

Title: Audit: Peri-operative use of Emergency Anaesthetic Drugs

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Introduction:

Emergency anaesthetic drugs are routinely drawn by anaesthetists at the start of the operating list. The advantage of predrawn drugs is reduction in “decision to delivery” time during anaesthetic emergencies. This is relevant for the single handed anaesthetist, especially for trainees, and those working in unfamiliar environment as well as in paediatric cases where pre-preparation and dilution are necessary.

Use of different systems in different hospitals may result in wrong drug administration, particularly when trainees move from one hospital to another. There is no policy in any hospital regarding drawing up these emergency drugs and there are no set standards for comparison.

Aims & Objectives:

The aims of this audit were:

- To study the practices of peri-operative usage of emergency anaesthetic drugs
- To assess the actual use and wastage of these drugs
- To consider the cost effectiveness of “prefilled” syringes for these drugs

Material & Methods:

A questionnaire was sent to all anaesthetists working at this institution as shown in the table below. The responses were then analysed.

Audit of Perioperative use of Emergency Anaesthetic Drugs (March/April 2007)								
<i>Dr. Smita Oswal and Dr. K. Kyriakides</i>								
Please tick all appropriate boxes and return completed form to Smita's pigeonhole by the end of next week. Thank you.								
1. What grade anaesthetist are you?								
Consultant	<input type="checkbox"/>	SpR	<input type="checkbox"/>	NCCG	<input type="checkbox"/>	SHO	<input type="checkbox"/>	
2. How often do you draw the above emergency drugs at the START of the list?								
Type of usage		Always		Sometimes		Never		
Planned		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
Unplanned		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		
3. Which drugs do you draw?								
Type of case:		Atropine		Suxamethonium		Ephedrine		Phenylephrine
Elective:	Paediatric	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
	Adult (GA)	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
	Adult (Regional)	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Emergency:	Paediatric	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
	Adult	<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
4. When you draw out these drugs before surgery, how often do you actually use them on average per month? (unplanned only)								
		Atropine		Suxamethonium		Ephedrine		Phenylephrine
Never		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Less than once		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Once		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
2 to 4 times		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
5 to 7 times		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
>7 times		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
5. Which of these drugs would you prefer to be available in pre-filled syringes?								
		Atropine		Suxamethonium		Ephedrine		Phenylephrine
Yes		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
No		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
Don't mind		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>
6. Have you ever had a critical incident related to the use of these drugs?								
Yes		<input type="checkbox"/>		No		<input type="checkbox"/>		
If Yes, please describe briefly:								
7. Comments if any:								

