Exploring the Evidence Base – ‘CBPMs in Psychiatry & Neurodiversity’

Tuesday 25th of November 2025

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Aims:

- Summarise the current evidence base for CBPMs in psychiatry and neurodiverse populations.
- Recognise potential therapeutic benefits and limitations in conditions such as anxiety, PTSD, ADHD, and autism.
- Explore real-world examples and lessons learned from clinical practice.
- Consider ethical and safety challenges when prescribing CBPMs for vulnerable patient groups.
- Identify priorities for future research and clinical guidance in this field.

What are neurodevelopment conditions

Neurodevelopmental conditions are a group of disorders that affect the development and functioning of the brain and nervous system. These conditions typically emerge during childhood and can impact areas such as behaviour, learning, communication, and motor skills.

Examples include ;

-Autism
-Attention deficit hyperactivity disorder (ADHD),
-Dyslexia, dyspraxia, and intellectual disabilities
-OCD

The causes can be genetic, environmental, or a combination of both, and the severity and specific challenges can vary widely among individuals.
Linked conditions include `PTSD, Anxiety, depression and insomnia. Fibromyalgia and hormonal related problems in women

Evidence base

Challenges of double-blind placebo controlled trials.
Heterogeneity of conditions and CBMPs

Mixed reports

The differential effects of medicinal cannabis on mental health: A systematic review- De Bode et al

Included diagnoses were anxiety disorders, tic disorders, autism spectrum disorder, attention-deficit hyperactivity disorder, obsessive-compulsive disorders, anorexia nervosa, schizophrenia, psychosis, substance use disorders, insomnia, and bipolar disorders.

Cannabinoids for Anxiety

- The earliest study (Fabre & McLendon, 1981) examined **nabilone (a synthetic THC analogue)**. An open-label study with 5 participants and a 28-day RCT with 20 participants both found **significant reductions in total, somatic, and psychic anxiety** compared with placebo.
- A large, more recent RCT (Gundugurti et al., 2024) involving 178 participants with generalized anxiety disorder found that **nano-dispersible CBD significantly improved anxiety, sleep, depression symptoms, and clinical impressions** compared with placebo over 12 weeks.

Social Anxiety

- Most studies in this area used **CBD**:
- **Bergamaschi et al. (2011):** A single dose of 600 mg CBD reduced anxiety, cognitive impairment, and discomfort during a public speaking task compared with placebo. CBD-treated patients had anxiety levels closer to healthy controls.
- **Masataka (2019):** A 4-week trial using 300 mg CBD twice daily found **no group differences**, but **significant reductions within the CBD group** in anticipation anxiety and fear in social situations.
- **Kwee et al. (2022):** In 80 participants receiving exposure therapy plus CBD or placebo, CBD **did not improve outcomes** beyond placebo.
- Overall, most reviewed studies show **CBD can reduce social anxiety symptoms**, though results are mixed. One study found no effect versus placebo, while others showed improvements in specific anxiety domains. **THC-derived nabilone also showed anxiolytic effects**, despite THC's typically arousing profile. Risk of bias across studies ranged from high to low.

Cannabinoids for Insomnia

- Four RCTs were identified examining cannabinoids for insomnia. Two studies tested **combined THC–CBD formulations**, while two more recent trials investigated **CBD alone**.
- **THC + CBD Studies**
- **Ried et al. (2023):**
  • 29 participants received THC (10 mg/ml) + CBD (15 mg/ml) or placebo in a 2-week cross-over design.
  • The active treatment increased melatonin levels by 30% (vs. a 20% decrease with placebo).
  • Both groups improved in clinical insomnia classification, but the improvement was **greater in the cannabinoid condition**.
  • Light sleep increased by 21 minutes in the active group versus almost no change in placebo.
- **Walsh et al. (2021):**
  • 23 participants received THC (20 mg/ml) + CBD (1 mg/ml) + CBN (2 mg/ml) or placebo.
  • Self-reported sleep quality and clinical insomnia scores improved significantly with active treatment.
  • **Objective sleep (polysomnography)** showed **no differences** between conditions.
- **CBD-Only Studies**
- **Aiewtrakoon (2024):**
  • 45 participants received CBD (10 mg morning + 1 mg/kg evening) or placebo in a crossover design, then all received CBD for 12 weeks.
  • CBD improved multiple subjective and physiological sleep parameters: sleep duration, sleep onset latency, night awakenings, wake after sleep onset, daytime sleepiness, and overall sleep quality.
- **Narayan et al. (2024):**
  • 30 participants received 150 mg CBD nightly for 2 weeks after a placebo lead-in.
  • No consistent improvements were found in primary insomnia measures or secondary sleep outcomes.
  • However, **overall well-being** was higher in the CBD group throughout the study.
- **Overall Conclusion**
- THC–CBD combinations appear to improve **subjective** sleep measures but do **not** improve objective sleep (polysomnography).
  CBD alone shows **mixed results**: one study found broad improvements across sleep outcomes, while another found **no significant changes in insomnia symptoms**, though well-being improved.

