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.

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\text{Acid} + \text{base} \rightarrow \text{salt} + \text{water}
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\text{aspirin} + \text{sodium hydroxide} \rightarrow \text{sodium salicylate} + \text{water}
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This reaction is effectively reversed when soluble aspirin reaches the hydrochloric acid in the stomach.

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\text{sodium salicylate} + \text{hydrochloric acid} \rightarrow \text{aspirin} + \text{sodium chloride}
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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).