

Occupational Exposure to **Ketamine**: A Scoping Review

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This review found that healthcare professionals, including paramedics, are at risk of occupational exposure to ketamine, which can be detected during routine workplace drug testing. Exposure primarily occurs through dermal absorption and inhalation during drug preparation and handling. Hair analysis emerged as the primary method occupational exposure to ketamine was detected. The lack of universally accepted cut-off values for hair analysis complicates distinguishing between occupational exposure and intentional use, potentially leading to serious professional consequences.

Introduction

- Ketamine is widely used in emergency and prehospital settings^{1,2}
- Occupational exposure (OE) to ketamine is an understudied area of concern³
- Advanced drug testing can detect ketamine at very low levels⁴
- The lack of internationally recognised cut-off values complicates the interpretation of positive results⁵

Methods

- Databases searched: MEDLINE, CINAHL, Scopus, Emcare, and Embase
- Grey literature sources included
- Quality assessments were completed using tools from the Joanna Briggs Institute and the National Heart, Lung, and Blood Institute^{22,21}
- 6,604 records screened
- 15 papers met the inclusion criteria

Author	Year	Country	Method
Cope, RB. ⁷	2018	Australia	Case study
Doran, GS. et al. ¹⁴	2017	Australia	Cross-sectional field study
Doran, GS. et al. ¹⁵	2017	Australia	Method & Validation study
Doran, GS. & Howitt, JA. ⁹	2019	Australia	Experimental lab study
Favretto, D. et al. ⁶	2016	Italy	Retro & prospective study
Fitzsimons, MG. et al. ¹⁶	2013	USA	Case report
Salomone, A. et al. ⁵	2015	Italy	Literature review
Salomone, A., et al. ¹⁷	2016	Italy	Best practices review
Drummer, OH., et al. ⁴	2020	Australia	Letter to the editor.
Ambulance Active AEA.V. ¹⁸	2020	Australia	Press release (Bulletin)
Mylan Institutional LLC. ¹⁹	2014	Australia	Safety Data Sheet
National Centre Bio. ²⁰	2024	USA	Compound summary
Ambulance Active AEA.V. ¹³	2021	Australia	Press release (Bulletin)
Ambulance Active AEA.V. ¹²	2021	Australia	Campaign video
Ambulance Active AEA.V. ¹¹	2021	Australia	Working Group Submission

Figure 1: Key statistics from included studies

Results

Concept mapping was used to identify four key themes contributing to occupational exposure risk:

Route of Exposure

- Primary routes identified: Dermal absorption and inhalation^{6,7}
- Highest risk during the preparation and handling of ketamine⁶

Surface Contamination

- Ketamine can persist on common work surfaces for up to 20 days⁸
- Increased risk of transfer to skin through direct or glancing contact⁹

