

Pharmacology 101 (Part 1) The Basics

Since the dawn of mankind mixtures of animal parts, plants and minerals to treat wounds, burns and ailments evolved from rudimentary pharmacological compounds into more sophisticated experiments to create focused medical treatments. Early man learned from instinct and by observing his surroundings. Water, a leaf or mud was his first soothing balm. Through trial and error he learned which best suited a particular situation and shared this knowledge with others. Although early man's methods were rather crude and unscientific, many of today's modern medicines sprung from sources as basic as those which were within the reach of early man. One of the things I found particularly interesting during my work in the USA is just how many new medications are released via the media on a daily basis. One simply has to sit in front of the TV and begin the count. There is simply no limit to the choices. A commercial generally runs something like this, "Use drug X, it will stop diarrhoea in its tracks". "Please contact your doctor if you experience any of the following side-effects while using drug X - depression, suicidal thoughts, itching, oozing, weeping, burning or sudden onset of intense chest pain". Wow! I ask, what is worse? Having a runny tummy or considering ending one's life (not to mention the itching, oozing and burning). I think I will settle for the runny tummy thanks very much. It's a consumer's nightmare.

So what's the point in highlighting the above you may ask? Well simply this. As emergency healthcare providers (at any level) we are exposed to many a patient who when asked if they are taking any medications, brings out the shopping bag and dumps it in front of us. Although the medications provide valuable information about what conditions the patient may have (or the patient's neighbour, which is often the source of many of those medications for some reason or other), it often adds a spin to administering any further meds. Hmm... What will interact with what? Will it make the current situation better or worse?...etc...etc... At times like this, I wish I was practicing healthcare in the days of the cavemen. "Here eat this leaf"

Recently I have been receiving many questions on some very basic concepts and terminology related to pharmacology. Given the expansive distribution of The Responder articles, I thought it would be a good idea to put pen to paper and do a basic overview of what it's all about. This article will run in two parts. Watch out for part 2 in the next edition of The Responder. These articles may be of particular value to all those who currently hold basic life support qualifications and have thus not necessarily received introductory training in pharmacology. So let's get going...

Some Basic Terminology...

Pharmacology

Pharmacology is the study of the sources, properties and nature of drugs and how the body reacts to them over a period of time. The discipline is effectively divided up into two phases, namely pharmacodynamics (what a drug does when it enters the body) and pharmacokinetics (how the body deals with the drug over a period of time). We'll discuss these in more detail later.

A drug

Any substance taken by mouth; injected into a muscle, blood vessel, or cavity of the body; inhaled; or applied topically to treat or prevent a disease or condition.

Indications

The reason/s for administering a particular medication/ drug or treatment.

Contra-indications

The factor/s that prevent/s the use of a particular medication/ drug. It's crucial that the right

questions are asked during your assessment of a patient. Patient's often don't offer up all the information on their own and proper questioning is the only thing saving you from a potential catastrophe.

Dose

The amount of a medication/ drug that is administered at one time. E.g. Take 500mg Amoxicillin every 12 hours.

Mechanism of Action

Mechanism of action is effectively how the medication/ drug works once administered. It's critical to have a good understanding of what effects the drug will have on the patient before you administer it. Administering a drug with no understanding of how it works will lead to some nasty surprises for both you and the patient.

Effects

Achieving the desired result/s following administration of a specific medication/ drug

Side Effects

These are the list of adverse effects that often occur in addition to the desired effect (or therapeutic effects). When making a decision to administer a particular medication, one needs to consider the therapeutic effects versus the side effects and if any bad side effects do occur, am I able to deal with them appropriately? This could mean having a bag-valve-mask device with supplemental oxygen on standby while administering intravenous Diazepam (Valium) to a patient with seizures. Why? Because a side effect of rapid IV administration can result in respiratory depression. So always be prepared.

Drug Naming

An individual drug usually has several names associated with it.

When a drug is first developed it is given a chemical name. This describes the chemical structure of the drug and is generally far too complicated for everyday use. Can you imagine asking for 5mg of 7-chloro-1,3-dihydro-1methyl-5-phenyl-1,4-benzodiazepin-2(3H)-one? This is the chemical name for Diazepam. Wow, quite a mouthful eh? Can you imagine ordering that name in an emergency situation? As such, it is easier to simply ask for 5mg of Diazepam.

The drug is then usually given a code name, which may be a shortened version of the chemical name. This is so that it can be easily referenced by researchers during trials etc...

Once the drug is approved by the regulating authority it is given a generic name (also called the official name) and a trade name (or brand name). The generic name will be shared by other drugs in the group (from other companies) provided they are comparable to each other in dosage form, strength, route of administration, quality and performance characteristics and intended use.

The trade name is developed and associated with the company who initially requested approval for the drug and is therefore the property of that company. Pharmaceutical companies invest a great deal of money in marketing trade names and it therefore makes perfect financial sense that these names are protected under patent.

Using the above example:

Chemical Name: 7-chloro-1,3-dihydro-1methyl-5-phenyl-1,4-benzodiazepin-2(3H)-one

Generic Name: Diazepam

Trade Name: Valium

Drug Scheduling and Monitoring

Drug registration and scheduling is the responsibility of the Medicines Control Council in South Africa. This function is carried out under the authority and in consultation with the

National Minister of Health.

The primary act governing medicines in South Africa is the Medicines and Related Substances Act, 1965 (Act 101 of 1965). This act is updated from time to time and these changes are Government Gazetted.

The table below shows the various scheduling levels of drugs in South Africa and some of the legalities associated with their use.

(Section 22A of Medicines and Related Substance Act 101 of 1965).

Schedule	Notes
0	Can be sold in an open shop
1	May only be sold by pharmacist, pharmacist intern or pharmacists assistant acting under the personal supervision of the pharmacist
2	May only be sold by pharmacist, pharmacist intern or pharmacists assistant acting under the personal supervision of the pharmacist
3	Only on prescription by 'authorised' prescriber. Repeats of up to 6 months, provided the prescriber has indicated
4	Only on prescription by 'authorised' prescriber. Repeats of up to 6 months, provided the prescriber has indicated
5	Only on prescription by 'authorised' prescriber. Repeats may be made provided the prescriber has indicated on the prescription the number of times it can be repeated as well as the intervals at which it can be repeated.
6	Only on prescription by 'authorised' prescriber and provided that the maximum course of treatment does not exceed 30 consecutive days and it may not be repeated. A new prescription has to be issued each time.
7	Not available in pharmacies - special permission required from Director General to be in possession of these
8	Not available in pharmacies - special permission required from Director General to be in possession of these

Written by: Gavin Sutton

www.be-safe.co.za