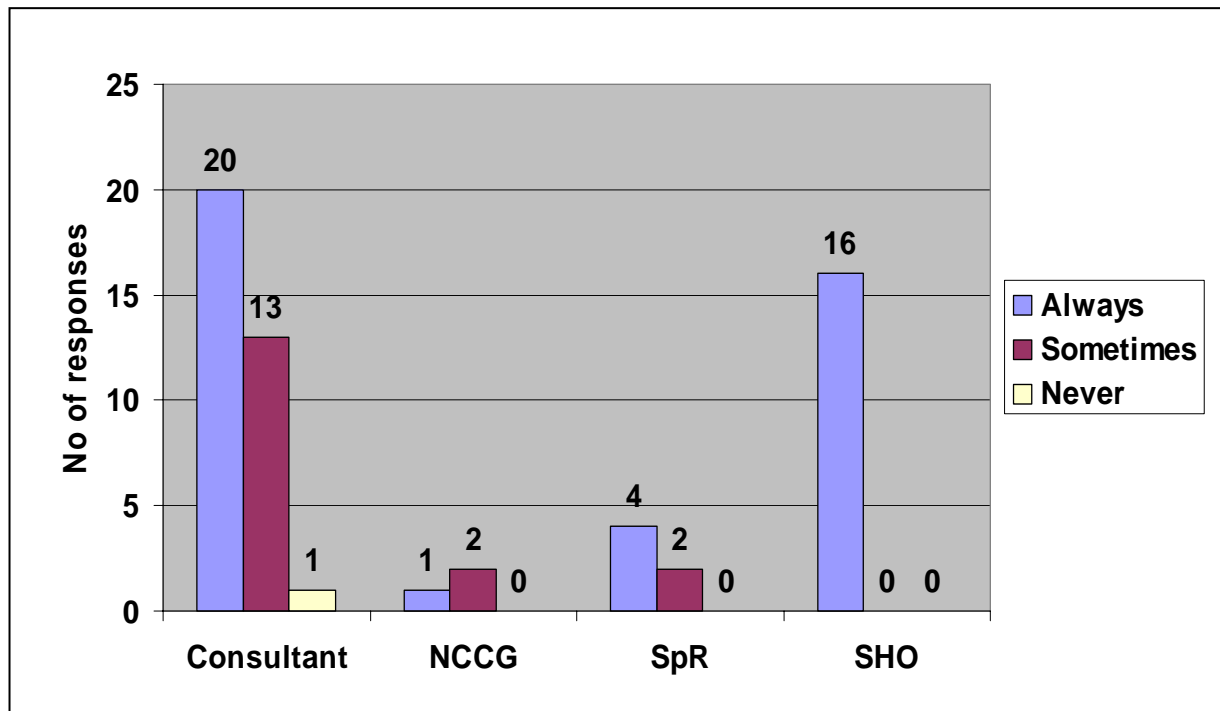
Results:

The questionnaire was sent to 68 anaesthetists and 59 responses were received. The response rate was 87%.

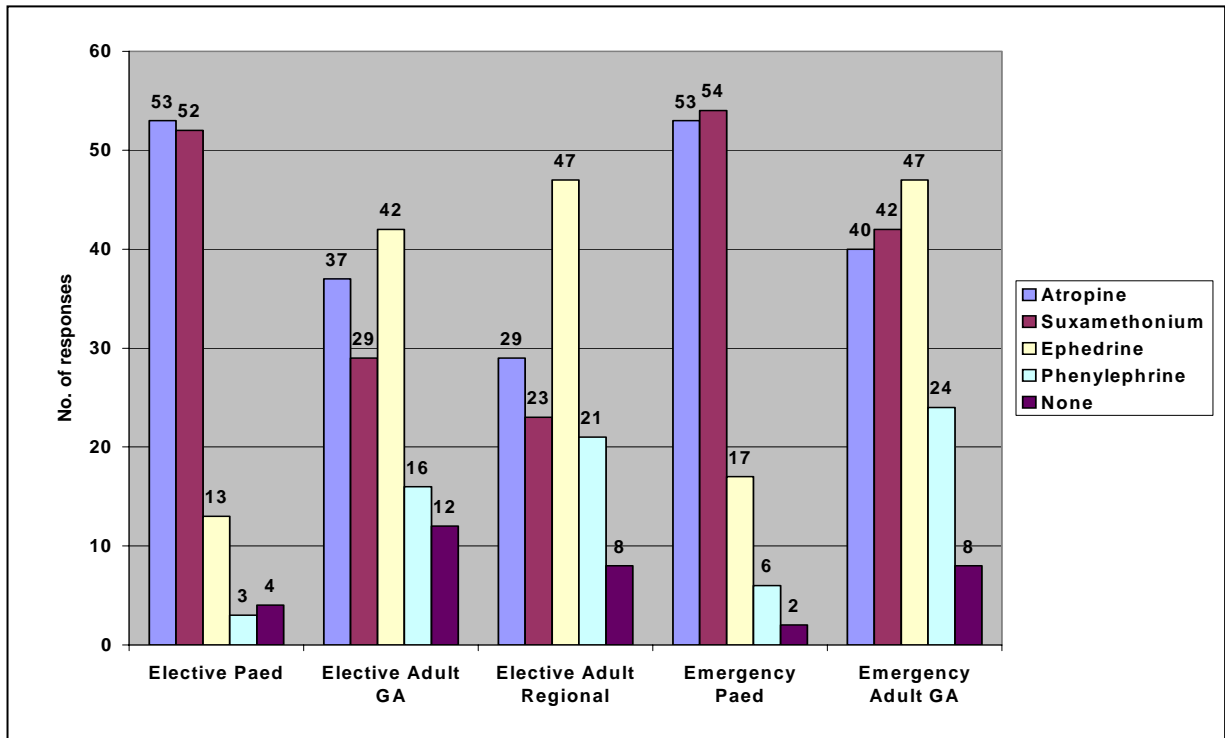
The **grade of anaesthetist** (question 1) who responded to the questionnaire is shown in the following table.

