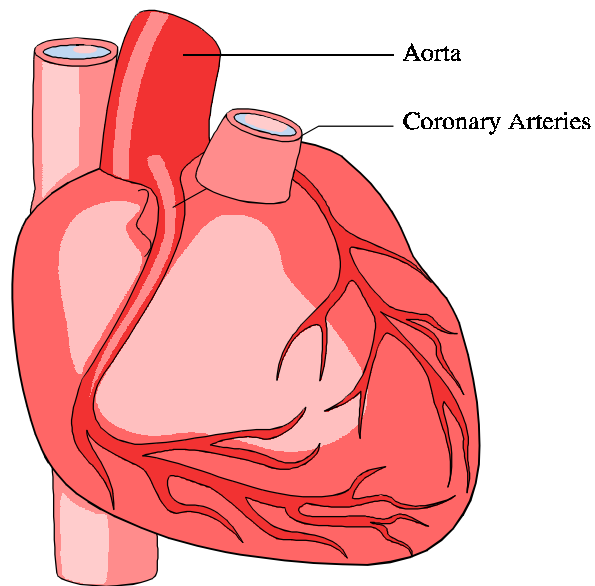


Pittsburgh EMS Pre-Hospital Care Monograph



ASPIRIN

Dedicated to the professional men and women of Pittsburgh EMS.

This monograph was created by the Medical Directors of Pittsburgh EMS with the assistance of the City of Pittsburgh, EMS Training Division.

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overview

Aspirin, acetyl derivative of salicylic acid, is a commonly used over the counter medication used to reduce fever; relieve headache, muscle, and joint pain; and reduce inflammation, caused by injury and arthritis. Side effects of aspirin include nausea, vomiting, diarrhea, and gastrointestinal bleeding. Aspirin's ability to inhibit the formation of blood clots, has led to its use, in low doses, to prevent heart attack and stroke and to control unstable angina.

history

In the 5th century BC, Hippocrates used a bitter powder from the bark of the willow tree to treat aches and pains. The beneficial substance turned out to be salicylic acid. Sodium salicylate was used in the 19th century as an analgesic and antipyretic. In the 1890s German industrial chemist Felix Hoffman synthesized acetylsalicylic acid in an attempt to find a compound less irritating to the stomach. Hoffman's superiors at Bayer and Company named the new compound aspirin (i.e., Bayer Aspirin) in 1897.

It wasn't until the early 1970s that studies reported that aspirin inhibits the production of prostaglandins and thromboxanes which are naturally occurring substances in the body involved in inflammation, vasoconstriction and platelet aggregation. Researchers showed that, by blocking the synthesis of prostaglandins, aspirin prevented blood platelets from aggregating, one of the initial steps in the formation of blood clots.

This new found knowledge of how aspirin works set the stage for the new role of aspirin as a potential agent in treating or preventing conditions in which blood clotting play a role such as heart attack and stroke.

Today, Americans consume about 80 billion aspirin tablets a year, and more than 50 nonprescription drugs contain aspirin as the principal active ingredient. At low doses, aspirin inhibits platelet aggregation and interferes with blood clotting. In some what higher doses, it reduces fever and relieves aches and pains. In relatively large doses, aspirin reduces pain and inflammation in rheumatoid arthritis and related diseases.

**use in
unstable
angina and MI**

Stable angina is characterized by intermittent episodes of chest pain, lasting minutes (usually 5-15 minutes) associated with exercise or stress and relieved by nitroglycerine. Unstable angina is a more serious condition and is characterized by a worsening of existing angina, chest pain at rest or new onset of angina.

A heart attack or myocardial infarction (MI) results from the blockage of blood flow through the coronary arteries. A theorized sequence of events leading to MI begins with the gradual build-up of plaque (atherosclerosis) in the coronary arteries. Circulation through these narrowed arteries is restricted, often causing the chest pain known as angina pectoris. An acute heart attack is believed to happen when a tear in plaque inside a narrowed coronary artery causes platelets to aggregate, forming a clot that blocks the flow of blood. Without an adequate blood supply, the affected area of muscle dies and the heart's pumping action is impaired. In theory, aspirin might prevent platelet aggregation, vasoconstriction, and blood clotting.

About 1,250,000 persons suffer heart attacks each year in the United States, and about 500,000 of them die. Survivors of a first heart attack are at greatly increased risk of having additional cardiovascular events.

