1. **Explain the rationale for the ECG request.**

Betsy had formerly been diagnosed with pulmonary heart disease and hypertension. In this case, the ECG would be based on respective protocol in terms of her medical history. The test is supposed to measure all the electrical activity in her heart to ensure that the past medical history does not repeat itself. Having Betsy’s heart work normally means that there is a possibility the rest of the symptoms would not be a cause for much concern. This is mainly since there would be certainty concerning the woman’s health in terms of her heart and her blood pressure (Schroeder *et al.,* 2016). According to her heart’s rhythm and activity, it is easy to see what was required in terms of her health and also how it would be done to ensure that there are no rising complications. There was a need to know her level of cholesterol around her blood supply as well as the possibility of a heart attack and any heart rhythms that were abnormal.

**2a. Describe the pathophysiology of angina, with reference to causes, progression and outcomes.**

Stable angina also known as Stemi angina pectoris has several symptoms attached to it. Starting from the pains in the chest and also a kind of pressure that is adjoined to the pain. The pain may also radiate to other parts such as the jaw area or the shoulder. These symptoms are more exaggerated in cases where emotional stress is exerted in one way or another. In this case, oxygen moves to the heart through the vessels with a larger surface and enters the intramyocardial arteries as well as the arterioles. An unhealthy heart does not resist blood flow to the epicardia vessels but rather encourages the same. The heart blood flow rapidly changes through a process called autoregulation and can be either fixed or dynamic.

Some of the main characteristics that affect the prognosis are the number of vessels that are obstructed. This rapidly reduces the rate of survival. Based on the vessel disease that each of the patients has (Puelacher *et al.,* 2018). The survival rate is also determined by other factors that are relative to a person’s medical history as well. Unstable Angina or non-stemi angina on the other hand is part of a spectrum that is collectively known as the acute coronary syndromes. There are mechanisms that are relative to the symptoms displayed for unstable angina. The mechanisms could play a huge role in plaque rupture and inflammation as well. There are also mechanisms that do not involve any thrombosis. These are such as the proliferation of the smooth muscles. The medial processes all range from antithrombotic drug therapy to antianginal therapy, depending on the type of assistance that is required.

**2b.** **List two risk factors specific to Betsy (not including age or gender) that increase her risk of Acute Coronary Syndrome**

There are two main risk factors in line with Betsy’s condition and the risk of her being exposed to acute coronary syndrome (Mokhtari *et al.,* 2015). The first risk is that she has stable angina which also means that she has discomfort and this can also be described as an aching or a pressure or tightness merged with a burning sensation. The second risk is that she also experiences shortness of breath and is at 72 years of age.

**Appendix 1 is an ECG that was taken while Betsy was experiencing nausea and shortness of breath. Systematically analyse the ECG, commenting on the: Rhythm, Rate, Presence and regularity of p waves and ST segment**

**What is your interpretation of this ECG?**

The ECG shows the probability of acute coronary syndrome. It also shows a sinus rhythm of 72 beats per minute. This was matched with a negative T wave and fast heart rate.

**Discuss three of the central findings that potentially lead to a diagnosis of Acute Coronary Syndrome.**

There are certain major factors that lead to the diagnosis of Acute Coronary Syndrome. The symptoms are often very specific and particular to the patient. However, there are some very common risk factors that vary depending on the person’s health. These factors are such as high blood pressure, being overweight and a case of acute coronary syndrome as part of the family history. In this case therefore, diagnosis shows that the cardiac muscle is damaged as a result of myocardial infarction. The clinical assessments have to show the evidence of increased cardiac troponin levels as a source of acute ischemia. This is then matched with chest pain which affects a smaller percentage of the patients with a minimum of 1.5% of the patients going for consultation in the fear of stirring up a much larger problem (Katus *et al.,* 2017). There are criteria specified to these findings. These are such as using history as well as a physical exam for the patients. The other factor is to use the risk scores that are provided in order to rightfully evaluate the level at which the issue can be assessed. The normal serial electrocardiography results should be assessed as the patient is still within the hospital before getting discharged. The use of coronary computed tomography angiography is not recommended in clinical aspects; this may be damaging for patients with acute chest pains.

**Discuss the following drugs: GTN, diltiazem and pravastatin.**

*GTN*

GTN is referred to as a vasodilation agent and causes the vascular smooth muscles to relax. It is used to produce an effect meant to reduce all types of pressure within the muscles. The venous return to the heart may be reduced through pooling and the reduction of systemic vascular resistance. The heart rate may be increased very slightly and a half-life estimate made in response to the same. The relaxation of the arterial system is what reduces the afterload. The side effects include factors such as headache, vomiting, restlessness and twitching of the muscles.

