Medical Cannabis use in the Older Patient

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Audience Poll

What is the fastest-growing demographic of cannabis users?

a) Ages 14-23
b) Ages 25-35
c) Ages 35-45
d) Ages 40-55
e) Ages 55 and older
Objectives

1. Describe the pathophysiology of how cannabis works, the types and strains
2. Discuss the indications for use and identify eligible patients
3. Review the formulations that are senior friendly and how to prescribe and monitor patients that are on cannabis therapy
4. Describe barriers to its use
Clinical Case – Mr. Payne

- 82 years old, with history of chronic low back pain and OA
- Underwent laminectomy August 2016

- On multiple pain medications including:
  - Hydromorphone Contin 24 mg po BID
  - Hydromorphone 2 mg po QID
  - Hydromorphone 1 mg po q6h PRN
  - Duloxetine 90 mg po daily
  - Gabapentin 300 mg po QID
  - Nortriptyline 10 mg po QHS
Clinical Case

• Despite this regimen, pain is not controlled and has been to ER three times since back surgery for falls and/or for early medication refills
• He has heard that medical marijuana can help his pain and even help him get off his other pain medications
Cannabis plant

- Dried female flowers ("buds") are used as male species of the plant contain pollen
Cannabis subspecies

- **Indica**
  - Short plant
  - Broad leaves
  - *Sedating*

- **Sativa**
  - Tall plant
  - Narrow leaves
  - *Stimulating*
Pathophysiology of Cannabis

• Cannabis plant contains over 500 compounds of which 85 of those compounds act on cannabinoid receptors

• 2 notable cannabinoids in cannabis:
  • Tetrahydrocannabinol (THC) – psychoactive
  • Cannabidiol (CBD) – non-psychoactive
Cannabinoid Receptor Sites

CB2 receptors
mainly situated in the periphery
(spleen, tonsillar and immune cells)

Basal Ganglia
Hippocampus
Cerebellum

CB 2 receptors
Immune cells
THC

• Potential therapeutic use as an: The 4 A’s
  - Antiemetic
  - Antispasmodic
  - Analgesic
  - Appetite stimulant

DON’T FORGET....

• PSYCHOACTIVE!
Cannabinoids - CBD

- CBD mechanism unclear, and has little binding affinity to receptors
- CBD can act as:
  - Anti-inflammatory
  - Anti-epileptic
  - Anxiolytic
  - Anti-psychotic
CBD

Advantages

• Lack of psychoactivity
• Can be administered in higher doses
• Not toxic even when administered chronically

Disadvantages

• Low bioavailability
• Low solubility leading to incomplete absorption
## THC vs. CBD

<table>
<thead>
<tr>
<th></th>
<th>THC</th>
<th>CBD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anti-emetic</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Analgesic</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Anxiolytic</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Antispasmodic</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Anti-inflammatory</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Antipsychotic</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Appetite</td>
<td>✔</td>
<td></td>
</tr>
</tbody>
</table>
Strain differentiation

• Cannabis plant contains terpenes which are responsible for the plant’s distinct odor and flavor

• The mixture of terpenes and cannabinoids may result in variable effects that are felt with certain strains
## Bioactive terpenoids in cannabis

<table>
<thead>
<tr>
<th>Compound</th>
<th>Structure</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myrcene</td>
<td><img src="image" alt="Myrcene" /></td>
<td>Sedative, Anti-inflammatory, Analgesic</td>
</tr>
<tr>
<td>Limonene</td>
<td><img src="image" alt="Limonene" /></td>
<td>Anxiolytic</td>
</tr>
<tr>
<td>D-Linalool</td>
<td><img src="image" alt="D-Linalool" /></td>
<td>Anxiolytic, Sedative, Analgesic</td>
</tr>
<tr>
<td>B-Caryophyllene</td>
<td><img src="image" alt="B-Caryophyllene" /></td>
<td>Anti-inflammatory, CB2 agonist</td>
</tr>
</tbody>
</table>
Indications for use

Medical marijuana helps senior sleep, contend with other problems of aging

A Solution to the Opioid Crisis?
CTV National News: Easing end of life pain

Cannabis and Alzheimer's Disease

HEALTH NEWS | Wed Jul 6, 2016 | 11:09pm EDT

Seniors with access to medical marijuana use fewer prescription drugs

New Study: CBG Cannabinoid Works As Appetite Stimulant
Marijuana.com (blog) - Aug 11, 2016
New Study: CBG Cannabinoid Works As Appetite Stimulant ... Found to work synergistically with CBDA and THC, the CBG compound has ...
The Opioid Epidemic

• 2017 National survey of Canadian patients registered to purchase cannabis from federally licensed producer
  • High self-reported use of cannabis as a substitute for prescription drugs notably opioids and benzodiazepines

• Recreational cannabis legalization and opioid-related deaths Colorado 2000-2015
  • Analysis showed statistically significant reduction in opioid-related deaths following legalization of cannabis
Existing opioids