Cannabinoids Across PTSD, OCD, ASD, and ADHD

Post-traumatic Stress Disorder (PTSD)

- Five studies evaluated cannabinoids for PTSD.

- **Nabilone (synthetic THC analogue).**
Jetly et al. (2015) found that nabilone (up to 3 mg/day) significantly reduced **nightmare frequency and intensity**, and improved global PTSD severity impressions and well-being, although broader sleep parameters did not improve.

- **CBD during trauma recall.**
Bolsoni et al. (2022a,b) showed that 300 mg oral CBD had **no effect** during initial trauma narration. During recorded trauma exposure, CBD attenuated **anxiety** and **cognitive impairment only in individuals with non-sexual trauma**, with no benefits in the sexual-trauma subgroup.

- **Whole-plant cannabis chemotypes.**
Bonn-Miller et al. (2021) found that THC-rich, CBD-rich, and balanced THC+CBD cannabis produced **no improvement** in PTSD symptomatology versus placebo.

- **Longitudinal medicinal cannabis use.**
A 12-month prospective study (Bonn-Miller et al., 2022) found that users of mainly THC-dominant cannabis showed a **steeper reduction in hyperarousal**, although total symptom severity improved similarly to non-users.

- **Summary:**
Cannabinoids show **specific** benefits (nightmares; trauma-induced anxiety; hyperarousal), but **no consistent effects** on global PTSD symptoms.

Attention-Deficit/Hyperactivity Disorder (ADHD)

Nabiximols (THC:CBD = 1:1).
A pilot RCT by Cooper et al. (2017) administered nabiximols or placebo for six weeks to 30 adults with ADHD. Primary outcomes were cognitive performance and activity level, with ADHD and emotional lability symptoms as secondary outcomes.

No significant improvements were detected on any primary or secondary outcome measure.

Summary:
Nabiximols did not improve cognitive, behavioral, or emotional outcomes in ADHD.

Self medicating. ADHD and lifetime cannabis use, with an odds ratio of 7.9 for cannabis use in those with ADHD compared with non-ADHD peers (95% CI: 3.72, 15.51, $P = 5.88 \times 10{-}5$)

Autism Spectrum Disorder (ASD)

Two RCTs evaluated cannabinoids for ASD.

Whole plant vs. purified extract (20:1 CBD:THC).
Aran et al. (2019) found that the isolate CBD+THC extract produced no improvements, whereas the whole-plant extract significantly improved disruptive behavior and social functioning. Findings suggest a potential entourage effect via minor cannabinoids/terpenes.

CBD-dominant extract (9:1).
Silva Junior et al. (2024) demonstrated improvements in social interaction, anxiety, psychomotor agitation, and meal acceptance compared to placebo. No effects were found for aggressiveness, sleep, speech, or global ASD severity. Concentration improved only in children with mild ASD.

Summary:
Cannabinoid effects in ASD are targeted, favoring anxiety, agitation, and social functioning rather than broad symptom reduction.

Obsessive–Compulsive Disorder (OCD)

Kayser et al. (2020) compared CBD-rich, THC-rich, and placebo cannabis in 14 adults.

All conditions—including placebo—reduced state anxiety, with placebo outperforming active cannabis at early timepoints. No improvements in OCD symptoms were observed, and THC increased intoxication, heart rate, and blood pressure.

Summary:
Cannabinoids did not improve OCD symptoms; anxiolysis appeared non-specific and THC induced unwanted physiological effects.

