What physicians need to know about prescribing medicinal cannabis

Objective:
Medical doctors practicing in Canada and, indeed, many parts of the world today are receiving more requests for advice on medical cannabis. As the scientific research is rapidly building an enormous amount of new data on what is now termed the endocannabinoid system, this information is spreading to medical doctors, professionals
and the layperson. People tired or unresponsive to prescription medication are turning to natural types of medicine and cannabis may soon take the lead in the number of requests to physicians. The following document is intended to clarify and answer many of the questions that doctors may have about prescribing natural cannabis.

Scope:
For more than five years our research team has been observing and accumulating data
on the cannabis use of some four thousand people who receive the herb for medical purposes from Compassion Societies in British Columbia, Canada. Of these, roughly 70% are managing chronic pain, another 40% are Hepatitis C or HIV positive, maintaining compliance to anti-viral medications and smaller percentages, for bowel inflammation, seizure disorder and addiction withdrawal. These numbers speak to the general trend for medical cannabis use with the largest majority using cannabis to relieve chronic pain, and frequently associated mood disorders. We are confident that most physicians will see roughly the same percentages in their requests for medical cannabis information. That is, most patients will be requesting cannabis for pain and mood management.

MMAR:
Allowing access to natural cannabis may often prove to be a frustrating experience for
the treating doctor as well as the patient. Legal access is provided through Health Canada's Medical Marijuana Access Regulations (MMAR), this process requires the doctor to fill in the patient's diagnosis, plus recommend a weight of cannabis per day. Where many physicians get stumped, is how much cannabis does a person require to relieve their symptoms?

THC AVERAGES:
Over three years various lots of raw material that were to be consumed by members of the Society were randomly tested for heavy metals, pathogenic bacteria, plus yeasts and molds, pesticides and importantly, the concentrations of the three most abundant cannabinoids (actives) were determined. The accumulated data on average tetrahydrocannabinol (THC), cannabidiol (CBD), and cannabinol (CBN) amounts distributed to members of the Society are listed below.

THC + THC-A (total THC)	172 ($\pm$ 26) mg/gram
CBD + CBD-A (total CBD)	5.6 ($\pm$ 3.1) mg/gram
CBN + CBN-A (total CBN)	5.1 ($\pm$ 3.2) mg/gram

n = 30

These averages represent the usual potency of cannabis available in British Columbia
and also reflect those found in other parts of the world where cannabis is commercially available. What these numbers show is the average percentage of the most abundant cannabinoids. Of the 30 samples selected from the Society the mean percentage was 172 mg/gram or 17.2%, THC. This number may seem high considering the cannabis supplied by Health Canada is standardized to 12.5 $\pm$ 2% or, roughly, 125 mg/gram. However the Compassion Clubs obtain cannabis from a number of contracted growers, plus utilize more than one strain of cannabis, unlike Health Canada, and therefore see a wider range of active concentrations.

Nevertheless, the point being made is that most physicians should feel safe in assuming the average THC concentration of cannabis available to their patients would be in the 15% range or approximately 150 mg of THC per gram. Similar approximations can be made for CBD and CBN of around 5 mg per gram. Important here is the difference in smoked vs. oral ingestion of cannabis.

Review of the literature on smoked cannabis provides an average ingestion of THC consumed when smoking. Here a good rule of thumb is that 20% of the available THC is ingested during smoking, the other 80% is lost to atmosphere or pyrolysis. Therefore, of the normal 150 mg/ gram of THC available, the patient would ingest roughly 30 mg from 1 gram of smoked cannabis, but since most cannabis cigarettes are normally in the 0.5 gram range, this would be approximately 15 mg per dose.

If we go with these ballpark numbers we can estimate how much cannabis a person will require per day to maintain, for example, pain relief.

Dosing:
An important primary consideration is that the amount of THC an individual requires depends much more on their geneaology, than on body weight. In fact, we have never found any correlation between dosing and body weight. On the other hand, a person of British Celt derivation (Scottish, Irish or Welsh) frequently demonstrates a much higher (3 –5 times greater) tolerance to cannabis than a person of middle European or Asian decent. This phenomenon repeats itself time and time again with the members of the Compassion Club, under study, and has become a key starting point, for determining how much cannabis a person requires. The Celts require more.

We have recently had two studies accepted for publication (1 and 2) in a British medical journal, where, firstly an individual suffering from severe chronic pain syndrome was able to achieve sufficient pain relief to carry on a near normal life using only cannabis, plus some natural supplements for pain management. This person (male) requiring an average daily intake of 500 mg of THC, had a Scottish mother. A similar finding was made where a person (female) with progressive multiple sclerosis, also of Scottish descent, required 400 –500 mg THC, as cannabis, per day. This sort of dosage would translate, at an average of 15% THC concentration per gram of cannabis, to 16.6 grams per day. That's if it's all smoked. Reminding that most persons will only receive 20% of the available THC when smoking.

In both of these studies the Society members involved, consumed much of the cannabis as standardized oral dosages in the form of capsules. This type of administration can significantly decrease the amount of cannabis consumed in a day, for two reasons.
First cannabis to be ingested orally the THC is not lost to atmosphere by the method of preparation or administration. And the second is that once an oral dose is administered the individual does not feel the need to smoke cannabis.

Activation:
The problem that arises with oral consumption is that before administration the cannabis must be activated by decarboxylation of the THC, CBD and CBN, as the major actives. The numbers in the table above, show values for the decarboxylated form (e.g. THC) plus the carboxylated (e.g. THC-A) form of the active molecules, together. Summing the two gives the total available THC potential. Decarboxylation is an extremely important concept in understanding what defines an efficacious oral preparation as opposed to one that has little or no effect. In order to achieve complete decarboxylation of cannabis the person preparing the cannabis must determine the correct time and temperature (and pressure) to efficiently convert the molecules to their active form. Regardless, most individuals, given some research on the topic and practice, can prepare oral cannabis products, in their kitchens, that provide suitable efficacy. And, given complete and efficient decarboxylation greater than 90% of the THC, CBD and CBN can be ingested, significantly cutting grams of cannabis required and cost.

Strain specificity:
Another important factor in recommending cannabis to a patient is strain specificity.
There are two sub-species of cannabis, Indica and Sativa. These indicate the efficacy of the plant, in that Indicas are as a rule more sedative and the Sativa's more, stimulatory.
Since they are not individual species they inter-breed creating many strains of cannabis and, interestingly, each strain holds a different pharmacology. In this light, the strain that is chosen for specific symptom relief is important. Since this manuscript, so far, has focused primarily on chronic pain we will not deviate in stating that persons managing chronic pain choose, for the most part, Indicas. Of the

members with chronic pain at the Society, the vast majority prefer, high THC, high CBD, and low CBN. This is an Indica characteristic.

Most persons with chronic pain or chronic pain syndrome will dose orally every 4 to 6 hours. Effects are realized in 60 to 90 minutes and occurs in a plateau-like fashion rather than cyclical, as occurs with smoking. Patients with severe chronic pain often find oral administration most efficacious and will smoke for breakthrough pain.

We will detail other types of oral administration in a later post.
In the interim, we would greatly appreciate any questions and comments from medical professionals.

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References:

1.) Cases Journal 2009, 2:7487 doi: 10.1186/1757-1626-2-7487

2.) Cases Journal 2010, 3:7 doi:10.1186/1757-1626-3-7

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Repeated phenomena, led to many of our conclusions, but we believe these, render the truth.