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1. Prior to administering GTN to Leonard, what are the relevant considerations regarding the following;

- The dose and frequency of administration you would use?

The normal dose for GTN is 300-600 micrograms; I would use about 500 micrograms of GTN on Leonard, as he describes his pain as severe and his history may indicate he has built up a tolerance, requiring a slightly stronger dose. A normal dose for Leonard would be 1 or 2 sprays, with regular sprays at intervals to ensure that his condition remains stable (Hughes and van Tienen, 2010).

- The patient's vital signs and history you consider important?

The patient has a history of heart disease and cerebrovascular accidents, meaning that it is possible that he has had GTN administered before. His blood pressure suggests mild hypertension, but his respiration and circulation are normal.

2. Explain in point form:

- The pharmacodynamics rationale for administering this drug (i. e. what physiological effects would you expect GTN to have?).

Leonard's condition is consistent with angina - chest pains and a lack of oxygen in the heart. The administration of GTN will lower his systolic blood pressure and reduce the demand of oxygen on the heart. GTN would act as a vasodilator, lowering myocardial ischaemia and relieving the associated pain (Hughes and van Tienen, 2010).

- The mechanism of action of GTN.

GTN contains nitrates which, when inserted into the system, interact with a number of mechanisms to create NO in the body. The GTN then denitrates with mitochondrial aldehyde dehydrogenase to form 1, 2-glycerol dinitrate and NO - (mtALDH) (Hughes and van Tienen, 2010).

- The pharmacokinetic rationale for the sublingual route of administration of GTN (i. e. the implications of this route of administration).

The sublingual route of administration makes sense for Leonard, as he needs immediate relief, and the sublingual spray provides the fastest route of administration of a higher concentration of GTN to the body. Given his description of the pain as 8 out of 10, it is fairly severe and must be treated immediately (Hughes and van Tienen, 2010).

- Any specific instructions or advice you would give to Leonard regarding the use of this medication. (Include the sources of your drug information)

I would tell Leonard to not use it when he does not have to, and only for emergencies; a further tolerance can build up, making it lose its effectiveness. If he is taking an erectile dysfunction pill like Viagra or Cialis, I would recommend he not use them in conjunction, as it can prove fatal (Wei et al., 2010).

The anterior wall of the heart seems to be depolarized, there are negative deflections in the third quarter of the reading. My immediate transport considerations for Leonard would be to keep him still and not allow him to

move for a time; there is no need to immediately move him from his home, so treatment at his residence may be possible.

4 - What is your clinical reasoning for giving Leonard aspirin at this stage? In your answer, consider the following:

The pharmacodynamics rationale for administering aspirin in this setting (i. e. what physiological effect(s) would you expect aspirin to have?).

In this case, aspirin would act to stop blood clots from forming, lessening the chances for a stroke or heart attack (Razzouk et al., 2010). Leonard requires added protection from these conditions due to his angina, and would benefit from such a regimen.

- The mechanism of action of aspirin relevant to this setting.

In this instance, aspirin is relevant due to its ability to inhibit cyclooxygenase (COX) isozymes; thromboxanes can bring about clotting, which leads to heart attacks. Lipoxins are formed when aspirin modifies COX-2, acting as an anti-inflammatory (Razzouk et al., 2010).

- Anything you would consider before giving Leonard this drug and the reason(s) for these considerations.

I would consider Leonard's potential allergies, and the other medications he was taking - adverse side effects of aspirin with drugs like ibuprofen and penicillin can be hazardous (Razzouk et al., 2010). However, as he is allergic to penicillin, that particular danger is negligible.

- The advice you would give Leonard about the drug and the way in which it is administered.

(Include the sources of your drug information)

I would advise Leonard to take one aspirin a day and no more, in order to prevent the onset of a heart attack and persistently lessen risk of clotting. It is taken orally, and I would advise him not to mix it with alcohol, as that can increase the risk of stomach bleeding (Rxlist, 2011).

5- What is the rationale for administering clopidogrel to Leonard? In your response consider:

The pharmacodynamics rationale for administering clopidogrel (i. e. what physiological effect(s) would you expect clopidogrel to have?).

Clopidogrel is to be administered to Leonard due to his need to prevent further ischemic events, as well as address his potential atherosclerosis. It will also interact with the aspirin to inhibit platelet aggregation (Berger and Steinhubl, 2002).

- The mechanism of action of clopidogrel.

Clopidogrel works by activating itself to an active metabolite through the cytochrome P450 system (CYP). It inhibits the ADP receptor in order to stop platelets from aggregating through blockage of glycoprotein IIb/IIIa pathway activation (Berger and Steinhubl, 2002).

- What are the implications of administering clopidogrel prior to coronary angiography?

Clopidogrel and other thienopyridines administered prior to coronary angiography have the effect of decreasing the relative risk of incurring further recurrent events in a patient, in a similar fashion to aspirin.

Pretreatment with clopidogrel provides added antiplatelet support to patients undergoing coronary angiography (Widimsky et al., 2008).

- In what clinical situation would it be inappropriate to administer clopidogrel to Leonard?

(Include the sources of your drug information)

Clopidogrel should not be administered along with aspirin or other non-steroidal anti-inflammatory drugs, due to the risk of hemorrhaging and intestinal bleeding (Laroche et al., 2007). If Leonard has a history or higher likelihood of stomach or intestinal bleeding, he should not take clopidogrel (RxList, 2011).

## **Works Cited**

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