

# The State of Sedation in the Nation: Results of an Australian Survey

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## ABSTRACT

**Objective:** *The authors conducted a postal survey to establish what the current sedative and analgesic practice in selected Australian intensive care units was.*

**Methods:** *A questionnaire based on a European email survey was devised and then posted to directors and senior Intensivists in 72 Australian intensive care units.*

**Results:** *There were 47 returns out of 72 units. The most commonly used drugs were infusions of morphine and midazolam. A sedation scale was used in 21 of the units that replied to the survey. Only 7 units surveyed regularly audited complications related to sedation. The most common method of sedative/analgesic drug administration was by continuous infusion.*

**Conclusions:** *Despite recent recommendations for daily interruption of sedative agents and the use of a sedation scale, this was not the most common practice in Australian intensive care units. Most units used continuous infusions of midazolam and morphine for sedation/analgesia. (Critical Care and Resuscitation 2005; 7: 92-96)*

**Key words:** Sedation, analgesia, Australian ICU's

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Historically, most patients in the intensive care unit have been sedated with a combination of benzodiazepines and narcotics.<sup>1</sup> This practice has not been without problems, as narcotics and their metabolites may have delayed elimination in patients with hepatic and/or renal impairment.<sup>2,3,4</sup> A recent publication suggests there may be advantages in regular de-sedation of patients in the Intensive Care Unit (ICU) as a tool to assess analgesic and sedative requirements.<sup>5</sup> There is now a wide variety of pharmacological agents available for sedation and analgesia. The choice of agent used in individual ICUs depends on many factors, including the individual requirement for sedation and analgesia, the pharmacodynamics and pharmacokinetics of a drug, the route and ease of administration and the tolerance profile and cost of the drugs used.

We sought to establish the current sedative and analgesic practice in selected Australian ICUs.

## MATERIALS and METHODS

A questionnaire based on a European e-mail survey was devised (see appendix).<sup>6</sup> Modifications were

made to more accurately reflect current Australian practice. The questionnaire was then posted to directors and senior intensivists in 72 selected Australian ICUs. Primarily public ICUs were targeted and only private intensive care units with ventilation capacity were surveyed. Units were selected through personal contact. Information was obtained as to the nature of the ICU and the level of experience of nursing staff administering the drugs. Questions also related to the use of sedation scales, the audit of complications and the nature and type of drug administration.

## RESULTS

There were 47 returns from the 72 units that received a postal questionnaire (65% response rate). Of the 47 units that replied to the survey, the majority (46) were mixed units admitting both medical and surgical patients. One unit admitted only medical patients and there was no unit that treated only surgical patients. Most units administered drugs as a continuous infusion (34 units). Seven units used a continuous infusion of medication, with daily de-sedation, as their

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standard practice. Five units used a combination of approaches in their practice of sedative and analgesic administration.

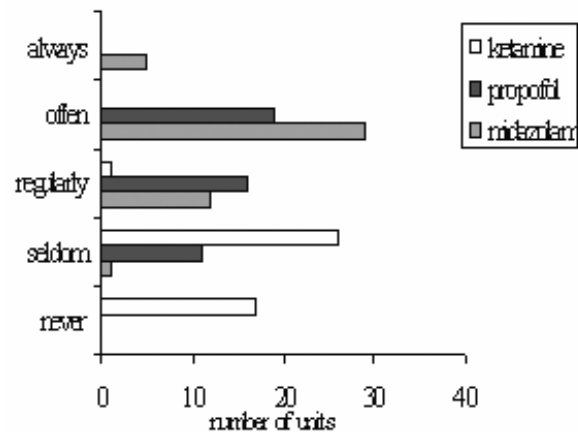
Twenty one of the 47 units surveyed used a sedation scale routinely. The majority of units (14) never used written protocols for sedation and 19 units seldom used protocols when sedation and analgesia were administered. Only 7 units confirmed that a regular audit of complications related to sedation and analgesia was performed. The complications that were noted as a consequence of sedation were delayed weaning in 2 units, oversedation in 4 units and prolonged ICU length of stay in 1 unit.

The level of nursing experience responsible for titrating and administering sedation varied. Nurses with less than one year's experience accepted responsibility for drug administration and titration as follows; never in 3 units, seldom in 23 units, regularly in 12 units, often in 6 units and always in 3 units (table 1).

