

AcnePSP Question and Answer

What's the difference between a medicine, a drug, a chemical and an active ingredient?

Lots of us get confused by terminology. Because acne is a condition that varies from mild to very severe, a wide range of treatments are available via a number of different routes. Treatments that are prescribed by doctors are called *medicines*, *medications* or *medicinal products*. All *prescription medicines* contain one or more *active ingredients* as well as some inactive ones. Inactive ones are added, for example, to cover up a bitter taste, to help absorption into the skin or to enhance the cosmetic properties of the product.

The active ingredients in medicinal products are often referred to as *drugs*. In other words, in the case of a medicine obtained from a doctor for treating acne, the active ingredient will always be a drug. A drug is a substance that produces a beneficial change in the functioning of the body which results in improvement of one or more symptoms of acne.

Not all medicines require a doctor's prescription. If you go into a pharmacy or supermarket and buy something to treat acne or spots from the open shelves, it might be a medicine on the *general sales list* but it is more likely to be a cosmetic. The third category is called a *pharmacy medicine* because it is not freely available on the open shelves and has to be asked for. Pharmacy only medicines are not sold in supermarkets. General sales list medicines and pharmacy medicines are collectively known as over-the-counter medicines (see <http://www.pagb.co.uk/regulatory/access.html>). Confusing isn't it?

To recap, three types of medicinal product are used to treat acne: prescription only medicines, pharmacy medicines and general sales list medicines. The active ingredient in all of them will be a drug. All drugs have risks (side effects) as well as benefits. For medicines on the general sales list, safety is the primary concern whereas for prescription medicines how well they work becomes more important and some side effects might be expected. Pharmacy only medicines fall in the middle in that they may be more effective than general sales list products but they may also have more side effects.

'*Chemical*' is one of those words we all think we understand and which for many people has very negative connotations. Chemicals have gained a bad reputation but there are good chemicals and bad chemicals and chemicals that can be both good and bad depending how they are used. The word chemical simply means a substance which has a distinct and constant molecular composition. For example, water is a chemical which always contains one molecule of hydrogen and two molecules of oxygen whereas table salt always contains one molecule of sodium and one molecule of chlorine. Both water and table salt are simple chemicals. Drugs are also chemicals but often much more complicated ones than water and salt. A drug is a chemical that has a well understood beneficial effect on the body and which might also have undesirable effects in some people some of the time. Often, the bits of the molecule that are needed for the good effects also contribute to the side effects and so cannot be removed without loss of effectiveness.

Nearly all chemicals have biological effects whether or not we sometimes use them as drugs. Lots of people say they prefer 'natural' remedies, things like botanical extracts or Chinese herbs. These are full of chemicals, often very complex ones and sometimes ones we know very little about in terms of

their biological effects. Depending on the concentration, some of them might have drug-like properties when ingested or rubbed into the skin. Vitamins, which we all regard as essential for good health, are also chemicals and can be bad if ingested in excessive amounts.

Many chemicals and therefore many drugs, are good for us within a particular range of concentrations and become increasingly harmful if we are exposed to larger amounts. Salt is a useful example. A small amount of salt in the diet is essential as sodium is critical for normal functioning of our bodies. No-one would drink a glass of salt water because we all know too much salt is very bad for us. Botox is another good example. Exceedingly tiny amounts have a range of well-known beneficial cosmetic effects but botox is actually a powerful toxin made by bacteria that is lethal if ingested in very small quantities.

Remember that everything we use topically or orally to treat acne contains chemicals, whether or not the product is a medicine. If you'd like to know more about the chemicals in cosmetic remedies for spots, why not take a look at the Skin Deep database (www.ewg.org/skindeep/site/about.php)? You can even look up what's in a product via your smartphone before you buy it. Package inserts will tell you exactly what's in your acne medication – the active ingredient as well as any inactive ones. If you are unsure whether a product you've bought is a medicine or not, look for the license number on the box. It will usually be in the format PL 01234/0123. The best way of not being scared by chemicals in acne treatments is to know more about them.

Summary box

- Medicines contain active ingredients called drugs
- Medicinal products for acne, especially topically applied ones, also contain inactive ingredients
- Drugs and inactive ingredients are chemicals
- A chemical is simply a substance of constant molecular composition like water or salt
- Not all chemicals are bad or toxic
- Whether a chemical has good or bad effects usually depends on its concentration – some chemicals are harmful in very tiny amounts, others only become harmful at very high concentrations
- Drugs have well characterised beneficial effects over a range of concentrations that have been accurately determined
- At beneficial concentrations, some drugs might also produce unwanted effects in some people some of the time
- The risks and benefits of drugs are used to decide whether products containing them should be available only on prescription
- Treatments for spots that are taken by mouth or rubbed into the skin will always contain chemicals even if they aren't medicines - that is true of cosmetic remedies, herbal/botanical remedies and dietary supplements