Project 21 (Lysnkey et al)

257 people with OCD

-Average of 2 CBPMs mainly THC dominant flowers

- Substantial improvements noted in QoL, general health, mood/depression and sleep

-Substantial reduction in anxiety

Integrated Conclusions Across All Conditions

Cannabinoids show limited but domain-specific therapeutic effects, with the strongest evidence for:

Nightmare reduction (nabilone in PTSD)

Acute anxiolysis during trauma recall (CBD in non-sexual trauma PTSD)

Hyperarousal reduction in naturalistic long-term cannabis users (PTSD)

Improved social functioning, anxiety, and agitation in ASD (especially whole-plant or CBD-dominant extracts)

No consistent benefits were found for:

Overall PTSD symptom severity

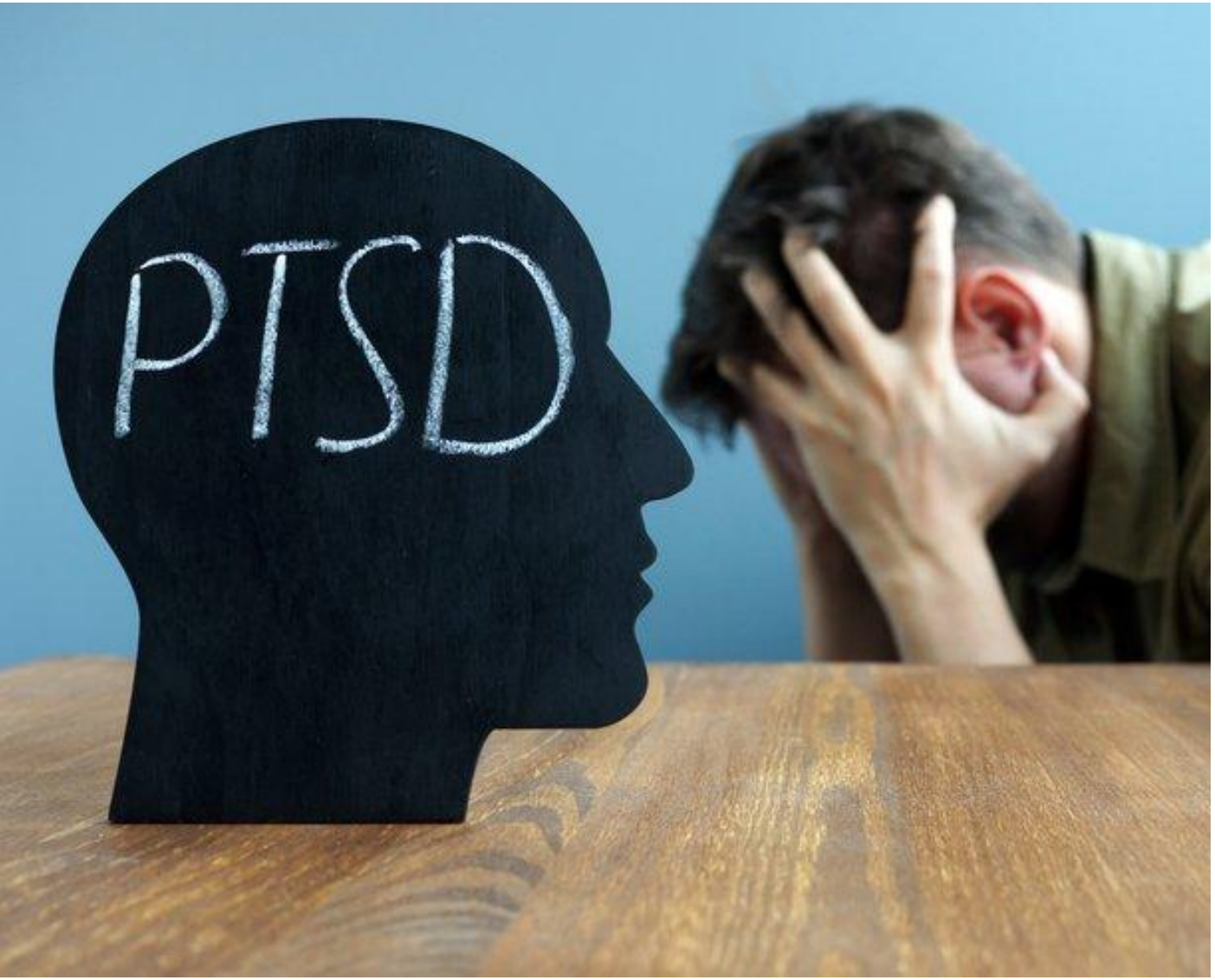
OCD symptoms

ADHD symptoms or cognition

Whole-plant extracts in ASD appear more effective than purified formulations, supporting possible entourage effects from minor cannabinoids/terpenes.