To investigate whether aspirin could be helpful in preventing or treating cardiovascular disease, researchers have carried out several large randomized controlled clinical studies. In these studies, patients were randomly assigned to receive either aspirin or a placebo, an inactive, look-alike tablet. The participants--and in double-blind trials the investigators, as well--do not know who is taking aspirin and who is swallowing an aspirin

The results have demonstrated that aspirin, when started within 24 hours of the onset of MI, reduced overall mortality almost to the same degree as thrombolytics. (ISIS-2 trial) The studies showed that aspirin substantially reduced the risk of death and/or non-fatal heart attacks in patients with a previous MI or unstable angina which often occurs before a heart attack. In addition, aspirin has been shown to maintain vessel patency in patients who had undergone coronary artery bypass grafting and angioplasty. The American Heart Association (AHA) calls aspirin the most cost effective agent available for acute MI and unstable angina.

Long term use of aspirin is more controversial. Currently the FDA recommends antiplatelet therapy only for patients with unstable angina and patients who have already suffered MI, and to reduce secondary strokes in men (but not women). This is an area of active study.

**aspirin for pre-
hospital care**

With the addition of aspirin to the Pennsylvania State Drug List in 1996, the drug is now available for use in the pre-hospital setting. Aspirin is an important drug used in the treatment of unstable angina and MI in the Emergency Department. The AHA recommends giving aspirin as soon as possible. This would suggest that giving aspirin in the field might be beneficial. Unfortunately, there are no studies to support or detract from this theory.

Pittsburgh EMS	<p>The plan of the Medical Directors is to add aspirin to the Pittsburgh EMS Drug Box for use in conjunction with the Chest Pain Protocol. At this time, all aspirin will be by physician order. Although aspirin is an over the counter medication, the drug may only be administered by paramedics via direct order. (In the future, aspirin may become part of the standing orders of the Chest Pain Protocol.)</p> <p>Aspirin will be administered to patients with chest pain of cardiac origin with suspected unstable angina or acute MI. Remember, aspirin is being administered to possibly reduce blood clotting and vasoconstriction in the heart. The drug it self is not given as a therapeutic trial to see if it relieves chest pain.</p>
dosage and administration	<p>The proper dose of aspirin is not clear but ranges in the literature from 80mg (1 baby aspirin) to 325mg (1 regular strength adult aspirin). The tablet(s) should be chewed first and then swallowed. Our protocol recommends 4 baby (80mg) tablets.</p> <p>Remember, aspirin's anti-platelet activity occurs only at low doses. Therefore, if a patient has already taken a daily aspirin, paramedics should not administer additional aspirin. In the case of aspirin for chest pain, more is not better, and may make things worse.</p>
precautions and contraindications	<p>There are numerous precautions that must be kept in mind before administering aspirin. Most of the precautions and warnings associated with aspirin are with chronic use. However, a subset of the population is allergic to aspirin and should not receive the drug. Aspirin allergy is common in asthmatics so take extra precautions with these patients</p> <p>Patients who are actively bleeding, have bleeding disorders or are taking blood thinners should not routinely receive aspirin. Aspirin should be avoided during pregnancy</p>
additional precautions	<p>Aspirin primarily causes gastrointestinal problems (nausea, heartburn, stomach pain, ulcers, gastrointestinal bleeding). Aspirin has also been associated with hemorrhagic stroke in a small percentage of patients who use the drug regularly, although the majority of regular users have no problem with internal bleeding.</p> <p>Aspirin should be used with caution in patients with uncontrolled high blood pressure, liver or kidney disease, peptic ulcer, or other conditions that might increase the risk of cerebral hemorrhage or other internal bleeding. Aspirin should not be used to treat children and teenagers who have chickenpox or the flu because of the risk of Reyes syndrome, a rare but sometimes fatal condition.</p>

overdose and chronic toxicity

Acute toxicity in adult patients usually presents with GI distress, hyperventilation, and metabolic acidosis. As the poisoning progresses lethargy develops along with cardiovascular disorders and pulmonary edema.

In contrast, chronic toxicity lacks GI symptoms. Patients present with CNS abnormalities such as confusion and hallucinations. Tinnitus, ringing in the ears, can be seen with aspirin toxicity.

ASPIRIN

Generic Name	Aspirin [Acetylsalicylic acid (ASA)]
Trade Names	Alka-Seltzer, Bayer, Bufferin, Ecotrin
Drug Class	Antiplatelet, NSAID, Salicylate
Indications/Clinical Uses	fever, headache myalgia, neuralgia, dysmenorrhea, osteoarthritis, rheumatoid arthritis, prophylaxis against MI combined with thrombolytic therapy, post AMI
Pharmacodynamics	Clotting: decreases platelet aggregation Pain: blocks pain reception Fever: reduces fever Inflammation: relief of symptoms by blocking prostaglandins
Adverse reactions and side effects	GI: nausea, vomiting, mucosal irritation and bleeding, associated with peptic ulcers Resp: hyperventilation, altered acid-base balance CNS: Salicylism (tinnitus, HA, N/V, dizziness), agitation
Pharmacokinetics	weak acid, rapidly absorbed

Please go to the latest version of the chest pain protocol