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Therapeutic Cannabis Vaporisation Devices:

A Practical Guide for Medical Professionals - Short Guide

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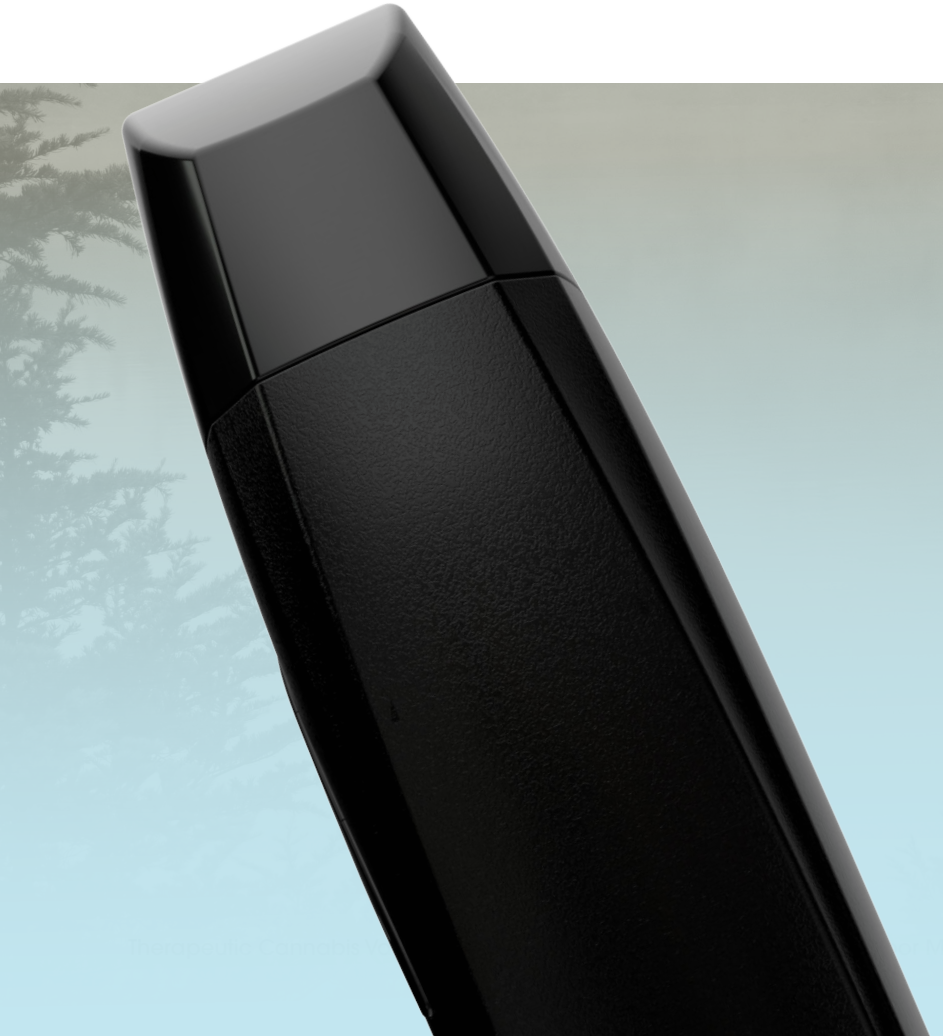

ELITE II

by grenco medical

Disclaimer This short guide is for qualified Australian healthcare professionals only. It is educational and does not constitute medical advice. Always exercise your own clinical judgement and comply with current TGA and state/territory requirements.

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EXECUTIVE SUMMARY

The TGA explicitly states that medicinal cannabis should be vaporised, not smoked.

Optimal Vaporisation heats dried flower to temperatures between 180–210 °C, releasing active cannabinoids (THC, CBD) and terpenes as inhalable vapour without combustion by-products such as tar, carbon monoxide, or polycyclic aromatic hydrocarbons (PAHs).

Key Clinical Advantages of Vaporisation Over Smoking or Oral Routes

- Rapid pulmonary absorption (effects within 90 seconds, peak plasma levels in 3–10 minutes)[1]
- Bioavailability 10–35 % (significantly higher than oral ~6 %) [2]
- Patient-titrated dosing with real-time feedback
- Reduced respiratory irritation and fewer harmful compounds (supported by Gieringer et al. 2004 and multiple TGA-aligned studies) [3]
- Improved adherence due to discretion, minimal odour, and portability

The Grenco Medical ELITE II (ARTG-registered Class IIb device, Health Canada approved 2025, MedSafe NZ registered 2025) is one of the most rigorously tested portable therapeutic cannabis vaporisers available.

It combines dual convection/conduction heating, ±1 °C temperature accuracy, inhaled vapour temperatures safely below 50 °C, and component lifetime exceeding 3–5 years of heavy daily use, **all verified to full international medical-device standards.**

[1] Sharma P, Murthy P, Bharath MM. Chemistry, metabolism, and toxicology of cannabis: clinical implications. Iran J Psychiatry. 2012 Fall;7(4): 149-56. PMID: 23408483; PMCID: PMC3570572.

