

What are digitalis and inotropes?

Digitalis is a derivative of the foxglove plant used to treat heart failure and some heart rhythm problems (including [atrial fibrillation](#)). It increases the strength of the heart muscle's contractions, improving the heart's pumping ability, and slows down the heart's rhythm. In women with heart failure, digitalis does not improve survival, but it can relieve symptoms and reduce the need for hospitalization in patients whose symptoms are not controlled by standard treatment of an ACE inhibitor, a beta-blocker, and diuretics.

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Drugs that affect the strength of the heart's muscle contractions are called *inotropes*. Several other drugs in addition to digitalis have inotropic effects, but these have limited use in heart failure patients. They are given through an a line in your vein (intravenous, IV) and should only be used in the hospital in women with severe, late-stage heart failure (

[Stage D](#)

) when other drugs have failed to provide comfort.

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Digitalis Drugs

Generic Names:	Digoxin	Digitoxin
Brand Names:	Lanoxin, Lanoxicaps, Digitek	
How it is given:	By mouth (tablet, caplet, or liquid), injection (IV)	
What it is used for:	<ul style="list-style-type: none">- To relieve symptoms in patients with heart failure- To treat certain heart rhythm disorders, such as atrial fibrillation and atrial flutter	

You should not be treated with it if you:

- Are allergic to digitalis drugs
- Have high blood potassium levels
- Are taking certain medicines for fungal infections (ketoconazole, itraconazole)
- Have poor kidney function (digoxin)
- Your heart has certain problems conducting electrical signals (sinus block, atrioventricular block, o
- Have certain types of heart muscle disease (hypertrophic or restrictive cardiomyopathy, amyloid he

You should be closely monitored if:

- **You are already taking** potassium supplements, since the combination may cause your potassium

Pregnancy/nursing:

The effects of digitalis on the fetus are not known, so it should only be used

How does digitalis work?

Digitalis works in several ways. It works directly on the cardiac muscle by blocking an enzyme that controls the flow of sodium and potassium in and out of the heart muscle cells. This results in higher concentrations of calcium inside the cells, which signals the heart muscle to contract. More calcium means stronger heart muscle contractions.

Digitalis also works on the nervous system, signaling it to slow down the heart rate and slow down the speed that the heartbeat's electrical signal is transmitted through the heart, allowing the heart more time to fill with blood. The nervous system also signals the kidneys to deactivate certain kidney hormones, relaxing blood vessels and reducing the heart's workload.

Who should receive digitalis to prevent or treat heart failure?

Digitalis is not a first-choice drug for the treatment of heart failure. However, it may be useful in women with mild to moderate [systolic heart failure](#) who still have symptoms despite standard treatment with [ACE inhibitors](#) , [diuretics](#) , and [beta-blockers](#)

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It can also be added at the beginning of treatment to get a quick response in women who have severe symptoms but in whom the standard drugs have not yet started having an effect.

In these women, digitalis can relieve symptoms, improve exercise capacity, improve the heart's pumping ability (measured by [ejection fraction](#)), and reduce the need for hospitalization. When blood levels of the drug are kept to a safe level, they do not appear to have any effect on survival.³ In the largest study so far, which

included 6800 patients with systolic heart failure (22% were women), patients taking digoxin were nearly 30% less likely to be hospitalized for worsening heart failure.

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Results in women alone were not reported.

Digoxin is also used to treat women who have [atrial fibrillation](#) and [systolic heart failure](#).² The benefits of digitalis in women who have [diastolic heart failure](#)

(blood filling problems) are not as clear, and few studies have examined their use in these patients.

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In one study of 916 patients (36% were women), researchers found that digoxin was just as effective in patients with diastolic heart failure as in those with systolic heart failure, reducing the need for hospitalization by 20%.

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However, another study of 988 patients (41% were women) found that digoxin did not reduce hospitalization in patients with mild to moderate diastolic heart failure compared with placebo.

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Neither study found that digoxin had an effect on survival, and neither reported results in women separately.

Does digitalis have different effects in women and men?

Since the original large studies of digoxin in heart failure treatment in the late 1990s, it has become apparent that different blood levels of the drug can have very different effects. Low levels are deemed safe and higher levels increase the risk of drug toxicity, which can lead to death.⁶ For this reason, it is very important that blood levels of this drug are carefully monitored and that all patients are given the lowest possible dose that controls symptoms. Based on current evidence, digoxin levels in the blood should be kept between 0.5 and 1.0 ng per mL to achieve the greatest benefits at minimal risk.²

Who should NOT receive digitalis?

Digitalis should not be used in women who have structural changes in the heart that indicate heart failure, but have not yet developed heart failure symptoms (stage B heart failure) and do not have heart rhythm problems.² In these women, the risks of the drugs outweigh the benefits.

These drugs should not be used or used carefully in women who have recently had a heart attack, especially if they still have reduced blood flow to the heart caused by narrowed or blocked vessels.²

Are there any alternative to digitalis?

The main alternatives to digitalis drugs to control heart failure symptoms that persist despite standard heart failure treatment are advanced therapies like [pacemakers](#) and intravenous inotropic drugs (in patients with severe symptoms).

My doctor has prescribed digitalis. What should I watch out for?

Digitalis drugs are generally very well tolerated, and produce side effects in only 1 in 100 patients.⁷ Still, establishing the appropriate dose of digitalis is extremely important, especially in women, since levels that are too high can actually increase a woman's risk of dying.⁶ You will need to have regular blood tests to measure the amount of the drug in your blood.

Because digitalis slows the conduction of the electrical impulses in the heart, the medication can sometimes interfere with the normal heartbeat, causing irregular or skipped beats, or even causing the electrical signal not to reach the entire heart (known as heart block). This can usually be avoided by carefully tailoring the dose to your body and medical profile.

Digitalis Side Effects To Watch For

Immediately contact your doctor to have your dose adjusted if you experience:

- loss of appetite
- nausea
- vomiting
- diarrhea
- blurred vision
- headache
- dizziness
- feeling anxious or depressed

Certain other medications can interact with digoxin and its affects, so you should be started on the drug carefully if you are already taking [beta blockers](#) , certain heart rhythm drugs such as amiodarone (Pacerone/Cordarone), verapamil, or quinidine, antibiotics (including azithromycin, clarithromycin, erythromycin), or antifungals (itraconazole, ketoconazole).

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References

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