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Respiratory monitoring practices during nurse-administered procedural sedation and analgesia in the Cardiac Catheterisation Lab could be enhanced by using capnography to monitor ventilation

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Learning objectives

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The learner will be able to **appreciate the complexity of monitoring respiration during procedural sedation and analgesia in the cardiac catheterisation lab**

The learner will be able to **understand the mechanism in which nurses may be able to improve patient outcomes by using capnography to monitor ventilation during procedural sedation and analgesia**

Introduction

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Procedural sedation and analgesia **used to reduce or alleviate pain, discomfort or anxiety**

Procedural sedation and analgesia *more preferable* than general anaesthetic

However, **the *safety* of procedural sedation and analgesia is dependent on the timely identification and swift treatment of *impaired respiratory function***

Impaired respiratory function

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Depressed respiratory drive

Hypopnoeic hypoventilation
(diminished tidal volume respiration)
Bradypnoea (reduced respiratory rate)
Apnoea (absence of respiration)

Partial airway obstruction

Relaxation of pharyngeal musculature

Procedural Sedation and Analgesia in the Cardiac Cath Lab

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Some aspects of procedures are ***painful***. Procedures require ***prolonged immobilisation***. There are multiple sources of ***anxiety*** associated with undergoing a procedure in the Cardiac Cath Lab.

Procedural Sedation and Analgesia in the Cardiac Cath Lab

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Nursing role

Scout nurse administers sedative and analgesic medications according to verbal direction from the cardiologist. Particularly important responsibility is to monitor the patient's ***respiratory function***.

Literature Review

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Serious adverse events **associated with nurse-administered procedural sedation and analgesia in the Cardiac Cath Lab are** ***rare***

Respiratory complications range from ***2.4%-9.4%***

Conway et al. (2011) Int J Nurs Stud 48(8), 1012-1023

No research **undertaken to describe nursing practices related to assessment of respiratory function during nurse-administered procedural sedation and analgesia in the Cardiac Cath Lab**

The Study

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Aim **Describe PSA-related respiratory monitoring practices**

Method **Retrospective medical record audit of procedures performed in the CCL of one private hospital in May and June 2010**

Data collection **Data extraction tool was pilot tested. Minimal changes were required and it was found to be efficient and easy to use. One researcher collected data to ensure it was standardised**

