

# A review for Australian nurses: Cannabis use for anti-emesis among terminally ill patients in Australia

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## KEY WORDS

Medicinal cannabis; symptom management; antiemetic drug; nursing care; palliative care; cannabinoids.

## ABSTRACT

### Objective

The objective of this article is to describe the potential benefits of medicinal cannabis in emesis control and the position of nurses looking after palliative patients who are on medicinal cannabis treatment in Australia.

### Setting

Palliative care

### Primary argument

Cannabis is the most commonly abused drug and its use for medical purposes was restricted throughout the world since the early 20th century. However many clinical studies show that the natural cannabinoid compounds can stimulate the cannabinoid receptors in the brain leading to attenuation of signal transmission, resulting in alleviation of the vomiting stimuli. The debate about the use of cannabis as an anti-emetic agent in patients with life-limiting conditions has renewed interest in recent years. The principle of palliative care is to improve the quality of life of patients living with life-limiting conditions based on the best evidence available. Although some evidence suggests cannabis may have therapeutic effects on some palliative patients and the Australian Commonwealth Government has recently changed the legislation, the concept of using medicinal cannabis in emesis control is very new to many Australians including the health care providers.

### Conclusion

In comparison to conventional medications, medicinal use of cannabis in palliative care is a new phenomenon and nurses as well as general public may be less prepared for the use of cannabis as a medical modality in all clinical settings. This review is intended to raise awareness of the physiological mechanism of cannabis and its medicinal use to the nurses in Australia.

## INTRODUCTION

The concept of cannabis use in medicine is not new and it can be tracked back to ancient times (Borgelt et al 2013). In the early 20th century, there was a rise in its use for the euphoric effects. As a result, cannabis became a prohibited drug and its use for medical purposes was also restricted around the globe (Alexandre 2011). However many clinical studies show that the natural cannabinoid compounds can stimulate the cannabinoid receptors in the brain leading to attenuation of signal transmission, resulting in alleviation of the vomiting stimuli (Sharkey et al 2014; Borgelt et al 2013; Johannigman and Eschiti 2013). The debate about the use of cannabis for medical purposes has remerged in recent years. Currently, the use of synthetic cannabis for certain medical conditions has been legalised in Canada, New Zealand, eight European countries and 23 states in the United States of America and Washington DC (Penington 2015; Borgelt et al 2013). In Australia, the amendment of the Narcotic Drugs Act 1967 (Cth) in February 2016 allows the cultivation and access of cannabis for medicinal and scientific uses by licensed individuals.

This literature review aims to describe the potential benefits of medicinal cannabis in emesis control and provides an overview of the current legislation and the position of nurses caring for patients who decide to use medicinal cannabis in Australia.

### Method of review

The literature search was undertaken in three electronic databases; PubMed, CINAHL and MEDLINE in October 2015. The various combinations of search terms cannabis, humans, vomiting, anti-emetic agent, dronabinol, nabilone, cannabinoid receptors, medicinal cannabis, legislation, laws, Australia, palliative care and health care providers aimed to capture the articles in relation to the medicinal use of cannabis as an anti-emetic agent. In addition, reference lists from the articles were also used to identify the relevant literature for this review.

### Effects of cannabis in humans

Emesis is a complex neurological reflex leading to ejection of possibly poisonous material from the gastrointestinal tract, and nausea serves as an unconditioned stimulus to learn that the particular food should be avoided in the future (Sharkey et al 2014). Since neural control of nausea and emesis uses the endocannabinoid system, use of cannabis as an antiemetic could be justified for its stimulation of the endocannabinoid system.

The vomiting centre consists of several brainstem nuclei that receive input from the gastrointestinal tract or from brain areas that continuously monitor the blood for noxious chemicals. Stimulation of these areas leads to the complex motor reflex that causes retching and emesis to eject from the body the possible source of poisoning (Horn 2008). These areas contain cannabinoid receptors CB1 and CB2 (Sharkey et al 2014; Mackie 2005). Stimulation of receptors by natural cannabinoids (endocannabinoids: 2-arachidonoglycerol and anandamide) leads to attenuation of signal transmission, resulting in alleviation of the vomiting stimuli (Sharkey et al 2014).

It is through the stimulation of cannabinoid receptors in these areas that consumption of cannabis exerts its anti-emetic effects, a well-known effect of cannabis consumption that continues to draw people with chronic nausea to its use. The most abundant cannabinoid in cannabis,  $\Delta^9$ -Tetrahydrocannabinol (THC), is a partial CB1 agonist that when administered to cancer patients, suppress the experience of nausea and vomiting (Voth and Schwartz 1997). It is the most abundant but also most psychoactive derivative of cannabis. The other important active molecule, cannabidiol (CBD), is a non-psychoactive cannabis derivative that has not been investigated for its antiemetic properties, but appears to potentiate the antiemetic properties of THC when administered in a 1:1 ratio (Sharkey et al 2014).

Nausea, as the sensation that precedes vomiting, is less well understood. Nausea centres reside in the forebrain, but activation of insular cortex during nausea links this area to the vomiting (Sharkey et al 2014). The insular cortex contains CB1 receptors (Mackie 2005), making it susceptible to the inhibitory effects of endocannabinoids and plant-derived cannabinoids, giving the latter the anti-nausea properties.

