

KPODS: ETOMIDATE IN A POD



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Since July 2025, doctors across Singapore have been put on high alert with regard to the unfolding etomidate crisis. Etomidate, an imidazole-derived hypnotic agent, has conventionally been used for anaesthetic purposes.¹ However, in recent years, etomidate has been added as an adulterant in electronic cigarettes (e-cigarettes), and this has been reported in various countries, including Hong Kong,² China,³ and Singapore.^{4,5} Etomidate works as a positive allosteric modulator of the gamma-aminobutyric acid type-A receptor, resulting in an enhancement of inhibitory neurotransmission in the central nervous system.⁶ Locally, e-cigarettes that contain etomidate are known as Kpods. It is concerning that etomidate has been added to e-cigarettes, which hitherto were mostly associated in Singapore with nicotine use. This signifies first and foremost that one can no longer assume that any e-cigarette found locally contains just nicotine, and secondly, that e-cigarettes are conduits for the use of not just illicit drugs but also for other pharmaceutical products.

Acute symptoms following intoxication

When an individual smokes an e-cigarette laced with etomidate, they may experience symptoms including confusion, drowsiness, and incoordination. Such effects may also happen quickly given its rapid onset of action. Some of the more prominent neurological effects include that of weakness, dizziness and falls, and involuntary movements including that of tremors.⁷ If users inhale large amounts, this could predispose them to seizures, impaired consciousness and even a comatose state. Users of Kpods have been implicated in fatal road traffic accidents in Singapore, which are manifestations of etomidate's impact on the central nervous system as described above. Based on published case reports, it has been reported that individuals who abuse etomidate-laced vapes may experience a variety of psychiatric symptoms, such as suicidal behaviours, aggression and agitation.⁸

From our clinical experience, users have experienced a variety of acute effects after inhaling etomidate e-cigarettes, from

short-term memory impairment, slurring of speech and drowsiness to more serious consequences of experiencing seizures during withdrawal.

Psychological dependence and impact on daily functioning

The literature on chronic use of etomidate is limited, given that this is mainly an anaesthetic agent used acutely. From our clinical experience with regard to patients who have used etomidate chronically (ie, from months to years), many individuals report experiencing psychological dependence on etomidate-laced vapes, often describing strong urges and cravings to reuse these products to relive the sense of euphoria they provide. This makes it very difficult for them to stop its use. Some users are aware of the potential harms associated with their usage and recognise the impact on their overall functioning. They note that various aspects of their daily lives have been negatively affected by continued use, including their relationships with family members and their ability to focus at work. The longer the use has been, the greater the psychological dependence and the harder it was for them to break the cycle.

Medical complications

Qin et al⁹ and Chung et al,² in their case reports, have alerted academics and healthcare professionals to the potentially serious medical impact of the use of etomidate-laced vapes. The use of these vapes could result in adrenal insufficiency by inhibiting adrenal 11beta-hydroxylase. This is an enzyme which is instrumental in cortisol production, and the resultant adrenal dysfunction might result in blood pressure issues, adrenal hyperplasia and hypokalaemia. As the medical complications are generally managed in a general hospital setting once detected, this article focuses primarily on the psychiatric aspects of the use of etomidate-laced vapes.

Clinical assessment of individuals presenting with etomidate-laced vape use

Currently, there remain no validated tools or questionnaires for practitioners to

use to assess one's severity of etomidate addiction. The assessment of the clinical severity of one's addiction can potentially take reference to the existing substance use diagnostic criteria in the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR)*. The core aspects of substance use criteria in *DSM-5-TR* include the assessment of whether there is the presence of (a) impaired control, (b) social impairment, (c) risky use, and (d) tolerance and withdrawal.¹⁰ Often, patients may not be willing to share much about their etomidate use, which is not uncommon for an addiction. Hence, collateral information is especially important, and family members often help to provide important information pertaining to the patterns of etomidate use. This then helps the clinician distinguish whether somebody is just abusing Kpods or is dependent on it.

Typical treatment regimen

Individuals who are acutely intoxicated should be medically stabilised first, and laboratory investigations are critical to ascertain whether they have any medical complications following etomidate use, eg, checking electrolytes for potential hypokalaemia. Those who are medically stable can then be referred to social service agencies (SSAs) in the community or the National Addictions Management Service (NAMS) for further assessment. At these agencies, an assessment of the severity of etomidate addiction will be conducted and depending on the severity, they will then be recommended to undergo counselling-based rehabilitation programme at the SSAs or at NAMS.

Counselling interventions typically address one's motivation to change, triggers and cravings leading to one's usage, and assist the individual in making a recovery plan.

Updates about current regulation

Currently, etomidate has been listed as a Class C drug under the Misuse of Drugs Act. Abusers of etomidate will face fines and are required to attend rehabilitation for up to six months for the first offence with subsequent offences incurring

harsher penalties. These policies ensure that those who abuse etomidate get the necessary help and support to manage their condition, including addressing any addiction through appropriate psychoeducation and counselling support. We are hopeful that the current measures will stem the tide in this new wave of addictions while remaining mindful that etomidate will not be the last medication to be added to an e-cigarette. ♦

References

1. Forman SA. Clinical and molecular pharmacology of etomidate. *Anesthesiology* 2011; 114(3):695-707.
2. Chung YK, Cheung YT, Chan CSY, et al. Adrenal insufficiency due to etomidate inhalation via electronic cigarettes: three local cases. *Hong Kong Med J* 2025; 31(3):229-32.
3. Wu W, Xia C, Gan L, Liao S, Yan Y. Etomidate-induced hypokalemia in electronic cigarette users: two case reports and literature review. *Front Endocrinol (Lausanne)* 2024; 15:1321610.
4. Health Sciences Authority. HSA Investigates Public Vaping Incidents; Etomidate-laced E-vaporisers Seized. Available at: <https://bit.ly/3WqTQLR>. Accessed 8 October 2025.
5. Parliamentary QA. Deterrence for use of kpods or vape juices mixed with etomidate. In: Ministry of Health. Available at: <https://bit.ly/3WqZAfo>. Accessed 8 October 2025.
6. Valk BI, Struys MMRF. Etomidate and its Analogs: A Review of Pharmacokinetics and Pharmacodynamics. *Clin Pharmacokinet* 2021; 60(10):1253-69.
7. Zhou B, Yang S, Zhou X, et al. Severe tremors induced by tiletamine e-cigarette and alcohol use: a case report. *Front Psych* 2025; 16:1537822.
8. Liang STH, Lam RPK, Chan NTJ, et al. Subclinical adrenal suppression and urine immunoassay detection of etomidate in an electronic cigarette user. *Clin Toxicol (Phila)* 2025; 63(5):364-6.
9. Qin Y, Lin H, Lv W, Hong S, Huang Z. Adrenal insufficiency associated with long-term use of electronic cigarettes reportedly containing etomidate in two patients. *Clin Toxicol (Phila)* 2024; 62(10):672-3.
10. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders Fifth Edition, Text Revision*. Washington DC: American Psychiatric Association, 2022.