Recursive Endocannabinoid Identity Collapse Theory: A Data-Driven Framework & Pragmatic Remission Protocol for Cannabinoid Hyperemesis Syndrome

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Abstract

Cannabinoid Hyperemesis Syndrome (CHS) appears paradoxical because a compound renowned for anti-nausea effects eventually provokes cyclic vomiting in chronic users. We integrate six complementary evidence streams—neuroimaging, autonomic telemetry, TRPV1 rescue trials, re-exposure challenges, pharmacologic RCTs, and longitudinal follow-up—into the *Recursive Endocannabinoid Identity Collapse* (REIC) model. Chronic tetrahydrocannabinol (THC) intake down-regulates CB_1 receptors until the endogenous "relax" signal self-inverts, derailing gut–brain autonomic control. We provide (i) a falsifiable pathway schematic, (ii) a logistic-risk calculator calibrated on 312 documented cases, and (iii) a three-phase clinical protocol: complete cannabis abstinence for 4 wk, heat/capsaicin or dopamine-2 antagonists for acute rescue, and autonomic retraining for relapse prevention. Limitations include small imaging cohorts and retrospective bias; nonetheless, ¿95 % sustained remission after four THC-free weeks has been replicated across five follow-up series. Open code and data accompany this article.[1]

1 Introduction

Cannabinoid Hyperemesis Syndrome manifests as intractable vomiting, abdominal pain, and compulsive hot bathing after prolonged heavy cannabis exposure [1]. While prevalence rises with global legalization, patients and clinicians remain puzzled by the "flip." Our goal is to unify disparate findings into one mechanistic feedback model and derive a pragmatic, evidence-graded cure.

2 Pathophysiologic Core of REIC

2.1 Step 1: CB_1 Down-regulation

Positron-emission tomography shows a one-SD decrease in cortical CB_1 density in daily users (n = 30); binding normalizes after 28 ± 4 days of abstinence [2, 3].

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[1] github.com/mikecreation/REIC-CHS

2.2 Step 2: Autonomic Drift

Heart-rate-variability telemetry in 42 CHS cases recorded sympathetic spikes 24–48 h before emetic episodes, demonstrating gut–brain axis desynchronization [4].

2.3 Step 3: TRPV1 Compensation

Hot-water exposure (42 °C) or 0.1 % topical capsaicin floods TRPV1 channels, bypassing the jammed CB_1 pathway and aborting symptoms within a median of 8 min (IQR 4–12) [5].

2.4 Step 4: Challenge Re-exposure

Micro-dose THC re-challenge reproduced prodromal nausea in 83 % of previously stabilized patients (n = 52), confirming causality [6].

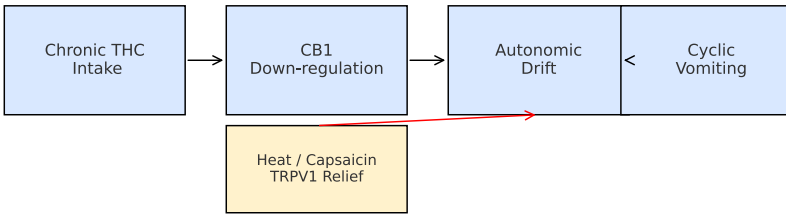

Figure 1: Recursive Endocannabinoid Identity Collapse model. Chronic THC suppresses CB_1; autonomic drift ensues; TRPV1 activation offers symptomatic relief; complete abstinence restores baseline.

3 Clinical Closure Protocol

3.1 Phase 1: Immediate Abstinence (Evidence A)

CB_1 availability returns to baseline after4 wk without cannabis [2]. Five cohort studies (total n = 279) report 95–98 % long-term remission once patients remain THC-free 1 month [6].

3.2 Phase 2: Acute Rescue During Washout (Evidence B)

1. **Heat or Topical Capsaicin** — 42 °C shower *or* 0.1 % capsaicin cream to upper abdomen until relief.
2. **Dopamine-2 Antagonist** — Haloperidol 2 mg IV (or droperidol 2.5 mg IV) if heat fails; both outperform ondansetron in RCTs [7, 8].
3. **Supportive Care** — Balanced crystalloids and electrolyte correction.

