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Patient information: Chest pain (Beyond the Basics)

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CHEST PAIN OVERVIEW

It is hard to know what to do when you feel pain or discomfort in the chest. Is it a heart attack or another, less serious problem? Because chest pain can be a sign of a heart attack, it is important to seek help and get treatment as quickly as possible.

The important causes, typical signs and symptoms, diagnostic tests, and initial treatment of chest pain will be reviewed here.

CHEST PAIN CAUSES

Chest pain generally originates from one of the organs in the chest (heart, lung, or esophagus) or from the components of the chest wall (skin, muscle or bone). Occasionally, organs close to the chest, such as the gall bladder or stomach, may cause chest pain. Pain in the chest may also be the result of neck pain that is referred to the chest, called referred pain.

Angina — All organs and tissues in the body require oxygen and nutrients carried in the blood. The heart pumps oxygen and nutrient-rich blood through a huge network of arteries throughout the body, which includes vessels that supply blood to the heart muscle. These vessels, called coronary arteries, lie on the surface of the heart muscle and branch into smaller vessels located within the muscle ([figure 1](#)).

In people with coronary heart disease (CHD), the coronary arteries become clogged with fatty deposits ([figure 2](#)). The deposits, called plaques, cause the coronary arteries to narrow and may prevent a normal amount of oxygen-rich blood from reaching the heart muscle. This is called cardiac ischemia. Angina is the term for chest pain caused by ischemia.

Angina is particularly common during physical activity, when the heart rate and pressure are increased due to the heart's demand for more oxygen. Angina develops if the demand for oxygen exceeds the amount of oxygen delivered.

Heart attack — A heart attack, or myocardial infarction (MI), occurs when the surface covering of a fatty plaque ruptures. A blood clot (thrombus) can form on the plaque, which can partially or completely block the artery. This blockage slows or blocks blood flow to the area of heart muscle fed by that artery. If this continues for more than 15 minutes, the muscle can become damaged or infarcted (that is, the tissue in that area dies) ([figure 1](#)). During a heart attack, the patient may feel a discomfort that is similar to an episode of ischemia. A heart attack results from a prolonged period of angina.

Describing chest pain — Chest pain caused by angina or a heart attack may be similar to or different from chest pain caused by other conditions. Depending upon the cause, chest pain can have varying qualities (sharp, dull, burning), can be located in one or several areas (middle of the chest, upper chest, back, arms, jaw, neck, or the entire chest area), pain may improve or worsen with activity or rest, and there may be other associated symptoms (sweating, nausea, rapid heart rate, shortness of breath).

- **Quality of the pain** — Patients with ischemia of the heart are likely to report chest discomfort rather than pain. A person may describe their pain as squeezing, tightness, pressure, constriction, strangling, burning, heart burn, fullness in the chest, band-like sensation, knot in the center of the chest, ache, heavy weight on chest (like an "elephant sitting on the chest"), or like a bra that is too tight. In some cases, the discomfort cannot be described, but the patient places a fist in the center of the chest, known as the "Levine sign."

People without ischemia may describe their pain as sharp or stabbing.

- **Location of the pain** — Ischemic chest pain is usually not felt in any specific spot, but rather throughout the chest. The patient may actually have difficulty saying exactly where the pain is. Cardiac pain often involves the center of the chest or upper abdomen.

If the pain is felt only on the right or left side, and not in the center of the chest, it is less likely to be cardiac ischemia. If the patient is able to point with a finger to one area of pain, it is unlikely to be caused by cardiac ischemia.

- **Radiation of pain** — The chest pain of cardiac ischemia often spreads to other areas of the upper body. This may include the neck, throat, lower jaw, teeth (feeling like a toothache), or the shoulders and arms. Sometimes, pain is felt in the wrists, fingers, or back (between the shoulder blades).
- **Timing of the pain** — Ischemic pain tends to come on gradually and get worse over time; it generally lasts from 2 to 5 minutes after resting if it is related to exertion.

In contrast, noncardiac pain can begin suddenly and feel worst in the beginning. It is often unrelated to exertion. Noncardiac pain may last only a few seconds or may persist for hours. Pain may improve with nitroglycerin or may persist and be severe. Pain that has been constant over days or weeks is not likely to be angina or a heart attack.

- **Things that make the pain better or worse** — The patient will be questioned carefully about things that make the pain better or worse. For example, if the pain begins during an activity that increases physical exertion, such as walking up stairs, sexual intercourse, or raking leaves, and the pain is relieved within minutes of resting, it could be angina. The reason for this is that exercise increases the heart's need for oxygen-rich blood, and the need decreases as the person rests. Other things that can increase oxygen demand in the heart include emotional stress, exposure to cold, and eating a meal.

If the pain is relieved with nitroglycerin, a medicine used to treat angina, it suggests (but does not prove) that ischemia is the cause. Other conditions, especially muscular spasms or esophageal spasm, may also improve with nitroglycerin. If eating a meal or taking antacids always relieves the pain, it could be caused by a problem with the esophagus or stomach.

Finally, the pain of ischemia is not usually affected by taking a deep breath or by pressing on the area of discomfort. Ischemic pain tends to be the same regardless of body position, although some patients with ischemia feel relief when sitting up, especially if they lean forward.

