Local anaesthetic dosing

This can be difficult/confusing as:

- Toxic/maximum doses are in miligrams yet local anaesthetic is given in mls and %
- It requires on the spot mental arithmetic

However get your head round this page and its actually quite straight forward to do!

How much lidocaine is in 10mls of 1% lidocaine?

- What do percentage solutions mean?
  - The percentage of weight of drug per **millilitre** of solution
  - Given 1ml of water weighs 1 gram (or 1000 milligrams)
  - If there is 1% lidocaine in the solution there must be 10 miligrams (1000 divided by 100) **per ml of solution**
  - Therefore in 10mls there must be 100 mg of lidocaine
- In practice this basically means multiply the percentage of solution by 10 and that is your mg/ml of local anaesthetic
  - Eg 0.25% bupivacaine is 2.5 mg/ml

Local anaesthetic toxicity

- These drugs act by blocking voltage gaged sodium channels -> preventing nerve conduction
  - Therefore in toxicity can affect cardiac and CNS conduction i.e arrhytmias and seizures
  - Make sure you are familiar with the treatment algorithm for local anaesthetic toxicity and know where your theatre's intralipid is kept
- Different LAs bind to cardiac/CNS sodium channels with differing affinity so their toxicity varies
- It is important to know the maximum safe doses for your local anaesthetics you use (see table)

Lidocaine	Lidocaine with adrenaline (1:100,000 or 1:200,000)	Bupivacaine	Prilocaine
3mg/kg	**7mg/kg**	**2mg/kg**	**6mg/kg**

How much local anaesthetic can I give?

- A question commonly asked by surgeons before they infiltrate the wound after they have closed
- Apply these simple steps to give a prompt and confident answer

Step 1 - work out how much 1% local anaesthetic you could give

[Patient weight ÷ 10] x max dose of LA = The **volume (in mls)** of LA you could give **if it was 1%**

Step 2 – scale up/down to your given percentage of local anaesthetic

Now simply divide (if LA % more than 1) or multiply (if LA % less than 1) and you have your answer in mls

Worked example

75kg patient having a lap appendix and the surgeon wants to infiltrate 0.5% bupivacaine and wants to know how much they can have:

Step 1 – work out how much 1% bupivacaine you could give

[75 ÷ 10] x 2 = 15mls of 1% bupivacaine

Step 2 – scale up/down to your given percentage of local anaesthetic

Given its 0.5% bupivacaine we can give twice as much volume compared to 1%, therefore we multiple by 2

15 x 2 = **30mls of 0.5% bupivacaine**