CBD tends to show anxiolytic and calming effects,
while THC frequently induces intoxication, cardiovascular side effects, and limited therapeutic gain across disorders.

Most studies had small samples, short durations, heterogeneity in cannabinoid formulations, and moderate-to-high risk of bias.



Medical Cannabis in Complex PTSD:

A Patient Case Study

INITIAL CONSULTATION: PATIENT PRESENTATION

- Patient self-referral for assessment of suitability for medical cannabis

- **Demographics**
- 28-year-old female

- **Medical History**
- Diagnosed with Emotionally Unstable PD . History of emotional, physical and sexual abuse in the family home. Currently lives alone

INITIAL CONSULTATION: ASSESSMENT FOR SUITABILITY

- **Presenting Symptoms**
- Recurrent thoughts of self-harm. History of cutting and overdoses
- Flashbacks
- Intrusive thoughts with hypervigilance.
- Secondary anxiety
- Initial and maintenance insomnia with nightmares
- **Diagnosis**
- Complex PTSD
- Emotionally Unstable Personality

MEDICATION HISTORY / CURRENT MEDICATION

- Sertraline, Citalopram, olanzapine in secondary care. Doesn't see a regular psychiatrist now only GP.

- **Current Medication:**
- Prescribed citalopram but doesn't take it.
- Has had private counselling.

- **Cannabis History:**
- Has been smoking cannabis since age of 15. Access can be a problem. Uses High THC strains.

STARTED PATIENT ON MEDICAL CANNABIS DRIED FLOWER

- **Daytime Medical Cannabis Flower**
- THC sativa 21%
- **Night- time Medical Cannabis Flower**
  - THC indica flower 21%

TREATMENT PLAN

- **Follow up after 1 month:**
- Reported improvements in terms of improved sleep and mood. Reduced anxiety and flashbacks and reduced nightmares. Improved quality of life. However, was using up to 1.5g-2g daily.

- **Treatment plan:**
- **Discussed introducing oils to reduce flower consumption**

TREATMENT PLAN - PATIENT STABILISED ON:

Daytime Medical Cannabis Oil

Balanced oil THC 25:CBD 25

1.5ml daily split

Night- time Medical Cannabis Oil

THC20:CBD1 (THC 20mg/mL, CBD 1mg/mL)

0.8ml at night

Total daily CBD dose = 38.5mg

Total daily THC dose = 53.5mg

MAINTENANCE

Regular prescription of :

CBD25:THC25 1.5ml during the day

THC20:CBD1 0.8ml at night

Plus vaporisation of dried cannabis flower when required

Total daily CBD dose = **38.5mg CBD**

Total daily THC dose = 53.5**mg THC**

TREATMENT PLAN

- **Follow up 1 month later:**

- Stable on oils and flower for breakthrough symptoms with much less consumption < 1g daily, but dose varies according to daily stressors.