Grade of Anaesthetist	Number of responses (n=59)	Percentage
Consultant	34	58%
NCCG	03	27%
SpR	06	10%
SHO	16	5%

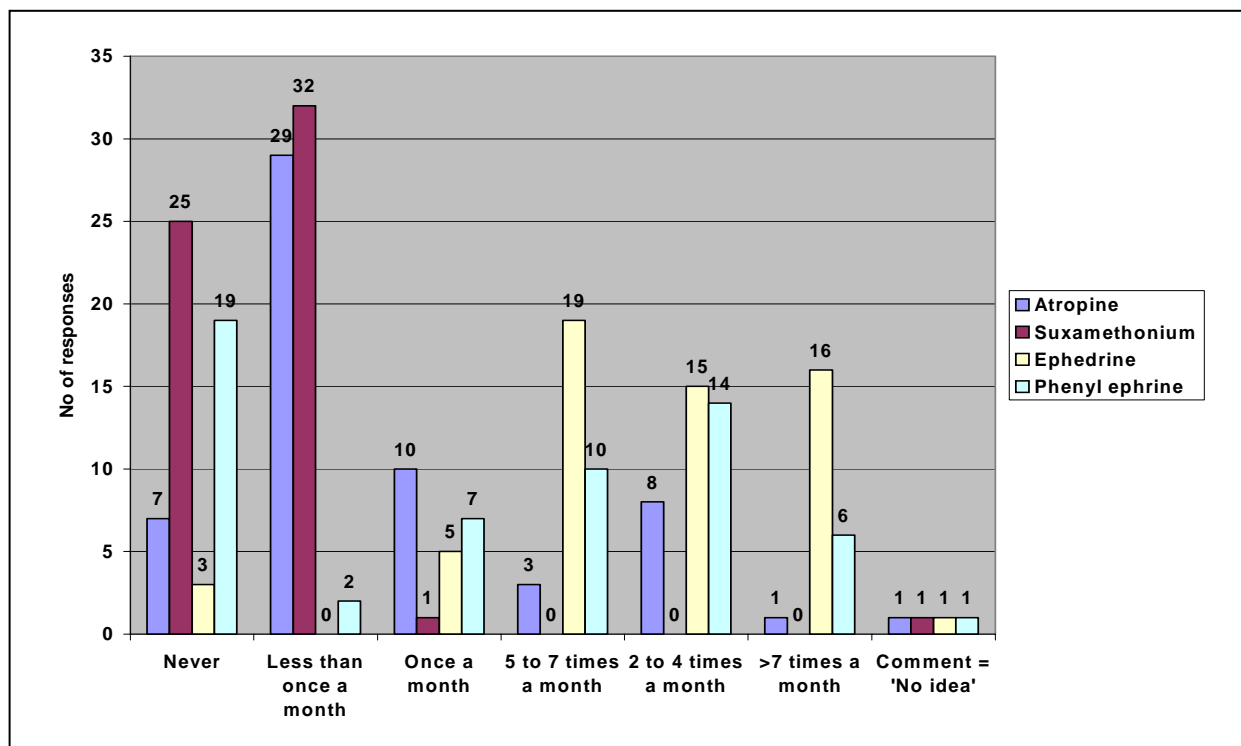
Analysis of answers to the question “**how often do you draw the above emergency drugs at the START of the list?**” (question 2) is shown in the following figure.