Cannabis

cannabinol (CBD)
Sleep

- No RCTs comparing cannabis to pharmaceutical sleep aid medications
- A number of clinical trials point to potential benefit of cannabis in the treatment of sleep difficulties associated with chronic pain
Cannabis in Dementia

• 2015 RCT trial looking at 1.5 mg of THC based cannabis administered three times daily and its effects on behaviours
• 2015 Open-label, pilot study examined 11 patients with dementia with BPSD and administered cannabis oil containing THC
• 10 patients completed study and both CGI and NPI scores were reduced
Identifying suitable patients

- Screening Questionnaire
  - Clinical history of presenting problem
  - Previous medications tried
  - Psychiatric history
  - PMHx/Medication history
  - Cannabis history
  - Social history
  - Functional history/Cognition
  - Drug and alcohol history
Who NOT to prescribe to:

• **Contraindicated in:** active **ischemic heart disease** and **psychosis** (except CBD-predominant strains)

• **Systolic blood pressure <100** as cannabis may lower blood pressure by as much as 40 points

• Atrial fibrillation with **unstable INR** and rapid heart rate as cannabis can worsen
Clinical Case

• Living independently in the community with once weekly PSW services to assist with bathing
• No history of active heart disease, atrial fibrillation, and SBP range (130-140)
• Cognition is intact at baseline
• History of previous falls
• Relies on public transportation
Clinical Case

- Mr. Payne has tried conservative measures as well as surgical intervention for his degenerative disc disease
- PMHx and medication history reviewed
- He has low risk for adverse effects and thus considered for trial of cannabis

**Suggested strain type:**
- high in CBD and low THC
Routes of Administration

Cannabis/Marijuana

Inhalation
- Smoking
- Vaporizing

Oral
- Oil
- Capsule
- Baked Goods

Onset: rapid, within minutes
Effects last 1 to 3 hours

Onset: slow, 30 to 90 minutes
Effects last 6 to 8 hours
Different Tokes for Different Folks

- No set guidelines for dosing or choosing formulations
  - **Start low and go slow**
- Acute/daytime symptoms $\rightarrow$ vaporized cannabis
- Chronic/nighttime symptoms $\rightarrow$ cannabis oils
Inhalation

- THC is detectable in plasma seconds after inhalation with peak plasma concentrations being measured 3-10 minutes after onset of smoking.
Smoking Vs. Vaporization

<table>
<thead>
<tr>
<th>Smoking</th>
<th>Vaporizing</th>
</tr>
</thead>
<tbody>
<tr>
<td>More Common</td>
<td>Vaporizer can be difficult to use</td>
</tr>
<tr>
<td>Toxic Biproducts</td>
<td>Significantly less biproducts</td>
</tr>
<tr>
<td>Chronic use associated with respiratory symptoms</td>
<td>Decreased respiratory symptoms</td>
</tr>
<tr>
<td>May mix with tobacco increasing cancer risk</td>
<td>Uses less cannabis product</td>
</tr>
<tr>
<td>Uses more cannabis product</td>
<td></td>
</tr>
</tbody>
</table>
Vaporization

- Cost: $100-600 for a vaporizer
- Pre-heat between 160-230 degrees F
- Grind cannabis (0.1 g – 1g) until very fine and place into the vaporizer
- Start with 1 inhalation and wait 15 min
Ingestion

• With oral use absorption is slow and erratic resulting in maximal plasma concentration after 60-120 mins
Cannabis oils

• Convenient
• Start low at 0.2 ml and place directly on tongue
• Recommend initial use to be in the evening
• Increase dose by 0.1 ml every day or every other day
Cannabis capsules

- Licensed producers starting to carry cannabis capsules
- Nabilone
  - Synthetic cannabinoid (THC) agonist
  - Approved indication: Chemotherapy anti-emetic
  - Off label indications → chronic non-cancer pain, fibromyalgia, fatigue, and sleep
  - Start with doses of 0.25 mg po hs and titrate gradually
## Inhalation vs. Ingestion

<table>
<thead>
<tr>
<th>Smoking/Vaporizing</th>
<th>Oral Ingestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faster onset of action</td>
<td>Longer onset of action — sometimes up to 3 hours!!</td>
</tr>
<tr>
<td>Lasts 2-4 hours</td>
<td>Lasts 6-8 hours</td>
</tr>
<tr>
<td>Good for breakthrough pain</td>
<td>Less odor, discrete, convenient to use</td>
</tr>
<tr>
<td>Vaporizers can be expensive and difficult to use</td>
<td>Titration challenge due to onset of action</td>
</tr>
</tbody>
</table>
Adverse Effects

- 3 D’s - dry mouth, dizziness, drowsiness
- Change in appetite
- Psychoactivity (THC)
- Perceptual alternations (eg. Depth)
- Headache, and changes in bowel habits
- Short-term memory and attention impairment (high THC)
- Palpitations and increase in heart rate by 20-50%
- Postural hypotension
Clinical Case

- **Route: Oral cannabis oil**
  - Convenient and easy to administer
  - Longer duration of action may lead to decrease use of PRN opiates
  - Sleep latency and staying asleep
The Medical Document

- **Medical document = prescription**
- **Components:**
  - Quantity of cannabis in grams used per day
  - Duration of use, cannot exceed 12 months
- THC/CBD percentages and indication are optional but recommended to guide dosing
- Recommend to specify oil vs dried product
Medical Document Authorizing the use of Cannabis for Medical Purposes under the Access to Cannabis for Medical Purposes Regulations

Help on accessing alternative formats, such as Portable Document Format (PDF), Microsoft Word and PowerPoint (PPT) files, can be obtained in the alternate format help section.

