CPD January 2023: Celecoxib

Day 1. Discovery of the COX-2 channel in the early 1990s led to 2 new NSAIDs designed & licensed with COX-2 selective action. The new drug target implied therapeutic and adverse drug effect (ADE) superiority, but only [#celecoxib](https://twitter.com/search?q=%23celecoxib) endured, as rofecoxib (Vioxx) was found to have the highest cardiovascular risks.

Day 2: [#celecoxib](https://twitter.com/search?q=%23celecoxib) is licensed in adults for pain & inflammation in OA & RA & ankylosing spondylitis. Oral (capsule) use only; adult dose range is 200-400 mg in daily divided doses for the shortest duration possible. Not indicated for use in children & contra-indicated in pregnancy

Day 3: [#celecoxib](https://twitter.com/search?q=%23celecoxib) has good oral absorption taken with/without food (no advisory label). Major hepatic metabolism by CYP2C9 leads to inactive metabolites & elimination. Hepatic impairment, elderly & poor metabolisers incur increased drug levels, therefore use with caution. Contra-indicated in severe hepatic or renal impairment

Day 4: [#celecoxib](https://twitter.com/search?q=%23celecoxib) mechanism of action:NSAIDs all bind to membrane bound cyclooxygenase (COX) in the cells' endoplasmic reticulum. [#celecoxib](https://twitter.com/search?q=%23celecoxib) blocks the active site of inducible COX-2 enzymes, which lowers prostaglandin production. This reduces pain & inflammation. COX-1 activity relatively unaffected, so superior gut protection

Day 5: Common ADEs for [#celecoxib](https://twitter.com/search?q=%23celecoxib) include cough, hypersensitivity, rash, insomnia, arthralgia, myocardial infarction. Uncommon include heart failure, depression, tinnitus, visual disorders, (NOT exhaustive). Overall, there is a lower risk of GI adverse effects, especially in high-risk groups, e.g history peptic ulcer or GI vulnerability e.g ulcerative colitis. However, caution is still required & [#celecoxib](https://twitter.com/search?q=%23celecoxib) contraindicated if active gastro-intestinal bleeding or ulceration

Day 6: DDIs. CYP2D6 inhibition by [#celecoxib](https://twitter.com/search?q=%23celecoxib) can cause increased levels of anti-depressants & more ADEs. Risk of bleeding with all anti-platelets/coagulants & SSRIs. Diuretics can cause acute renal failure & corticosteroids can increase the risk of GI bleeds. Combination with lithium or methotrexate can lead to toxicity (NOT exhaustive)

Day 7 Selective COX-2 inhibition by [#celecoxib](https://twitter.com/search?q=%23celecoxib) uncouples vascular cyclooxygenase function. This can lead to loss of anti-thrombotic protection & more cardiovascular events. Use is contra-indicated in cerebrovascular disease, ischaemic heart disease & peripheral arterial disease

CPD: in addition to the tweets, read the BNF treatment summary on ‘Non-steroidal anti-inflammatory drugs and the monograph for Celecoxib, as well as the Celecoxib Summary of Product Characteristics

<https://bnf.nice.org.uk/treatment-summaries/non-steroidal-anti-inflammatory-drugs/>

<https://bnf.nice.org.uk/drugs/celecoxib/>

<https://www.medicines.org.uk/emc/product/3445/smpc#PRODUCTINFO>

1. The discovery of the enzyme cyclooxygenase 1 (COX-1) and its functions happened before the discovery of COX-2?

TRUE or FALSE?

1. Which of the following is TRUE?
2. Arachidonic acid is the main substrate for all forms of cyclooxygenase (COX) enzymes
3. Prostaglandins are the only product of COX enzymatic activity
4. COX-2 is only found in white blood cells
5. Celecoxib is the only COX-2 inhibitor on the UK formulary
6. Rofecoxib (Vioxx) was removed from the market because of associated increased risk of cardiovascular events

TRUE or FALSE?

1. Celecoxib is licensed for use in all age groups

TRUE or FALSE?

1. Celecoxib is associated with significant genetic variations because of its active metabolites

TRUE or FALSE?

1. Which of the following is FALSE?
2. Celecoxib is selective for blocking the COX-2 enzyme
3. Celecoxib lowers prostaglandin levels and therefore inflammation
4. Celecoxib should be taken with food
5. COX-2 selective NSAIDs are associated with increased risk of cardiovascular events
6. Because of its selective effects, celecoxib cannot harm the gastro-intestinal tract

TRUE or FALSE?

1. Cardiovascular events such as angina and myocardial infarction are ‘common’ adverse drug events for celecoxib

TRUE or FALSE?

1. Which of the following is TRUE?
2. Celecoxib and non-selective NSAIDs have the same gastro-intestinal risk
3. All diuretics have a ‘severe’ drug-drug interaction with celecoxib
4. Visual disorders are common adverse drug events for celecoxib
5. Celecoxib is safe to take in pregnancy
6. It is a contra-indication to take celecoxib if there is ischaemic heart disease

TRUE or FALSE?