[2] Chayasirisobhon S. Mechanisms of Action and Pharmacokinetics of Cannabis. Perm J. 2020 Dec;25:1-3. doi: 10.7812/TPP/19.200. PMID: 33635755; PMCID: PMC8803256.

[3] Earleywine M, Barnwell SS. Decreased respiratory symptoms in cannabis users who vaporize. Harm Reduct J. 2007 Apr 16;4:11. doi: 10.1186/1477-7517-4-11. PMID: 17437626; PMCID: PMC1853086.

Why Vaporise?
(Smoking vs Vaporisation)

Smoking involves combustion at 700–900 °C, destroying a large proportion of cannabinoids and generating numerous toxic by-products (carcinogens, carbon monoxide, irritants).[4]

Vaporisation operates at precisely controlled temperatures (typically 180–230 °C), above the vaporisation point of key cannabinoids and terpenes but below the combustion threshold of plant material.

Evidence-Based Advantages

- Substantially fewer pyrolytic compounds in vapour vs smoke [5]
- Higher efficiency in cannabinoid delivery (less loss to side-stream smoke or overheating) [6]
- Precise temperature selection allows customisation for specific cannabinoid/ terpene profiles
- TGA guidance strongly recommends vaporisation over smoking for all medicinal cannabis use, citing reduced respiratory risk and better dose control

This makes vaporisation the preferred method for patients requiring fast titratable symptom relief while minimising long-term harm.

[4] Baker RR, Dixon M. The retention of tobacco smoke constituents in the human respiratory tract. Inhal Toxicol. 2006 Apr;18(4):255-94. doi: 10.1080/08958370500444163. PMID: 22397322.

[5] Gieringer, D., St. Laurent, J., & Goodrich, S. (2004). Cannabis Vaporizer Combines Efficient Delivery of THC with Effective Suppression of Pyrolytic Compounds. Journal of Cannabis Therapeutics, 4(1), 7–27. https://doi.org/10.1300/J175v04n01_02

[6] Spindle TR, Cone EJ, Schlienz NJ, Mitchell JM, Bigelow GE, Flegel R, Hayes E, Vandrey R. Acute Pharmacokinetic Profile of Smoked and Vaporized Cannabis in Human Blood and Oral Fluid. J Anal Toxicol. 2019 May 1;43(4):233-258. doi: 10.1093/jat/bky104. PMID: 30615181; PMCID: PMC6676961.

Pharmacokinetics, Onset & Practical Dosing

Vaporised cannabinoids are absorbed directly through the alveoli, bypassing hepatic first-pass metabolism.

- **Onset:** Cannabinoids detectable in plasma within seconds of the first inhalation; peak plasma concentrations typically achieved in 3–10 minutes.[7]
- **Duration:** Blood THC levels return to baseline within 3–4 hours (physiological effects like heart rate), while cognitive and subjective effects may persist up to 6 hours.
- **Bioavailability:** 10–35 % inhaled vs ~6 % oral, with vaporised cannabis showing significantly higher mean concentrations of THC, 11-OH-THC, and THCCOOH compared to equivalent smoked doses (Spindle et al. 2019).
- **Superior pharmacokinetics:** Rapid absorption and distribution across the blood-brain barrier enable immediate symptom relief, ideal for fluctuating conditions such as breakthrough pain or acute nausea.

TGA / ANZCCP guidance

"Start low, go slow".

Typical starting dose for cannabis-naïve patients: 1.25–2.5 mg THC per session (or 0.1–0.5 of a regular user's dose). Titrate upward by 1.25–2.5 mg every 2–3 days based on response and tolerability. Vaporised delivery makes this titration fast, accurate, and patient controlled.

[7] Sharma P, Murthy P, Bharath MM. Chemistry, metabolism, and toxicology of cannabis: clinical implications. Iran J Psychiatry. 2012 Fall;7(4):149-56. PMID: 23408483; PMCID: PMC3570572.

Temperature Control & Terpenes

Temperature is the single most important variable for therapeutic outcomes. Optimal cannabinoid release occurs between **180–210 °C.**[7]

160°C – 180°C

Primarily terpenes (myrcene, limonene, pinene, linalool) for flavour and entourage effect, with partial decarboxylation of acidic precursors.

180°C – 200°C

Balanced activation of THC and CBD for moderate psychoactive and therapeutic effects.

200°C – 230°C

Maximum cannabinoid extraction and strongest physical effects (terpenes may begin to degrade).

The Grenco Medical ELITE II maintains ±1 °C accuracy across its full programmable range (93–221 °C) with an internal safety shut-off at 53 °C.

This ensures mouthpiece contact temperature remains 40.1–41.3 °C and inhaled vapour never exceeds 49.2 °C, well below the 65 °C safety threshold for mucosal tissues.

[8] Eyal AM, Berneman Zeitouni D, Tal D, Schlesinger D, Davidson EM, Raz N. Vapor Pressure, Vaping, and Corrections to Misconceptions Related to Medical Cannabis' Active Pharmaceutical Ingredients' Physical Properties and Compositions. Cannabis Cannabinoid Res. 2023 Jun;8(3):414-425. doi: 10.1089/can.2021.0173. Epub 2022 Apr 18. PMID: 35442765; PMCID: PMC10249740.