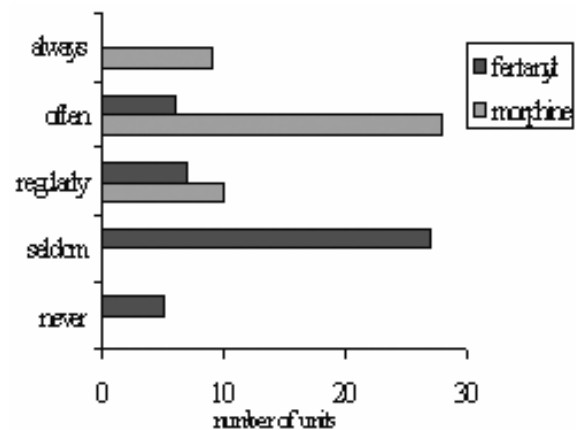
**Table 1. Response to survey**

<i>Response rate</i>	47 returns out of 72
<i>Type of unit</i>	Mixed: 46 units Medical: 1 unit Surgical: 0 unit
<i>Method of drug administration</i>	- Continuous infusion: 34 units - Continuous infusion with daily interruption: 7 units - Combination of methods: 5 units
<i>Sedation scale use</i>	Yes: 21 units No: 26 units
<i>Written sedation protocols in use</i>	Never in use: 14 units Seldom in use: 19 units
<i>Audit of complications</i>	Regular audit: 7 units
<i>Nature of complications audited</i>	- Delayed weaning: 2 units - Over sedation: 4 units - Prolonged ICU length of stay: 1 unit
<i>Frequency of drug titration and administration by nurses with less than 1 years ICU experience.</i>	Never: 3 units Seldom: 23 units Regularly: 12 units Often: 6 units Always: 3 units

The majority of ICUs favoured midazolam as a sedative agent. Propofol was used with less frequency and ketamine was seldom used (table 2, figure 1). Morphine was the most commonly used analgesic, followed by fentanyl. (table2, figure 2).



**Figure 1.** Sedative agent use



**Figure 2.** Analgesic agent use

## DISCUSSION

Previously published data has revealed inconsistencies in the administration of sedative and analgesic agents in the ICU. A survey in the United Kingdom by Bion and Lendingham,<sup>7</sup> revealed that a combination of benzodiazepines and opiates were most commonly used for sedation. A 1991 survey in the United Kingdom,<sup>8</sup> confirmed decreasing sedative use in ICUs. Despite the trend to less sedation, an email survey in 2001 revealed that there was still no uniformity of practice in European intensive care units, with a significant variation in practice between countries.<sup>6</sup> It was also noted that the use of sedation scales was not consistent amongst participating ICUs.

The Australian experience reflects the changes that

**Table 2. Drugs used for sedation and analgesia**

	<i>Frequency</i>		<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
<b>Midazolam</b>					
Valid	Seldom	1	2.3	2.3	2.3
	Regularly	11	25.0	25.0	27.3
	Often	27	61.4	61.4	88.6
	Always	5	11.4	11.4	100.0
<i>Total</i>		44	100.0	100.0	
<b>Propofol</b>					
Valid	Seldom	11	25.0	25.6	25.6
	Regularly	13	29.5	30.2	55.8
	Often	19	43.2	44.2	100.0
	<i>Total</i>		43	97.7	100.0
Missing	Missing	1	2.3		
<i>Total</i>		44	100.0		
<b>Ketamine</b>					
Valid	Never	16	36.4	39.0	39.0
	Seldom	24	54.5	58.5	97.6
	Regularly	1	2.3	2.4	100.0
	<i>Total</i>		41	93.2	100.0
Missing	Missing	3	6.8		
<i>Total</i>		44	100.0		
<b>Morphine</b>					
Valid	Regularly	9	20.5	20.5	20.5
	Often	26	59.1	59.1	79.5
	Always	9	20.5	20.5	100.0
<i>Total</i>		44	100.0	100.0	
<b>Fentanyl</b>					
Valid	Never	4	9.1	9.5	9.5
	Seldom	26	59.1	61.9	71.4
	Regularly	6	13.6	14.3	85.7
	Often	6	13.6	14.3	100.0
<i>Total</i>		42	95.5	100.0	
Missing	Missing	2	4.5		
<i>Total</i>		44	100.0		

have occurred over the last decade. Rankin surveyed nine Victorian intensive care units in 1992.<sup>9</sup> This survey revealed that most ICUs at that time used a combination of benzodiazepines and opiates and that no unit had a formal assessment tool or sedation policy.

