APPENDIX 10
Drug Calculations

CALCULATING DOSES FROM PERCENTAGE SOLUTIONS:
The underlying principle of all drug dilutions is that a **100% solution** is **1 g** of drug in **1 ml** of volume (a '1 in 1' solution).
This solution has **100 g** of drug in **100 mls** of solution.
Therefore a **1% solution** of any drug = **1:100** solution = **1 g** in **100 ml** = **10 g** in **1 litre** = **10 mg** in **1 ml** = **10,000 mcg** in **1 ml**

Subsequent dilutions can be derived as shown in the table below (each row contains the same amount of drug):

Equivalent Drug Dilutions Expressed As:				
RATIO	**PERCENTAGE SOLUTION**	**GRAM PER 100 ml**	**MILLIGRAM PER MILLILITRE**	**MICROGRAMS PER MILLILITRE**
	%	**g / 100ml**	**mg / ml**	**mcg / ml** or **µg / ml**
1:100	1	1	10	10,000
1:200	0.5	0.5	5	5,000
1:1000	0.1	0.1	1	1000
1:10,000	0.01	0.01	0.1	100
1:100,000	0.001	0.001	0.01	10
1:200,000	0.0005	0.0005	0.005	5

EXAMPLES OF COMMON ICU DRUGS:
- 0.5% bupivacaine contains 5 mg in 1 ml (100 mg in a 20 ml vial)
- 0.2% ropivacaine contains 2 mg in 1 ml (40 mg in a 20 ml vial, 400 mg in a 200 ml bag)
- 2% lignocaine contains 20 mg in 1 ml (100 mg in a 5 ml vial)
- '1 in 1000' adrenaline contains 1 mg in 1 ml or 1000 mcg in 1 ml
- 10% calcium chloride contains 1 g in 10 ml; this is 6.8 mmol of calcium & 13.6 mmol of chloride
- 49.3% magnesium sulfate contains 493 mg in 1 ml; a single 5 ml vial therefore contains 2.465 g
- 8.4% sodium bicarbonate contains 84 mg in 1 ml; this is 23 mg (1 mmol or 1 mEq) of sodium & 61 mg (1 mmol or 1 mEq) of bicarbonate