Results

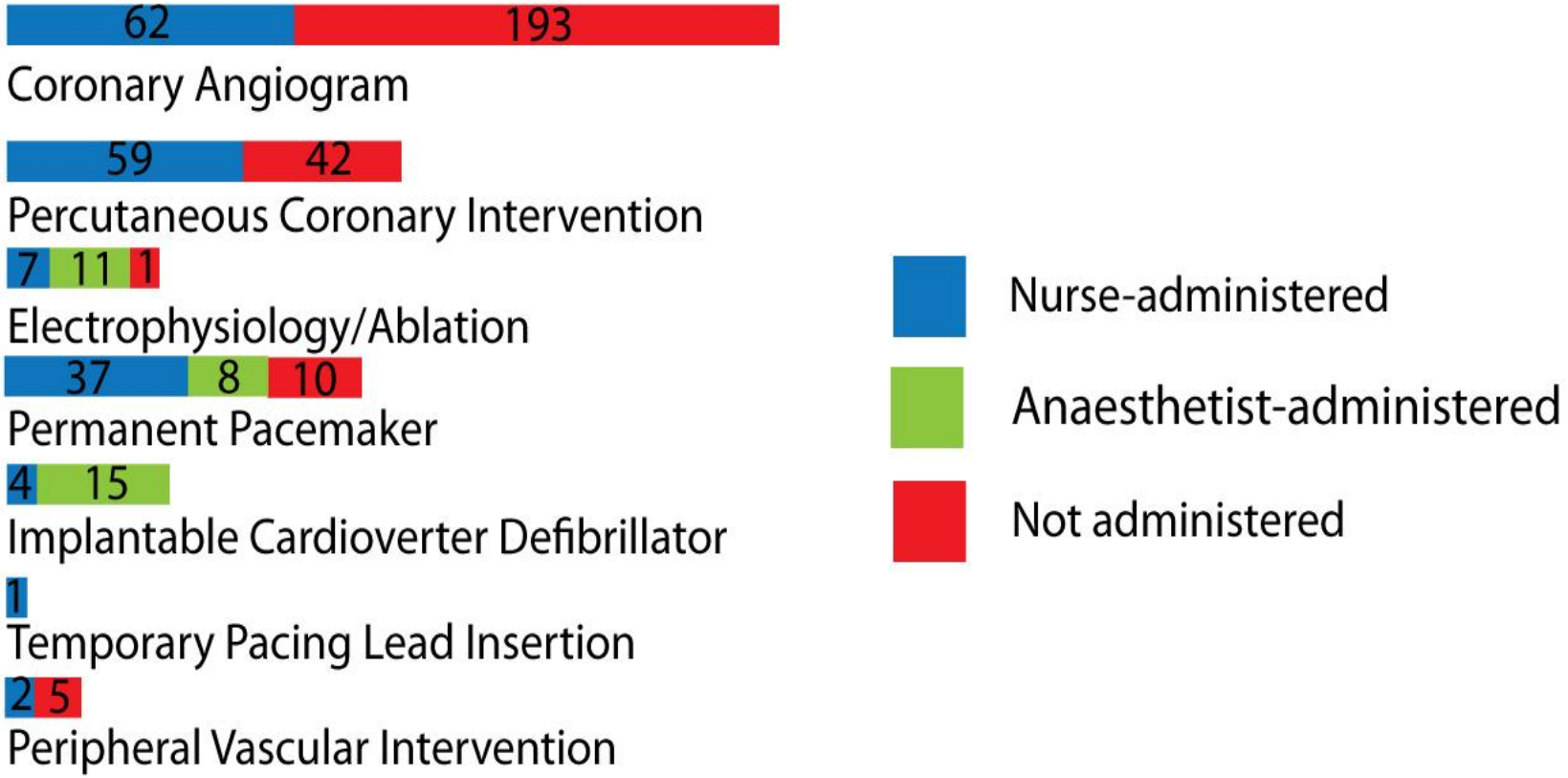

Figure 1: Procedural sedation and analgesia per procedure

Results

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Respiratory monitoring practices

- Oxygen saturations were recorded during 160/169 (94%) procedures
- Respiration rate was recorded during 17/169 (10%) procedures

Interventions to support respiratory function

- It was documented that 35/169 (20%) patients received oxygen supplementation

Patient outcomes

- No serious sedation-related complications
- 14/169 (8.3%; 95% CI=4.14%-12.46%) patients experienced a period of oxygen desaturation

Discussion

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In most cases nurses ***did not record respiration observations***

Discussion

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Without concurrent observation of respiration, oxygen saturation monitoring will not detect respiratory depression because it measures *oxygenation* *not* *ventilation*[1]

Burton et al. (2006). *Acad Emerg Med., 13(5), 500-504.*

Discussion

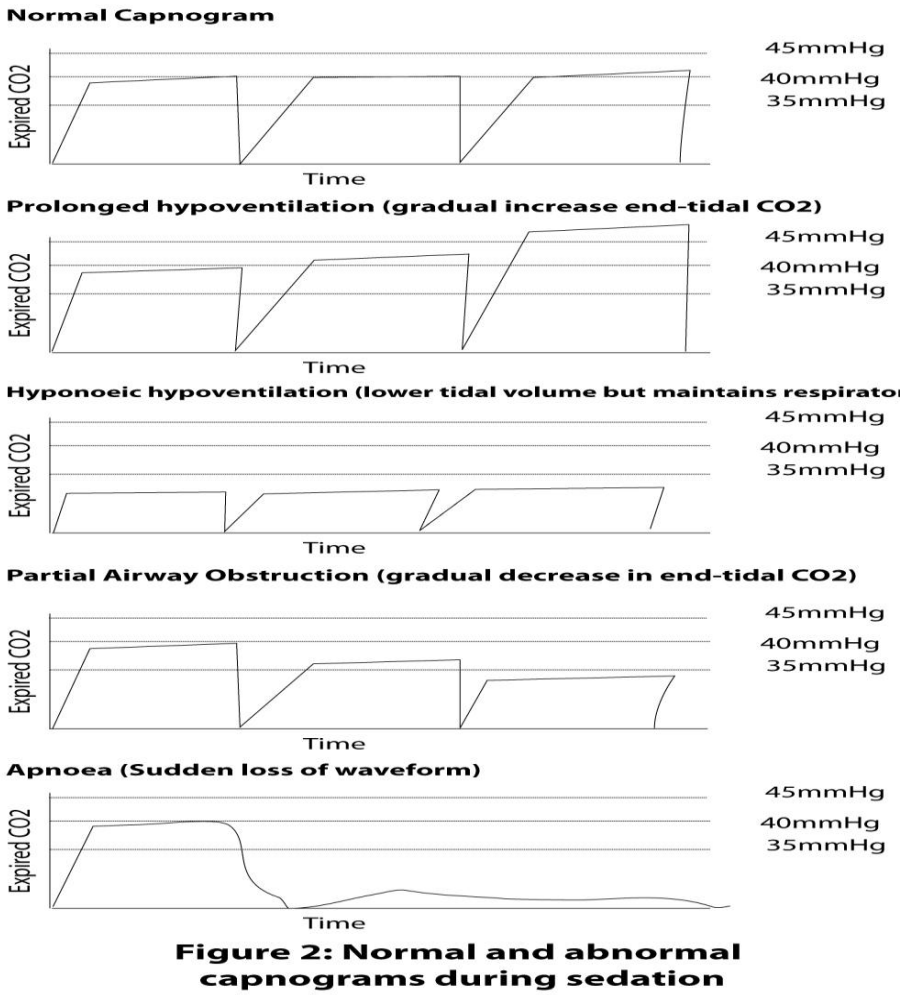

Figure 2: Normal and abnormal capnograms during sedation

Capnography enables identification of respiratory depression in real-time

Frakes, M. A. (2001). Crit Care Nurse, 21(5), 23.

Level 1 evidence for capnography during sedation

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A meta-analysis of studies found that *respiratory depression was 17.6 times more likely to be detected* during procedural sedation and analgesia if capnography monitoring was used

Waugh et al., (2011). J Clin Anesth. 23, 1899-196.

Limitations

Retrospective **Accuracy and consistency of the information in the medical records unable to be checked**

Single centre

Conclusion

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While *no serious adverse events* occurred, an aspect of nursing practice that could be improved was identified

More comprehensive assessment of respiratory function is required

Future research is indicated to determine whether periods of oxygen desaturation could be prevented if capnography is used