- Improved quality of life and wants to work as an advocate for medical cannabis

- Medical Cannabis in ADHD and Anxiety: A Patient Case Study

Initial Consultation: Patient Presentation

Patient self-referral for assessment of suitability for medical cannabis

Demographics

- 32-year-old male

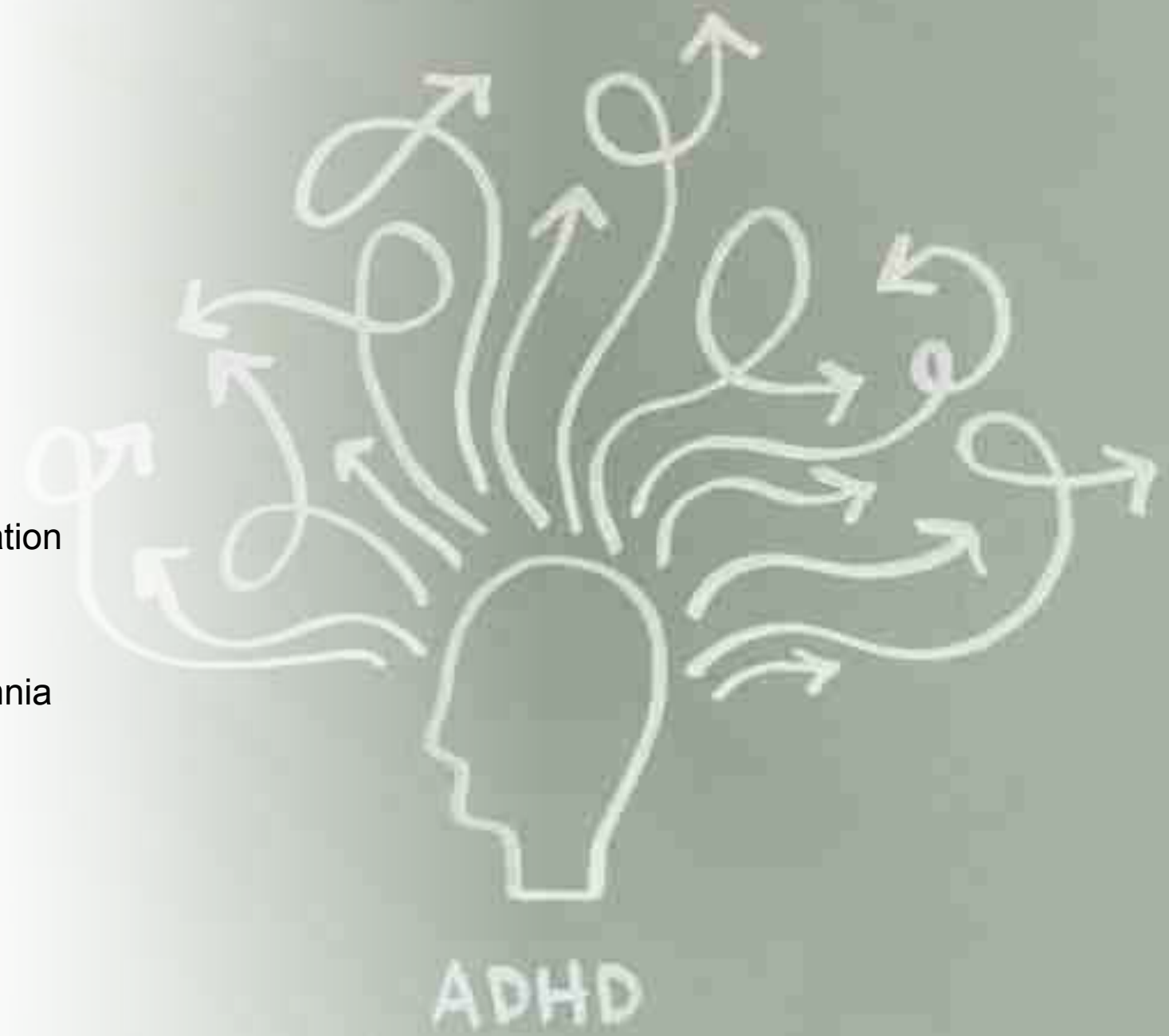
Medical History

- Diagnosed with adult ADHD 10 years ago
- Has always had difficulty since childhood, but managed and obtained GCSE's, A levels and attended university

Initial Consultation: Assessment for Suitability

- **Presenting Symptoms**
  - Inner restlessness
  - Racing thoughts
  - Impaired attention / concentration
  - Procrastination
  - Secondary anxiety
  - Initial and maintenance insomnia

- **Diagnosis**
  - Adult ADHD with secondary anxiety and insomnia



Medication History / Current Medication

•Past Medication:

- Methylphenidate (Concerta XL) – suffered adverse effects: headaches

•Current Medication:

- Lisdexamphetamine – helped with ADHD symptoms to some degree but felt ‘numbing effects’

•Cannabis History:

- Has been smoking cannabis since his late teens, up to 0.5g a day (strains unknown) when accessible and not daily.
- Sleep is poor without cannabis.