*Diltiazem*

Diltiazem is a preventive drug that is used specifically in the prevention of angina. The medicine is used to block calcium channels and relax blood vessels as well by the lowering the heart rate (Jane, 2016). The blood will then flow more easily within the body and therefore works less hard in pumping the blood.  The medication is taken by mouth before meals and also at bedtime as directed by a doctor. The side effects may be such as upper stomach pain as well as itching and nausea,

*Pravastatin*

Pravastatin can be grouped under statin drugs. These drug lowers bad cholesterol and raises the good cholesterol in the blood. The cholesterol made by the liver is reduced and the risks of heart disease and strokes are also reduced altogether (Handler, Coghlan & Brown, 2018). There are lifestyle changes that work well with the use of this drug. These changes are also matched with good and healthy diets. The medication depends on a doctor’s directives and may also in some cases react with other medications causing complications, the side effects of this drug are such as muscle weakness and tenderness as well as a fever and the yellowing of the skin or eyes.

. **Discuss the mechanism of action and use of aspirin and ticagrelor in cardiac patients.**

Using both Ticagrelor and aspirin is known as antiplatelet therapy and the same is done to cure or control acute coronary syndromes.  Ticagrelor is a drug that is taken orally and directly to reduce any thrombotic effects altogether. In the trial for platelet inhibition and patient outcomes, ticagrelor was significant in the reduction of cardiovascular events, cardiovascular mortality and all other factors that are relative to health and mortality. Doses of aspirin combined with this reflect very good clinical practice (Valgimigli *et al.,* 2017). The two combined at solid state have a simple eutectic transition at 98 degrees centigrade with a mole fraction that adds up to approximately 0.5 eutectic liquid. The mechanism involves a decomposition process that works throughout a span of over 12 months. Ticagrelor is commercially available as one of the best antiplatelet adenosine diphosphate. The combination of the ADP with ASA is meant to be managed and precaution taken against any form of bleeding that takes place in patients who suffer certain coronary complications.

**Discuss how morphine is used in ACS, including the benefits and controversies.**

Morphine has an analgesic effect and is often recommended as a reliable drug in healthcare within Europe and also in the USA. There are some potential safety concerns that make it controversial in its use. Morphine has undergone an eligibility criterion that is meant to assess how reliable it is for Acute coronary syndrome. There are findings from observational studies and these evaluate the impact of morphine to cardiovascular outcomes or the reaction of platelets to the same (McCarthy *et al.,* 2016). The many outcomes that were brought forth involve issues and factors such as hospital mortality and other cardiovascular events that are major and adverse. The first issue is relative to the risk of bias whereby observational studies assess the aspect of instinct and the wrong judgement leading to risky and unclear domains in the way that morphine is presented.

Being an analgesic, morphine produces more results than any other drug that is present in terms of both positive and negative perspectives. The rate of mortality within hospitals is based on the outcomes relative to the use of morphine. It covers an observational aspect that exceeds the total number of expected pooled results from the whole process. It is often the exclusions of facts that delay the processes and often offer the wrong information on the basis of what is required as being part of an observational finding. In spite of having such a high reliance on morphine for ACS, there had been conflicting data that was brought to light. The increase in mortalities as well as Major and adverse cardiovascular events were just findings that would lead to a systematic review on the facts that follow the effects of morphine. The decrease in antiplatelet effect of P2Y12 follows the first hours of treatment in ACS (Bonin *et al.,* 2018). it’s safe to say that the misuse and misconception of the drug’s effects could be detrimental in the long run.

**Use current research to link the increased risk of depression with chronic illness.**

Depression comes with several causal aspects. In a case like this, Betsy experiences a series of symptoms which distract the normal workings of the body and stress the physiological as well as the mental. This may be as a self-reported distress symptom in that it does not fully qualify as a psychiatric disorder. There are self-report measures that can be used to assess the state at which Betsy shows a risk of depression. It is based on very specific merits that can only be equivalent to her lifestyle and her mental state in line with the coronary heart disease (Kim *et al.,* 2017). The discrepancies that come between what is said during investigations and the meaning of the term depression may determine if she is at risk or not. The determinants do not often fall obvious in line with the patient’s behaviour but create a seclusion on the expected outcomes as well as the issues that are seen and experienced by those affected, including of the doctors and healthcare assistants. The probability of ACS patients to suffer depression is an 80% high and makes it more likely for Betsy in her condition to go through depression. The relevant criteria for use is DSM and it establishes a clear and reliable diagnosis concerning the same.

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