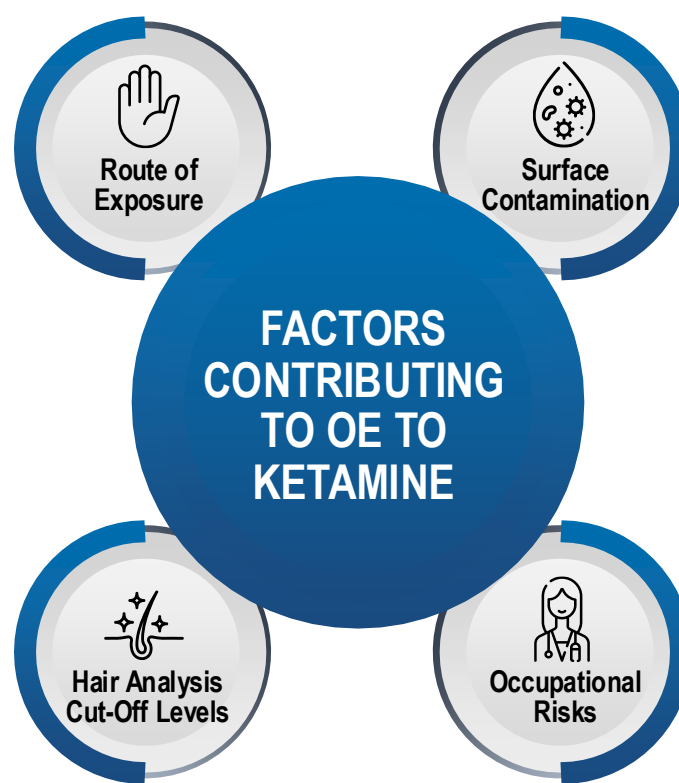


Figure 2: Occupational Exposure Themes

Hair Analysis Cut-off Levels

- Proposed cut-off levels of 0.5 ng/mg of ketamine in hair is recommended to differentiate between chronic and occasional use¹⁰
- Detection of norketamine (>0.1 ng/mg) needed to confirm active intake¹⁰

Occupational Risk

- Positive drug test to ketamine could have severe consequences for paramedics' psychological, professional, and personal lives¹¹⁻¹³
- Risk of false accusations and disciplinary action^{4,16}

Conclusions

- No specific research on paramedics' OE risk to ketamine
- Evidence suggests all healthcare professionals handling ketamine face significant OE risk⁶⁻⁸
- Proper use of PPE and drug handling practices are crucial
- Challenges in interpreting hair analysis results due to the lack of universally accepted cut-off values^{5,10}

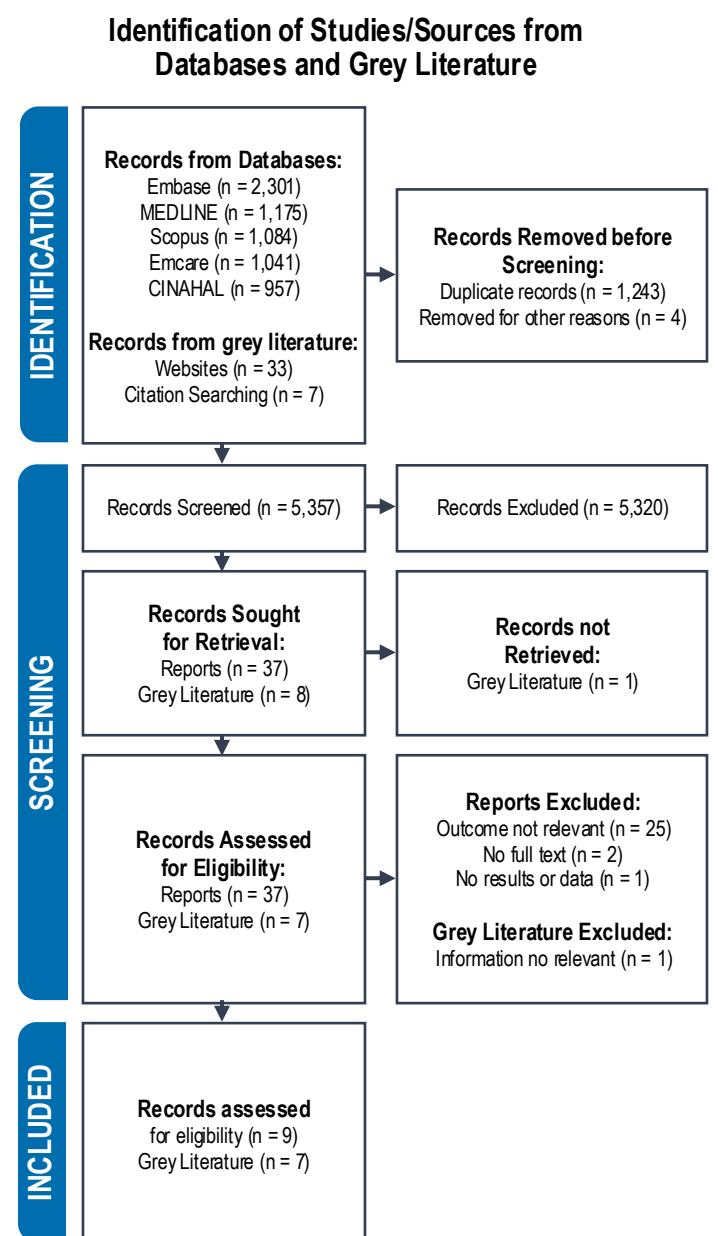


Figure 3: PRISMA flow chart



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