The aspirin story: additional information

Conditions and ways that aspirin helps to cure them

* Pain – analgesic
* Fever – antipyretic
* Inflammation – anti-inflammatory
* Rheumatism – antirheumatic
* Myocardial infarction (heart attack)

Side effects

* Aspirin can lead to irritation of the lining of the stomach and possibly stomach ulcers.
* There is a possible link between taking aspirin and Reye’s syndrome - a rare disorder that can cause severe liver and brain damage in children and young adults who are recovering from a viral infection.

Nomenclature

A variety of names are commonly used for aspirin. Generally, the everyday or industrial names are less complex than the systematic names.

The name given to aspirin is 2-ethanoyloxybenzenecarboxylic acid, but when carrying out your own research you may also come across the names 2-acetoxybenzoic acid or acetylsalicylic acid.

Chemistry of aspirin

Aspirin is an ester, which is formed by joining an alcohol with a molecule derived from a carboxylic acid.

Aspirin can be made more soluble by its reaction as an acid with aqueous sodium hydroxide.

**Acid + base** $\rightarrow $ **salt + water**

aspirin + sodium hydroxide $\rightarrow $ sodium salicylate + water

This reaction is effectively reversed when soluble aspirin reaches the hydrochloric acid in the stomach.

sodium salicylate + hydrochloric acid $\rightarrow $ aspirin + sodium chloride

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| The structural formula of salicin**Salicin**(**2-(hydroxymethyl)phenyl β-D-glucopyranoside)** | The structural formula of salicylic acid**Salicylic acid**(2-hydroxybenzoic acid) |
| The structural formula of aspirin**Aspirin**(2-ethanoyloxybenzenecarboxylic acid) | The structural formula of sodium salicylate**Sodium salicylate**(sodium 2-ethanoyloxybenzenecarboxylate) |

Methods of establishing the safety and efficacy of medicines

* ‘Clinical trial’ – usually near the end of the medicine testing procedure where the compound is tried out on one group of patients and compared with the effect of a placebo on another group.
* In the late 1800s, compounds were given to patients almost immediately after synthesis or discovery.
* Following several high-profile incidences of new drugs leading to severe, sometimes fatal, side-effects, legislation was introduced in the 20th century to require animal testing before human trials could be carried out.
* A common way of testing anti-inflammatory action is to irritate the joint of a rat’s leg until it is inflamed and then administer the medicine.
* In your presentation you may wish to include a section on the ethics of animal testing (optional).