For related information, please see Health Canada’s Information for Health Care Practitioners.

This document may be completed by the applicant’s health care practitioner as defined in the Access to Cannabis for Medical Purposes Regulations (ACMPR). A health care practitioner includes medical practitioners and nurse practitioners. In order to be eligible to provide a medical document, the health care practitioner must have the applicant for the medical document under their professional treatment. Regardless of whether or not this form is used, the medical document must contain all of the required information, (see in particular s. 8 of the ACMPR).

Your health care practitioner may use this form to provide you authorization to use cannabis for medical purposes. Your health care practitioner may use a different form, but the required information as per section 8 of the ACMPR (outlined below) must be included.

Access via Health Canada licensed producers: Should you choose to access cannabis from a licensed producer, this form must be sent directly to the licensed producer of your choice. You may choose any licensed producer who is authorized to sell to registered clients. Please see the Health Canada website for a list of licensed producers. Should you wish to switch from one Health Canada licensed producer to another a new medical document will be required as licensed producers are required to keep the original medical document on file.

Access via production for own medical purposes: Should you choose to produce your own cannabis, or designate someone to produce it for you, the original of this document must be sent to Health Canada with your Registration Application Form.

Patient’s Given Name and Surname: __________________________

Patient’s Date of Birth (DD/MM/YYYY): __________________________

Daily quantity of dried marihuana to be used by the patient: ________ grams / day

The period of use is ________ day(s) or ________ week(s) or ________ month(s).

Note: The period of use cannot exceed one year

Health care practitioner’s given name and surname: __________________________

Profession: __________________________

Health care practitioner’s business address: __________________________
# Cost

<table>
<thead>
<tr>
<th>Dry Product</th>
<th>Oil</th>
<th>Capsules</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5-15/g</td>
<td>$50-200 per bottle</td>
<td>$100-200 for 60 capsules</td>
</tr>
<tr>
<td>Using 1g/day x30 days = $150-450</td>
<td>1 Bottle can last 1-3 months</td>
<td>Use 1-2 capsules/day 1 month supply = $100-400</td>
</tr>
</tbody>
</table>
Product Delivery
Monitoring

- It can between 2-3 weeks to obtain cannabis product
- Follow-up is recommended after 2-4 weeks
- Follow-up questions:
  - Quantity and strain type (% of THC/CBD)
  - Dose schedule
  - Therapeutic benefit
  - Adverse effects (falls?)
  - Cost
  - Effects on cognition**
Clinical Case - Follow-up

• Mr. Payne returns for follow-up 3 weeks later and reports using cannabis oil daily in the evening
• Mr. Payne reports improvement in pain symptoms and in sleep quality
• He denies recent falls, changes in memory, and has not been to the ER since
• Reports dry mouth as a side effect
<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Hydromorphone Contin 24 mg po BID</td>
<td>1. Hydromorphone Contin 21 mg po BID</td>
</tr>
<tr>
<td>2. Hydromorphone 2mg po QID</td>
<td>2. Hydromorphone 2 mg po TID (from QID)</td>
</tr>
<tr>
<td>3. Hydromorphone 1mg po q6 hr prn</td>
<td>3. Hydromorphone 1mg po q6 hr prn</td>
</tr>
<tr>
<td>4. Duloxetine 90 mg po daily</td>
<td>4. Duloxetine 90 mg po daily</td>
</tr>
<tr>
<td>5. Gabapentin 300 mg po qam, noon and 600 mg po qhs</td>
<td>5. Gabapentin 300 mg po qam, noon and 600 mg po qhs</td>
</tr>
<tr>
<td>6. Nortriptyline 10 mg po qhs</td>
<td>6. Nortriptyline 10 mg po qhs</td>
</tr>
</tbody>
</table>
Take home points

• Cannabis can be a suitable option
• Compounds of cannabis: THC and CBD
• Several strain types with variable percentages of THC and CBD
• Dosing is individualized and patients/caregivers must be educated to self-titrate to find the lowest effective dose
• Cannabis is offered through Licensed Producers as dried product and ingestible oils
Take home points

• A medical document (prescription) is completed and sent to the Licensed Producer
• Most of the evidence surrounding cannabis for ‘geriatric issues’ is considered low quality
• Vast amount of anecdotal evidence to support its use
• More research needs to be conducted in order to better understand the therapeutic properties of cannabis in clinical practice.
Resources

• www.drcarolinemaccallum.com
• http://www.ejinme.com/article/S0953-6205(18)30004-9/pdf

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Review Article

Practical considerations in medical cannabis administration and dosing

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