While the above makes cannabis or its derivatives suitable antiemetic alternatives, the presence of cannabinoid receptors is not limited to the vomiting and nausea centres (Mackie 2005). Other neurological effects of cannabis use are mild euphoria, sedation, relaxation, hunger and sensory input enhancement, making it a drug for 'recreational use', despite other non-desirable effects such as impaired attention, balance, cognition, judgement, memory and sense of time, as well as anxiety, disorientation, paranoia and psychosis (Borgelt et al 2013). These effects reflect the widespread presence of cannabinoid receptors in the brain, making all of them susceptible of stimulation by externally supplied cannabinoids.

Despite these undesirable effects, there is potential use of cannabis use in a medical context, specifically in palliative patients suffering from chronic terminal illnesses. While cannabis can cause addiction, it is ranked less addictive than tobacco, alcohol and another antiemetic drug also used for recreational purposes, ketamine (Nutt et al 2007). Furthermore, the physical harm caused by cannabis, both acute and chronic, is also ranked below these three substances (Nutt et al 2007). The benefit of nausea and emesis suppression in the late stages of life may outweigh the risk of addiction or psychosis.

It is important to note that the active cannabinoids concentration may vary up to three-fold in different strains (Borgelt et al 2013; Barni-Comparini et al 1984). Therefore, determining the dose and route of administration can pose several problems. To add complexity, the route of administration determines both absorption time, from a few minutes for smoked THC, to 30 minutes for oral THC. In addition, the bioavailability ranges from 2-56% for smoked THC and 5-20% for oral THC with a peak concentration reached anywhere between one and three hours after ingestion (Huestis 2007). The two variables of quality and route administration make titration very difficult in individual patients, when also considering the possible co-morbidities such as respiratory deficiencies that would contraindicate smoked cannabis, or gastric problems that delay oral absorption.

## **CURRENT MEDICINAL CANNABIS LEGISLATION IN AUSTRALIA**

The Narcotic Drugs Amendment Bill 2016 (Cth) facilitates the production of medicinal cannabis products for specified patients under clinical care in Australia. Access to any cannabis products manufactured under this national licensing scheme is the joint responsibility, with supply being controlled by provisions under the Therapeutic Goods Act 1989 (Cth) working in conjunction with State and Territory drugs and poisons legislation.

An interim decision by the Therapeutic Goods Administration's Advisory Committee on Medicines Scheduling has rescheduled medicinal cannabis from a Schedule 9 to Schedule 8 (Therapeutic Goods Administration 2016). This means medicinal cannabis is available for clinical care, with restriction on the cultivation, manufacturing, supply, distribution, possession and use to reduce abuse and misuse. At the time of writing, both Poisons and Therapeutic Goods Amendment (Designated Non-ARTG Products) Regulation 2016 in New South Wales and Access to Medicinal Cannabis Act 2016 in Victoria allow restricted access to medicinal cannabis produced under this national licensing scheme once it becomes available. Other states and territories are currently in the process of developing legislation and schemes covering restricted access.

### **The position of Australian nurses caring for patients on medicinal cannabis treatment**

The principle of palliative care is to improve the quality of life of patients living with life-limiting conditions based on the best evidence available (World Health Organization 2015). Although some evidence suggests cannabis-based drugs, including dronabinol and nabilone, may have therapeutic benefits for some patients

with life-limiting conditions (Philipsen et al 2014; Green and De-Vries 2010), medicinal cannabis in emesis control is a very new treatment option available for Australians. In principle, nurses should act lawfully and comply with the professional standards as set out by the Nursing and Midwifery Board of Australia when caring for patients with life-limiting conditions who are using or want to use cannabis as a treatment modality for symptom management. In addition, nurses should:

- support the evidence based practice and clinical research in medicinal cannabis. The non-medicinal use of cannabis and its negative effects on humans have been well documented since 1930s, but its pharmaceutical effects, in particular, the long-term medicinal benefits have not yet been adequately explored (Philipsen et al 2014; Green and De-Vries 2010);
- be aware of and keep up-to-date with the changes in legislation and regulations in the medicinal use of cannabis. The regulations may be changed when more scientific evidence about its beneficial medical effects on humans becomes available in the near future;
- keep the patients and their carers informed and educated about the legislative change and therapeutic efficacy of cannabis. Under any circumstances, patients have the right to make informed decisions about their health care (Johannigman and Eschiti 2013);
- be involved in the review of the suspected risk in its clinical use (Johannigman and Eschiti 2013); and
- respect and support the patients who have chosen to use cannabis for symptom management such as anti-emesis (Philipsen et al 2014).

## CONCLUSION

Overall, in the context of palliative care, it is clear that patients with life-limiting conditions should receive the optimal treatments in order to improve their quality of life. In comparison to conventional medications, the use of medicinal cannabis in emesis control is a new phenomenon in palliative care. The information available in relation to the long-term therapeutic effects of cannabis and the contraindication with other drugs is very limited. Further research is required to explore the needs of patients who use medicinal cannabis for anti-emesis and their experience in receiving cannabis treatment in Australia.

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