Started patient on a combination of medical cannabis oils and medical cannabis dried flower

Daytime Medical Cannabis Oil

CBD10:THC5 (CBD10mg/mL, THC 5mg/mL)

Night- time Medical Cannabis Oil

THC20:CBD1 (THC 20mg/mL, CBD1mg/mL)

Daytime Medical Cannabis Flower

- CBD10:THC10 flower

Night- time Medical Cannabis Flower

- THC indica flower

Example Titration Guide: Balanced CBD:THC Product [1]

Day	Dose 1 (mL)	Dose 2 (mL)	Total daily dose (mL)
1		0.25	**0.25**
2		0.25	**0.25**
3	0.25	0.25	**0.50**
4	0.25	0.25	**0.50**
5	0.25	0.25	**0.50**
6	0.25	0.5	**0.75**
7	0.25	0.5	**0.75**
8	0.25	0.5	**0.75**
9	0.5	0.5	**1.0**
10	0.5	0.5	**1.0**
11	0.5	0.5	**1.0**
12	0.5	0.75	**1.25**
13	0.5	0.75	**1.25**
14	0.5	0.75	**1.25**

Medical Cannabis Flower – Two Strengths:

CBD10:THC10 flower

High THC indica flower

- Flowers were prescribed for breakthrough symptoms only.
- Discussed this as a treatment trajectory and with a view to removing use of flower if possible and sticking to oils.

Daytime Medical Cannabis Oil

- CBD10:THC5 (CBD10mg/mL, THC 5mg/mL)
- 1.5ml daily

Night- time Medical Cannabis Oil

- THC20:CBD1 (THC 20mg/mL, CBD1mg/mL)
- 0.6ml at night

Total daily CBD dose = **15mg CBD**

Total daily THC dose = **19.5mg THC**

4 week follow up

Improvements in terms of focus and attention. Reduced restlessness. However, wanted to reduce flower consumption and therefore oil changed to CBD 12:THC 10

CBD12:THC10 medical cannabis oil 1.5ml daily divided into two doses

Total daily CBD dose = **18mg CBD**

Total daily THC dose = **15mg THC**

After a further 4 week follow up

- After a further 4 weeks even more improvement in terms of reduced anxiety, improved mood. Improved attention and concentration. Reduced restlessness. Benefitted his employment also. Improved relationships with his family.