Results of the question “**which drugs do you draw?**” (question 3) for different types of theatre lists are shown in the figure below.



There was variation in the “**average monthly use of these predrawn emergency drugs**” (question 4). These findings are illustrated in the figure below.



Analysis of results to question 5 regarding “**preference to availability in pre-filled syringes**” revealed that less than 10% did not prefer the prefilled syringes for atropine and suxamethonium. Approximately 80% of the respondents preferred prefilled syringes for ephedrine and phenylephrine. Many of the “**comments**” (question 7) were **positive** regarding prefilled syringes.

Out of the 59 respondents, 17 reported experiencing a “**critical incident related to the use of these drugs**” during their anaesthetic career (question 6). These incidents included erroneous intravenous administration of suxamethonium instead of syntocinon, fentanyl or ondansetron; inadvertent injection of suxamethonium in the subarachnoid space and of ephedrine in the epidural space and anaphylactic reaction to intravenous administration of emergency drugs.

Conclusions and discussion:

Approximately 60 % respondents were consultant anaesthetists. More than half the senior members of staff including consultants and staff grade anaesthetists always draw these emergency drugs at the beginning of the every list. All the junior staff, mainly senior house officers always draw the drugs before the start of the list. If we assume that the best clinical practice is to have these emergency drugs readily available, our department has managed to impart that on our trainees as shown in figure 1.

Atropine, suxamethonium were the most commonly drawn drugs for all types of lists including elective and emergency. Ephedrine was the choice of vasoconstrictor than phenylephrine mainly in elective and emergency adult surgery as shown in figure 2. Even though atropine and suxamethonium were most commonly drawn drugs at the start of the list, they were very rarely used, almost always discarded and wasted.

Most anaesthetists experience at least one drug related error in their career. Only 28% anaesthetists reported critical incidents in this study. The major disadvantage of routine drawing up of these drugs is the risk of accidental injection (wrong drug, wrong patient, wrong time, wrong site, risk of paralysing an awake patient).

Recently published national survey of the attitudes and practices of New Zealand anaesthetists with regard to emergency drugs has demonstrated no uniformity of opinion or practice in New Zealand and indicate that many factors influence which drugs, if any, are predrawn before a case. Eighty-four per cent of respondents reported that their institution had no policy regarding the pre-drawing of emergency drugs in their workplace. Twenty-six per cent of respondents reported routinely pre-drawing such drugs, the majority indicating that they did this to avoid delay and to be prepared – some adding that assistants were too slow in drawing-up during emergencies. Thirty-seven per cent of anaesthetists reported having experienced delay, and 30% errors, while drawing up a drug at the time of a crisis. A number of

respondents indicated that the absence of predrawn emergency drugs increased the anaesthetist's stress level even if the patient's outcome was not affected by delay in administering a required drug. Contrary to the widely held view that emergency drugs are rarely used, 86% of respondents had used such drugs in the previous year, and 29% had required them more than five times.

Finally, the analysis was done to compare the cost of pre-filled syringes and the cost of drawing up the drug. This is shown in the following table.

	Pre-filled syringe		Self-drawn syringe
Drug	Cost	Shelf life	Cost
Atropine	£4.67	36 months	£ 0.95
Suxamethonium	£7.35	12 months	£ 1.15
Ephedrine	£4.97	24 months	£ 2.15
Phenyephine	Not available	Not available	£ 5.95

Currently a more detailed analysis of use of these drugs in the peri-operative period is under evaluation, in order to assess the viability of changing practice from using “self-drawn” to “prefilled” syringes for elective as well as emergency theatre lists. Irrespective of the results of this analysis, we believe that changing from using “self-drawn” to “prefilled” syringes constitutes the best clinical practice which will lead to reduction in critical incidents and improve patient safety.

Reference:

Webster CS, Merry AF, Ducat CM. Safety, cost and predrawn emergency drugs. *Anaesthesia* 2001; **56 (8)**:799–820.