Critical Review Form
Economic Evaluation

Short-Acting Agents for Procedural Sedation and Analgesia in Canadian Emergency Departments: A Review of Clinical Outcomes and Economic Evaluation, *Canadian Agency for Drugs and Technologies in Health* 2008

Objective: **"To conduct a systematic review and primary economic analysis to evaluate the clinical efficacy, safety and cost-effectiveness of short-acting and dissociative agents (i.e., propofol, ketamine, ketofol, etomidate) for procedural sedation for adults who present to ED's for painful procedures". (p. 5)**

Methods: **After identifying 41 relevant studies via an electronic search and grey literature review, a cost-minimization analysis and multi-way sensitivity analysis were employed to evaluate the cost-effectiveness of short-acting procedural sedation drugs compared with one another, and with conventional opioid and benzodiazepine agents for adult ED PSA (p. v).**

Guide		Comments
I.	**Are the Recommendations Valid?**	
A.	**Did the investigators adopt a sufficiently broad viewpoint?**	Yes, the authors considered various agents, Canadian health care settings, and outcomes.
B.	**Are the results reported separately for patients whose baseline risk differs?**	No individual patient data is presented in this SR.
C.	**Were costs measured accurately?**	The authors used objective, publicly available cost figures whenever available.
D.	**Did investigators consider the timing of costs and outcomes?**	"Health service events after discharge from the ED included hospitalization, physician visits, subsequent admissions to emergency and outpatient medications for a maximum 8-week time horizon. Health service events beyond eight weeks could not be attributed to initial procedural sedative agents" (p. 35)

II.	What Are the Results?	
A.	**What are the incremental costs and effects of each strategy?**	Focusing upon propofol and ketamine as stand-alone PSA agents: • Expense propofol 200mg @ $3.20, ketamine 40mg @ $4.50. • Alberta data 8.3 hour average ED length of stay (LOS) for PSA patient and the procedure only takes 15.5 minutes or about 3.1% of the total ED LOS). (pp 39 – 40) • Cost-minimization analysis attributing costs attributable only to variations in the sedation strategy (lacking any high quality evidence for ketamine efficacy so using that for propofol): <u>total cost per sedation ketamine $230.65, propoofol $138.76, ketofol $230.99.</u> • <u>Cost savings ketamine $244 propofol $336 ketofol $243.</u> • Propofol still dominates with sensitivity analysis for mediation expense, labor costs, and hospitalization varying assumptions for staffing and the implications of a failed procedure. • Ketamine, ketofol, etomidate, and propofol are all superior to traditional opioid/benzodiazepine agents for cost-minimization. • <u>Using propofol for PSA is projected to save Canada between $33.8 – 59.7 million (Canadian $ 1997) annually</u> – approximately $336/case.
B.	**Do incremental costs and effects differ between subgroups?**	No differences when various assumptions made, though specific patient subgroups were <u>not</u> analyzed.

C.	**How much does allowance for uncertainty change the results?**	The results were robust to sensitivity analysis.
III.	**How Can I Apply the Results to Patient Care?**	
A.	**Are the treatment benefits worth the harms and costs?**	Yes – cost savings with no increased harm.
B.	**Could my patients expect similar health outcomes?**	Yes.
C.	**Can I expect similar costs at my setting?**	Yes, probably greater cost savings given US drug prices, ED over-crowding, and inpatient hospitalization expenses.

III.	**How Can I Apply the Criteria to Patient Care?**	
A.	**Are the criteria relevant to your practice setting?** *Medical practice is shaped by an amalgam of evidence, values, and circumstances; clinicians should consider their local medical culture and practice circumstances before importing a particular set of audit criteria.*	Yes, the assumptions and inclusion criteria, the authors used apply to my practice.
B.	**Have the criteria been field-tested for feasibility of use in diverse settings, include settings similar to yours?**	No.

Limitations:

1) **Small body of moderate quality literature upon which to base economic assumptions.**

2) **Canadian costs, staffing models, and sensitivity analysis assumptions may not apply to US healthcare system.**

Bottom Line:

At a savings of $336/case, propofol dominates the cost-minimization analysis of ED PSA with short-acting agents. Ketamine and ketofol suffer from insufficient cost-effectiveness data upon which to base assumptions, but still yield robust savings of $244/case.