Maintenance

Total daily CBD dose = 18mg CBD

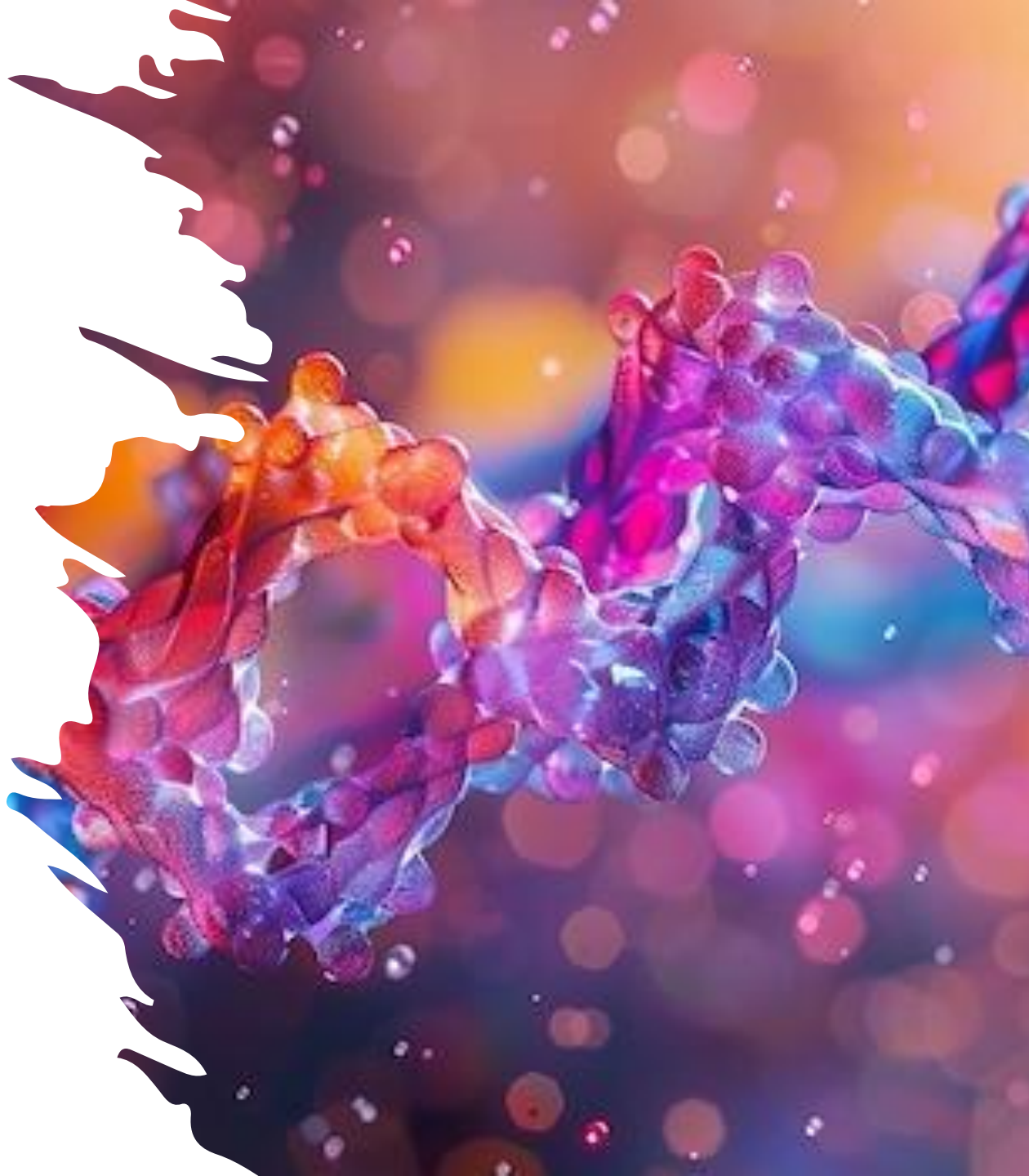
Total daily THC dose = 27mg THC

- Regular prescription of :
- CBD12:THC10 1.5ml during the day
- THC20:CBD1 0.6ml at night
- Plus vaporisation of dried cannabis flower when required

** Mental health and inflammation. Physical and psychological pain same pathways

Dorani and colleagues (2021) investigated hormone-related mood problems in 209 women with ADHD, finding that participants had high rates of co-occurring premenstrual dysphoric disorder, postpartum depression, and more severe climacteric (peri-menopausal, menopausal) symptoms than the general population.48 These studies suggest that cannabis products are potent analgesics in women with severe pelvic pain.

Practitioners should inquire about motivations for cannabis use, such as to help with sleep, anxiety, or physical pain. These symptoms may be more effectively treated by pharmacologic or behavioral interventions, which can be part of a treatment plan alongside reducing cannabis use. Changes in conventional medication regimens may be warranted.



