unless contraindicated. According to Olvera Lopez et al (2023), the recommended starting dose for lisinopril is 2.5 to 5 mg per day with a 10 mg daily titration up to the maximal dose tolerable in hemodynamically stable patients. Therefore, with each medication the dose will need to be titrated based on an individualized response. It will be best to start with the lower dose to better determine its effectiveness and determine the necessity for a higher dose.

**3.) Determine whether the Ace Inhibitor will protect the patient from having a cardiac arrhythmia post STEMI? Explain your rationale.**

According to the National Heart, Lung, and Blood Institute (NIH, 2022), a cardiac arrhythmia is an irregular rhythm of the heart that occurs when the heart beats either too quickly, too slowly or in irregularity. The NIH (2022) mentions some causes of cardiac arrhythmias, which include cardiac and blood vessel conditions such as cardiomyopathy, congenital heart defects, MI, and