The absorption, distribution, and metabolism of cannabis dictates the onset and duration time. Therefore, the differences in administration routes must be understood to better prescribe or recommend cannabis products.

### Cannabis: Routes of Administration

**MacCallum CA, Russo E. Practical considerations in medical cannabis administration and dosing. 2018**

**Smoking**
- The most common administration route of cannabis recreationally
- Combusts at ~600-900 degrees Celsius
- Combustion produces toxic by-products such as tar, PAH, Carbon Monoxide, ammonia
- Chronic cannabis smoking has been associated with respiratory symptoms - bronchitis, cough, phlem - but not cancer or COPD
- Mixing Cannabis with Tobacco increases a patient’s cancer and respiratory risk
- 30-50% of cannabis is lost as "sidestream" smoke

**Vaporization**
- Produces significantly less harmful byproducts than smoking
- Heats cannabis to 160-230 degrees Celsius reduced CO, but not full elimination of PAH
- Decreased pulmonary symptoms have been reported than seen in smoking
- Allows for quick onset (5-10 min)

**Oral**
- Orals, Capsules, Edibles, etc
- Edibles are more difficult to dose
- Juicing and Cannabis Teas do not allow for enough decarboxylation of the raw plant
- Tinctures and Lozenges: immediate onset, but currently limited in research

**Other routes**
- Topicals are ideal for localized symptoms (dermatological conditions, arthritis)
- Suppositories: Variable absorption seen for specific populations (cancer, GI symptoms, young/elderly). THC-hemi succinate has shown the best absorption, but there is limited research

### Table: Onset, Duration, Pros, Cons

<table>
<thead>
<tr>
<th>Route</th>
<th>Onset (min)</th>
<th>Duration (hrs)</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>5 - 10 min</td>
<td>2 - 4 hours</td>
<td>Rapid onset, which is good for acute or episodic symptoms</td>
<td>Dexterity is required, vaporizers can be expensive, may not be portable</td>
</tr>
<tr>
<td>Vaporization</td>
<td>15 - 45 min</td>
<td>6 - 8 hours</td>
<td>Less odour, convenient, discrete advantage for chronic symptoms</td>
<td>Titration challenges as a result of delayed onset</td>
</tr>
<tr>
<td>Oral</td>
<td>60 - 180 min</td>
<td>6 - 8 hours</td>
<td>Less odour, convenient, discrete advantage for chronic symptoms</td>
<td>Titration challenges as a result of delayed onset</td>
</tr>
<tr>
<td>Oral Oromucosal</td>
<td>15 - 45 min</td>
<td>6 - 8 hours</td>
<td>Pharmaceutical form available (nabiximols) documented efficacy &amp; safety</td>
<td>Expensive, spotty availability</td>
</tr>
<tr>
<td>Oral Topical</td>
<td>Variable</td>
<td>Variable</td>
<td>Less systemic effect, Good for localized symptoms</td>
<td>Only localized effects</td>
</tr>
<tr>
<td>Oral Edible</td>
<td>Variable</td>
<td>Variable</td>
<td>Less systemic effect, Good for localized symptoms</td>
<td>Only localized effects</td>
</tr>
</tbody>
</table>

**Recreational routes**
- Inappropriate for medical use includes shatter, dabs, concentrates
- Recreation routes: deliver high doses of THC, have high risk of euphoria, impairment, high risk of reinforcement, toxic psychosis, orthostatic hypotension, etc.