Psychosis

- Pooled data from 162 studies (n ≈ 210,283 cannabis-exposed individuals) across observational, experimental (THC challenge) and medicinal-cannabis research. PMC
- The pooled rates of **cannabis-associated psychotic symptoms (CAPS)**:
    - ~19% in observational studies (95% CI ~14.2%–24.6%) PMC
    - ~21% in THC challenge (experimental) studies (95% CI ~11.3%–30.7%) PMC
    - Much lower (~1.5%) in medicinal cannabis studies (95% CI ~1.1%–1.9%) PMC
- Full-blown psychotic episode rate: ~0.52% (≈ 1 in 200) across all designs. PMC
- Predictors of increased CAPS risk included:
    - Administration of THC (single dose effect d ≈ 0.7) PMC
    - Pre-existing mental health vulnerabilities (e.g., bipolar disorder d ≈ 0.8) PMC
    - Younger age and female gender were modest predictors. PMC
- Some expected predictors (e.g., high-THC strain, early-onset cannabis use) did *not* reliably predict CAPS in meta-analytic models. PMC
- The medicinal cannabis samples tended to be older, have lower-THC/higher-CBD ratios, which may explain lower adverse-event rates. PMC
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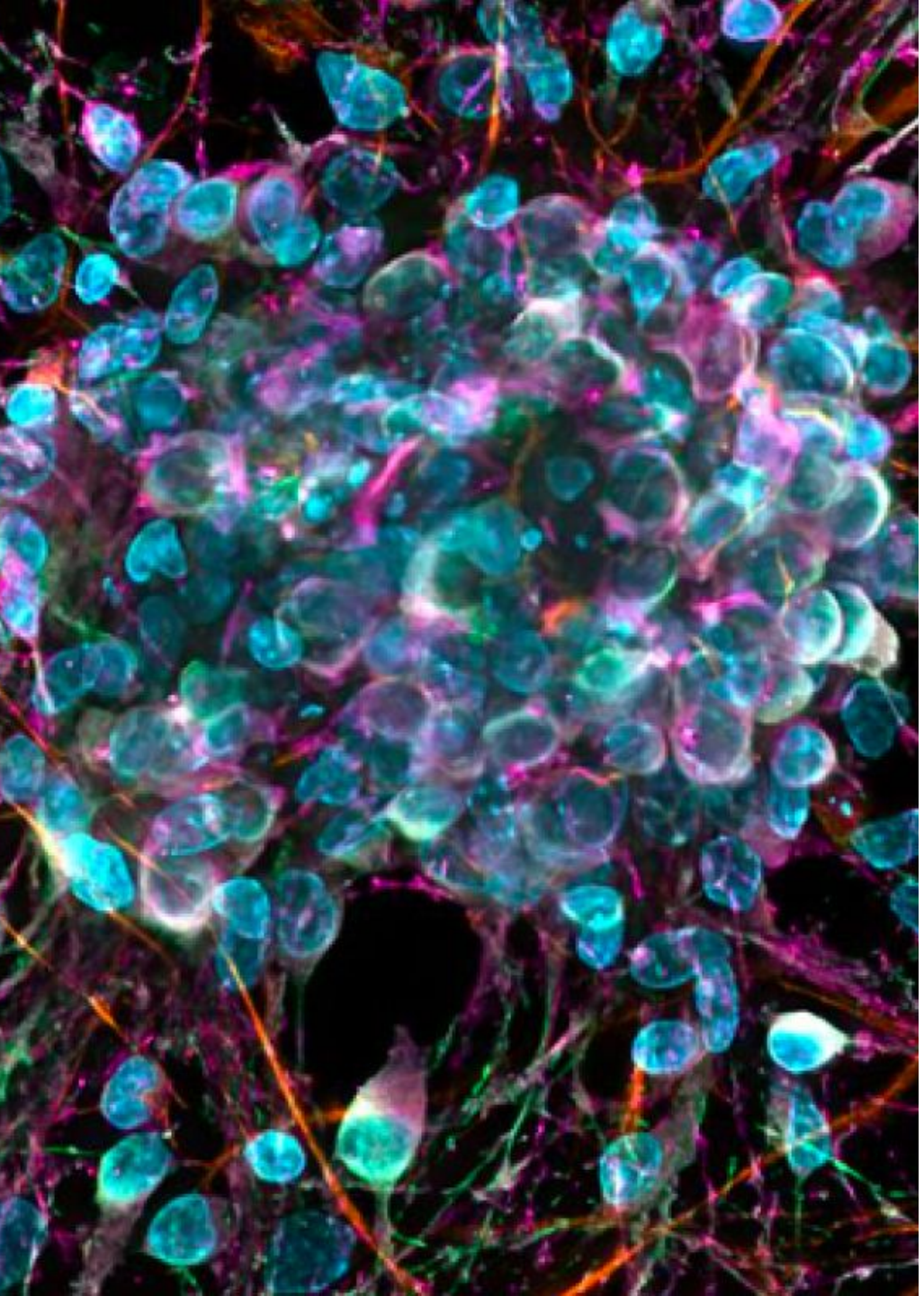
- It reinforces the **risk of adverse effects** (psychosis-like symptoms) with cannabinoid use, especially when THC is involved and in vulnerable populations.
- It suggests that **THC content and user vulnerability** matter significantly for safety.
- It highlights that even if cannabinoids show therapeutic benefits in certain domains (as we summarized earlier), they are **not without risk**, and these risks must be factored into any therapeutic claim or clinical recommendation.



The future

- ** More research needed on symptomatic improvement (or not)
- ** interplay with conditions. Autism and ADHD often co-exist along with other physical health problems.
- ** What CBMPs may be be beneficial for specific conditions/ Are there common themes?
- ** Personalised medicine through testing of the endocannabinoid system
- ** The role of inflammation and how CBMPs can influence this.

THANK YOU