6.8: Antianginal – Nitrates

Antianginal medication is used to treat angina pectoris. Angina is chest pain caused by inadequate blood flow, resulting in hypoxia of the cardiac tissue. Angina can be chronic pain caused by atherosclerosis in coronary artery disease or acute pain caused by a myocardial infarction.

Antianginals increase blood flow to the heart or decrease oxygen demand by the heart. Nitrates promote vasodilation of coronary arteries and veins. Beta blockers and calcium channel blockers are also used to decrease workload of the heart and decrease oxygen demands.

Nitrates may come in a variety of routes, such as sublingual, extended-release tablets, creams, transdermal patches, and intravenously. The grid below focuses on administration via sublingual tablets. Sublingual tablets are prescribed PRN (“as needed”) for patients who are experiencing chronic, stable angina due to coronary artery disease.

**Mechanism of Action**

Nitroglycerin relieves angina by relaxing vascular smooth muscle, resulting in vasodilation.

**Indications for Use**

Nitroglycerin is used to relieve angina due to coronary artery disease, during times of an acute attack, or prophylactically.

**Nursing Considerations Across the Lifespan**

Patients taking sildenafil (Viagra) or similar medications for erectile dysfunction in the previous 24 hours may not take nitroglycerin as this may result in a dangerous drop in blood pressure.
Nitroglycerin should not be used in pregnant women or those who are breastfeeding.

Nitroglycerin is contraindicated in patients who have severe anemia, increased intracranial pressure, hypersensitivity, or circulatory failure.

**Adverse/Side Effects**

Patients taking nitroglycerin may experience hypotension, palpitations, headache, weakness, sweating, flushing, nausea, vomiting, or dizziness.

Patients should allow medication to dissolve under their tongue. This route allows immediate absorption into the circulation and avoids first-pass metabolism by the liver. Patients may take up to one tablet every 5 minutes, up to 3 sublingual tablets within 15 minutes to relieve chest pain. If chest pain is not relieved after the first dose, 911 should be called. Nitroglycerin may also be used prophylactically 5 to 10 minutes prior to engaging in activities that might precipitate an acute attack.

**Patient Teaching & Education**

Instruct patients to avoid eating or smoking during administration as this may alter absorption. Patients should sit during administration to decrease the risk for injury due to the possibility of hypotension, dizziness, and weakness. Nitroglycerin decomposes when exposed to heat or light, so it should be stored in the original, airtight glass container. See Figure 6.24[1] for an image of nitroglycerin containers.

Historically, patients have been taught to seek emergency help (call 911) if pain persists after the 3rd dose of medication. However, new guidelines from the American Heart Association urge patients to call 911 after the first dose if symptoms are not improved or become worse.

Figure 6.24 Sublingual nitroglycerin should be stored in its original, air tight glass container
Now let’s take a closer look at the medication grid for nitroglycerin in Table 6.8.

Table 6.8 Nitroglycerine Medication Grid

<table>
<thead>
<tr>
<th>Class/Subclass</th>
<th>Prototype-generic</th>
<th>Administration Considerations</th>
<th>Therapeutic Effects</th>
<th>Adverse/Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrate</td>
<td>nitroglycerin</td>
<td>Patients may take up to 3 sublingual tablets within 15 minutes (1 every 5 minutes) to relieve chest pain</td>
<td>Decrease chest pain</td>
<td>Hypotension and palpitations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If symptoms are not improved after the first dose or become worse, or if the pain persists after the 3rd dose of medication, seek emergency help (call 911). Nurses should check BP after each dose</td>
<td></td>
<td>Headache, weakness, sweating, flushing, nausea, vomiting, and dizziness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No eating or smoking during administration of SL tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Do not chew or crush SL tablet</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Advise patients to sit while taking this medication</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Critical Thinking Activity 6.8

A patient was administered the first dose of nitroglycerin at 1305 for acute angina. What should the nurse evaluate after administration?

Note: Answers to the Critical Thinking activities can be found in the “Answer Key” sections at the end of the book.

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