### TABLE 1
**Overview of opioids and their use in palliative care**

<table>
<thead>
<tr>
<th>Opioid</th>
<th>Commonly-used formulations</th>
<th>Hepatic Metabolism</th>
<th>Half-life (T1/2)</th>
<th>Approximate dose equivalence</th>
</tr>
</thead>
</table>
| **Morphine** | I/R tablets, I/R oral solution, M/R 12 hourly preparations, Solution for injection | Morphine is conjugated with glucuronic acid to produce morphine-3-glucuronide and morphine-6-glucuronide (phase 2 reaction) | 1.5-4.5 hours | AVOID  
  - Morphine-6-glucuronide (active metabolite) can accumulate with its T1/2 increasing to upwards of 50 hours  
  - Avoid, but if no alternatives, seek specialist advice |
|             |                            | Morphine-6-glucuronide |                | USE CAUTIOUSLY  
  - T1/2 increased by up to 100%  
  - Note that reduced first-pass metabolism leads to a higher oral bioavailability.  
  - Use cautiously, titrate slowly, I/R products can be given regularly e.g. every 6-8 hours. |
|             |                            | NO other formulations available |                | Oral morphine to subcutaneous morphine:  
  - Divide dose by 2 (e.g. 10mg of oral morphine equals 5mg of subcutaneous morphine) |
| **Oxycodone** | I/R capsules, I/R oral solution, M/R 12 hourly preparations, Solution for injection | Oxycodone undergoes N-dealkylation via CYP2A4 to produce noroxycodone and O-demethylation via CYP2D6 to oxymorphone (phase 1 reaction) | 2-4 hours | USE CAUTIOUSLY  
  - Oxycodone and its metabolites can accumulate in renal impairment.  
  - T1/2 extends to 3-5 hours.  
  - Avoid, but if no alternatives, seek specialist advice |
|             |                            | Noroxycodone is weakly active and oxymorphone is active, but is produced in minor quantities. |                | Oral morphine to oral oxycodone:  
  - Oxycodone regarded as being 1.5 - 2 x more potent than morphine (local practice may vary, so check local guidelines, as they may recommend a 2:1 rather than a 1.5:1 morphine:oxycodone conversion ratio)  
  - Divide dose by 1.5 (e.g. 15mg of oral morphine equals 10mg of oral oxycodone)  
  - Oral oxycodone to subcutaneous oxycodone:  
    - Divide dose by 2 (e.g. 10mg of oral oxycodone equals 5mg of subcutaneous oxycodone) |
| **Alfentanil** | Solution for injection, No other formulations available | Alfentanil undergoes oxidative N- and O-dealkylation via CYP3A4 (phase 1 reaction) | 1.5 hours | SAFE TO USE  
  - T1/2 unchanged in severe renal impairment  
  - Generally regarded as safe to use. Usual starting dose is 0.5-1mg over 24 hours via syringe pump with 100 micrograms when required |
|             |                            | No |                | USE CAUTIOUSLY  
  - T1/2 increased, repeat administration may lead to unwanted accumulation  
  - Low doses may be sufficient |
|             |                            | SAFETY TO USE |                | Oral morphine to subcutaneous alfentanil:  
  - Divide dose by 30 (e.g. 30mg of oral morphine equals 1mg of subcutaneous alfentanil) |
| **Fentanyl** | T/D patches | Fentanyl undergoes N-dealkylation and hydroxylation via CYP3A4 (phase 1 reaction) | 13-22 hours when used transdermally | SAFE TO USE  
  - T1/2 increased possible  
  - Generally regarded as safe to use, but lower doses may be sufficient |
|             |                            | No |                | SAFE TO USE  
  - T1/2 unchanged  
  - Generally regarded as safe to use |
|             |                            | SAFETY TO USE |                | Oral morphine to transdermal fentanyl:  
  - Fentanyl is 100 times more potent (e.g. 60mg of daily oral morphine divided by 100 equals 0.6mg of fentanyl daily)  
  - Convert this to micrograms (e.g. 0.6mg x 1000 = 600 micrograms of fentanyl/24h)  
  - Finally, convert this to an hourly rate, (e.g. 600 micrograms / 24 hours = 25 micrograms per hour of transdermal fentanyl) |
| **Buprenorphine** | T/D patches | Buprenorphine is pharmacologically active at opioid receptors, but has limited penetration across the blood brain barrier, hence central action is limited | 13-36 hours when used transdermally | SAFE TO USE  
  - T1/2 increased possible  
  - Generally regarded as safe to use, but lower doses may be sufficient |
|             |                            | Norbuprenorphine is pharmacologically active at opioid receptors, but has limited penetration across the blood brain barrier, hence central action is limited |                | USE CAUTIOUSLY  
  - Possible increase in T1/2  
  - 66% of drug excreted unchanged in faeces via biliary tract (accumulation may occur in cholestatic disease)  
  - Due to limited experience consider alternative opioid first. If no alternatives seek specialist advice |
|             |                            | USE CAUTIOUSLY |                | Oral morphine to transdermal buprenorphine:  
  - Buprenorphine is 100 times more potent (e.g. 50mg of oral morphine divided by 100 is equivalent to 0.5mg of buprenorphine daily)  
  - Convert to micrograms (e.g. 0.5mg x 1000 = 500 micrograms of buprenorphine /24h)  
  - Finally, convert this to an hourly rate (e.g. 500 micrograms / 24 hours = approx. 20 micrograms per hour of transdermal buprenorphine) |