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FEATURES

- Dual convection/conduction heating with patented clean air intake and full ceramic chamber for consistent, pure vapour.
- Zirconia mouthpiece with integrated spiral air-path for active cooling and comfortable lip contact.
- Precise temperature control (93–221 °C) displayed on a full-colour high-resolution TFT screen with haptic feedback.
- 2100 mAh rechargeable lithium-ion battery (1.5-hour USB-C charge, ~60 minutes continuous use).
- Easy-open magnetic lid, built-in carb for airflow control, and compact ergonomic design with protective silicone sleeve and hemp travel case.

These features make the device intuitive for patients with reduced dexterity or mobility issues and suitable for home, clinic, or on-the-go use.

THC Delivery Kinetics (210 °C Study)

A dedicated independent bench-top study was conducted by the manufacturer of the Grenco Medical ELITE II in collaboration with an SCC-accredited analytical laboratory.

Purpose

To objectively validate the device's efficiency in decarboxylating and delivering THC from real cannabis flower at the clinically relevant temperature of 210 °C. The study used a custom vaping machine that precisely replicated realistic patient inhalation patterns (500 mL puff volume, 5-second duration, 2 puffs per minute) and was adapted from the validated Carrara et al. (2020) protocol.[9] This provided reproducible data on extraction efficiency, aerosol yield, and time-to-therapeutic-dose, directly applicable to prescribing and patient counselling.

Study Design

200 mg ground cannabis flower (lab-confirmed total THC 231 mg/g) was loaded; vapour was captured on Whatman filters and residual flower analysed by HPLC-PDA. Endpoints were measured at 1, 5, 10, 15, and 20 inhalations.

Key Results

- THC remaining in flower residue: reduced by >95 % (to 1.64 %) by 15 inhalations (7.5 minutes).
- Cumulative THC delivered in vapour:
  - 0.77 mg after 1 inhalation
  - 4.26 mg after 5 inhalations (2.5 minutes), exceeds minimum therapeutic threshold of 2.5 mg
  - 6.06 mg after 10 inhalations (5 minutes), exceeds 5 mg threshold
  - 8.44 mg after 20 inhalations (10 minutes)

The delivery profile is uniform and predictable across the 20-inhalation session, supporting reliable session-length advice for consistent symptom control. Actual inhaled amounts in real-world use are expected to be higher due to the device's cooling spiral and the conservative test setup (filters placed ~40 mm from mouthpiece).

[9] Carrara L, Giroud C, Concha-Lozano N. Development of a Vaping Machine for the Sampling of THC and CBD Aerosols Generated by Two Portable Dry Herb Cannabis Vaporisers. Med Cannabis Cannabinoids. 2020 Jan 14;3(1):84-93. doi: 10.1159/000505027. PMID: 34676343; PMCID: PMC8489338.

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Performance & Safety Testing

The Grenco Medical ELITE II has undergone an exceptionally high level of independent third-party verification and validation to meet full TGA approved medical-device standards.

Temperature Accuracy & Consistency

- Five production units tested at 180 °C, 200 °C, and 220 °C (10 repeats per setting after full cool-down). Result: ±1 °C accuracy at all three clinically relevant temperatures.

Component Lifetime & Durability

- Ceramic furnace: 5 units cycled at 230 °C (300 s on / 300 s off). Acceptance: ≥2,190 cycles (~3 years heavy daily use). Result: All exceeded 2,500 cycles.
- Heating wire: 5 units tested at 90 % power (3.7 V), heating every 5 seconds for 45 cumulative hours. Acceptance: ≥32,400 cycles. Result: All exceeded 50,000 cycles.

This means the Grenco Medical ELITE II is built to last and can support light, medium and heavy use cannabis patients.

Vapour & Mouthpiece Temperature Safety

- 12 full sessions per device confirmed mouthpiece contact temperature of 40.1–41.3 °C and maximum inhaled vapour of 49.2 °C. Internal sensor auto-shuts at 53 °C and only restarts below 40 °C, providing a substantial safety margin below the 65 °C mucosal injury threshold.

International Standards Compliance

- IEC/EN 60601-1 (basic safety & essential performance)
- IEC/EN 60601-1-11 (home healthcare environment)
- IEC 62304 (software life cycle) & IEC 62366 (usability)
- ISO 10993 series (biocompatibility: cytotoxicity, sensitisation, irritation, chemical characterisation)
- ISO 18562 series (breathing gas pathways: particulate matter, volatile organics, leachable)
- UN 38.3 Lithium Ion Battery safety

All tests passed with no failures. This comprehensive testing profile far exceeds typical requirements for non-ARTG vaporisers and directly underpins the devices mark of quality.

CONCLUSION

Vaporisation is the TGA-preferred route for medicinal cannabis. The Grenco Medical ELITE II vaporiser delivers rapid onset, precise dosing, proven long-term durability, and exceptional safety margins, all verified through independent international standards.

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