A more recent and comprehensive study by Magarey again reviewed the practice of sedation for artificially ventilated patients in Australian ICUs.<sup>10</sup> This study revealed that the most common form of sedation was a combination of benzodiazepines and narcotics (88%), in particular morphine and midaz-

olam. In 79% of units these drugs were administered by a constant infusion. Neuromuscular drugs were no longer commonly used in conjunction with sedation, with most units (88%) indicating occasional use only of relaxants. In 94% of units nurses were responsible for titrating and administering sedation and their experience varied widely. In the majority of units (63%) the aim was to lightly sedate patients, yet oversedation was still reported as a complication in 32% of units. In light of recent publications<sup>5, 11</sup> suggesting that changes in sedative practice may have clinical

advantages, the investigators wished to establish whether Australian intensivists have changed their practice.

Our results show many similarities with the survey conducted in Australia in 1997.<sup>10</sup> The favoured drugs used for sedation and analgesia remain midazolam and morphine. The current survey also revealed that sedation scales were used in 44% of units compared to only 17% of units in 1997. Sedation scales were used more widely in Australia than in Europe.<sup>6</sup>

Our study has limitations in that the response rate to the questionnaire was only 65%. Also, the units surveyed were not obtained from an available database such as the ANZICS Clinical Trials Group mailing list or the Joint Faculty of Intensive Care Medicine. Units were selected through personal contact and there may have been an element of selection bias.

In conclusion, morphine and midazolam are still the drugs of choice for sedation and analgesia in most Australian ICUs. These drugs were administered as constant infusions in most units and complications were not always audited. Strategies to limit sedation and analgesic use such as daily interruption of infusions were not common practice.

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## APPENDIX: SEDATION QUESTIONNAIRE

NAME: \_\_\_\_\_ HOSPITAL: \_\_\_\_\_

- Type of ICU  
 Medical                       Surgical                       Mixed
- How are sedating drugs usually administered?  
 continuous infusion     intermittent boluses                       continuous infusion with daily interruption
- Do you use a sedation scale?                       yes                       no
- Are nurses with less than 1 year ICU experience responsible for administering and titrating sedation?  
 never                       seldom                       regularly                       often                       always
- Do clinicians administering and titrating sedation use specific written protocols for the administering of sedation in your unit?  
 never                       seldom                       regularly                       often                       always
- Does your unit audit complications such as under or over sedation?                       yes                       no  
 If yes – what is the most frequent complication? \_\_\_\_\_

7. In patients undergoing a continuous infusion of sedative agents, how often do you use the following agents?
- |           |                                |                                 |                                    |                                |                                 |
|-----------|--------------------------------|---------------------------------|------------------------------------|--------------------------------|---------------------------------|
| Midazolam | <input type="checkbox"/> never | <input type="checkbox"/> seldom | <input type="checkbox"/> regularly | <input type="checkbox"/> often | <input type="checkbox"/> always |
| Propofol  | <input type="checkbox"/> never | <input type="checkbox"/> seldom | <input type="checkbox"/> regularly | <input type="checkbox"/> often | <input type="checkbox"/> always |
| Ketamine  | <input type="checkbox"/> never | <input type="checkbox"/> seldom | <input type="checkbox"/> regularly | <input type="checkbox"/> often | <input type="checkbox"/> always |
8. In patients undergoing a continuous infusion of analgesic agents, how often do you use the following agents?
- |          |                                |                                 |                                    |                                |                                 |
|----------|--------------------------------|---------------------------------|------------------------------------|--------------------------------|---------------------------------|
| Morphine | <input type="checkbox"/> never | <input type="checkbox"/> seldom | <input type="checkbox"/> regularly | <input type="checkbox"/> often | <input type="checkbox"/> always |
| Fentanyl | <input type="checkbox"/> never | <input type="checkbox"/> seldom | <input type="checkbox"/> regularly | <input type="checkbox"/> often | <input type="checkbox"/> always |