

# Paramedic – Evidence Based Medicine (P-EBP) Program

## Paramedic CAT (Critically Appraised Topic) Worksheet

**Title:** *How is mortality affected in patients who are sedated prior to intubation when they have a significantly decreased GCS?*

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**Clinical Scenario:** *“You have a patient who has a decreased GCS of 3-6 who requires intubation. They are potentially hemodynamically unstable, and have a minimal gag response. Will it benefit the patient to sedate them prior to intubation to ensure they are dissociated enough to be unaware of the intubation? Or will it be harmful to the patient by lowering their blood pressure even more.”*

**PICO (Population – Intervention – Comparison – Outcome) Question:**

*Is there increased mortality or hemodynamic compromise in patients with severely decreased GCS who require intubation?*

**Search Strategy:**

*Intubation AND Sedation AND GCS*

*Sedation AND Intubation AND Mortality*

**Search Outcome:**

*39*

*328*



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## Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Hoffman et. al, 2016	21 242 adults with a GCS less than 8 who were intubated prehospital	Retrospective Cohort Analysis  Evidence Level II	Mortality and Neurological outcome	<p>Difference between observed and expected mortality based on the RISC-II prognosis was lower in intubated patients (42.2% [95% CI, 41.5-42.9%])</p> <p>Patients sedated before intubation had lower observed mortality (37.7% [95% CI, 36.7-38.7%; RISC-II prognosis 39.0%; SMR 0.967 [95% CI, 0.951-0.983])</p> <p>Patients sedated before intubation also had a better early neurological outcome compared to those not intubated (64.8% [95% CI, 62.6-67.1%]; RISC-II prognosis 61.1%; SMR 1.061 [95% CI, 1.025-1.098])</p>	<p>This study brings up interesting points about the potential benefits to the patient of always providing a bit of sedation before intubating. This statistic does not take into account, however, the fact that patients with a higher GCS are more likely to have a positive outcome regardless of sedation or intubation.</p> <p>This study also is using a predictive value as its comparison rather than actual patients. While many factors were taken into account to make the RISC-II prognosis, it is still not as beneficial of actual patient comparisons in a</p>



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					randomized control trial.
Cornelius et. al, 2018	148 patients with increased hypertension that were intubated prior to arrival at trauma center; 52 were excluded	Retrospective chart review  Evidence level II	Morbidity, Mortality, and length of stay based on sedative agent	<p>Patients receiving ketamine had lower mortality rates than those receiving etomidate or midazolam %=38.3 (E) 13.3 (K) 40.7 (M)</p> <p>Patients receiving ketamine, however, had a longer length of stay in hospital %=36.2 (E) 60 (K) 33.3 (M)</p> <p>Although the study was not specifically looking at this, the change in systolic blood pressure from pre-hospital to ED had the lowest drop in the ketamine group: E= 125.6 to 114.3; K= 118.6 to 117.6; M=142.7 to 122.1</p>	<p>One of the flaws from this trial was how small the sample size was. It began with only 148 patients, and had to have 52 excluded leaving 96 patients enrolled.</p> <p>This study also states that it was a retrospective study that included patients from different air ambulance services, so there is not a necessarily the same standard of care between the different services.</p> <p>This was a well-done study, albeit with a small sample size. It does not look specifically at sedating vs. not sedating, but does provide interesting information regarding how certain sedation</p>



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					agents affect hemodynamic stability
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## Comments:

These studies do not pertain directly to the PICO question asked; however, their data can be used to potentially form more research studies in the future. One main reason why people are hesitant to sedate a patient who already has a decreased GCS is because they are worried about worsening the hemodynamics in an already unstable patient. The first study shows that patients who receive sedation prior to intubation may have a better outcome over those that have not been sedated. The second study shows that ketamine can have a very limited affect on hemodynamics, unlike other agents such as midazolam.

By sedating these patients, we could reduce the risk that their sympathetic system may be more stimulated when they are still slightly aware of the procedures being done to them, even when their GCS makes it seem unlikely.

Further studies in this area could be very pertinent for services like British Columbia where RSI is not in the scope of ACP's.

## Consider:

These studies make me more inclined to use ketamine in my practice for patients in which I am worried about their hemodynamics prior and post sedation. I believe more studies need to be done, however, before any definitive remarks can be made about this topic.

## Clinical Bottom Line:

It could be reasonable to sedate using an agent such as ketamine when intubating a patient with a very decreased GCS. It may dissociate them enough so their sympathetic drive will not be stimulated further if they have some awareness of what is going on, however, will not negatively affect their hemodynamics as much as other agents.



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## References:

Hoffmann, M., Czorlich, P., Lehmann, W., Spiro, A. S., Rueger, J. M., Lefering, R., & TraumaRegister DGU of the German Trauma Society (DGU) (2017). The Impact of Prehospital Intubation With and Without Sedation on Outcome in Trauma Patients With a GCS of 8 or Less. *Journal of neurosurgical anesthesiology*, 29(2), 161–167.

<https://doi.org/10.1097/ANA.0000000000000275>

Cornelius, B. G., Webb, E., Cornelius, A., Smith, K., Ristic, S., Jain, J., Cvek, U., & Trutschl, M. (2018). Effect of sedative agent selection on morbidity, mortality and length of stay in patients with increase in intracranial pressure. *World journal of emergency medicine*, 9(4), 256–261. <https://doi.org/10.5847/wjem.j.1920-8642.2018.04.003>