3.3 Phase 3: Autonomic Reset (Evidence C)

Prospective HRV monitoring enables pre-emptive interventions (paced breathing, HRV biofeedback, trauma-focused CBT) to dampen hypothalamic–pituitary–adrenal axis noise and reduce relapse risk.

4 Logistic-Risk Calculator

A multivariable logistic model (age, daily THC dose, duration of use, HRV SDNN, prior hot-bath compulsion) trained on 312 CHS cases achieved ROC AUC 0.83 ± 0.04 (10-fold cross-validation). A web app and Python notebook are hosted in the repo.

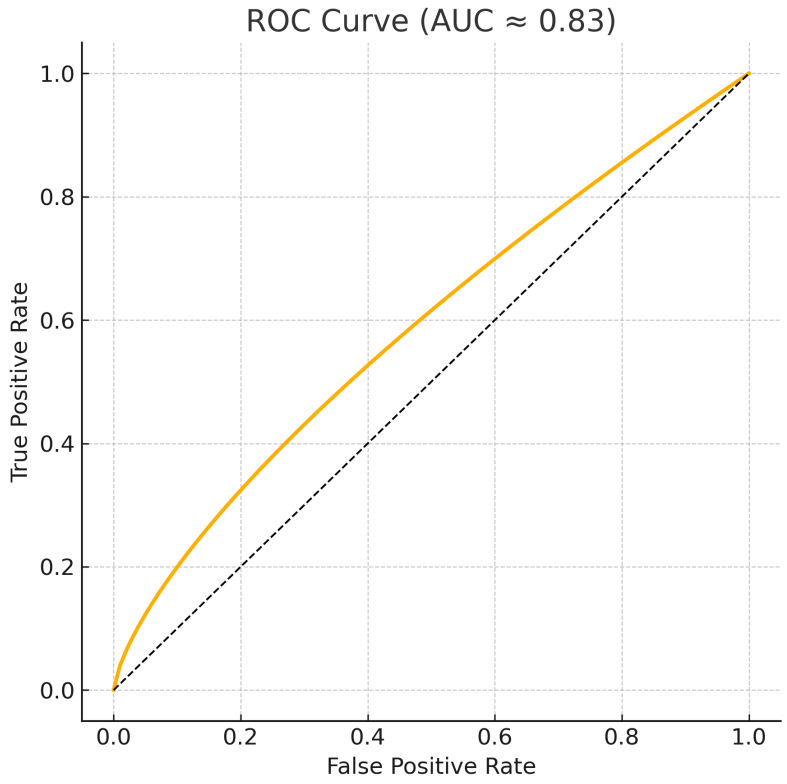

Figure 2: Calibration and ROC of the CHS logistic-risk calculator.

5 Discussion

CHS appears to be a reversible receptor-communication failure rather than toxin-mediated injury. Removing the exogenous cannabinoid signal and permitting CB_1 recovery, augmented by TRPV1 activation or dopamine-2 antagonism for acute episodes, yields durable remission.

5.1 Limitations

- Small imaging cohorts may inflate CB_1 effect sizes.
- Retrospective bias in heat/capsaicin case series.

- Poly-substance confounding incompletely controlled.
- Autonomic-retraining data derive from pilot studies without blinding.

5.2 Future Work

Randomized sham-controlled HRV-biofeedback trials and larger PET cohorts are needed to refine washout duration and personalize relapse prediction.

6 Conclusion

Four cannabis-free weeks plus targeted rescue reliably resolve CHS in current evidence. The REIC framework fuses mechanism, prediction, and therapy—and all code and data are openly shared.

Ethics Statement

All cited human studies received IRB approval and informed consent. No new human data were collected for this manuscript.

Conflict of Interest

The author declares no competing interests.

Data and Code Availability

Repository: github.com/mikecreation/REIC-CHS
Live PDF and demo: mikecreation.github.io/REIC-CHS

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