

Alcohol use can cause a variety of health and social issues, including cardiovascular diseases, such as alcohol-induced cardiomyopathy (AC). Unlike inherited or other forms of dilated cardiomyopathy (DCM), AC develops as a result of long-term or chronic alcohol use. Both DCM and AC are heart muscle diseases that cause the lower chambers of the heart, the ventricles, to become thinner and grow larger, making it harder for the heart to pump blood throughout the body.^{1,2,3,4} AC is defined using three main criteria:

- 1 Heavy alcohol consumption (>80 grams per day) for at least 5 years;
 - A standard drink contains 10g of alcohol, equivalent to 100mL of wine, 300mL of beer, or 40mL of spirits;*
- 2 Left ventricular end-diastolic diameter >2 standard deviation (SD) above normal and left ventricular ejection fraction (LVEF) <50%;
- 3 Exclusion of other causes of DCM, including hypertensive, valvular, and ischemic heart disease.⁵

Considering all causes, DCM affects 42.8 to 118.3 out of every 100,000 people.⁶ Among people with unexplained DCM, 3.8% to 47% have AC,⁷ and among people with heavy alcohol use, AC is estimated to occur in about 1-2% of individuals.⁸

Clinical Manifestations of AC

The common symptoms of AC include:

- Shortness of breath, particularly with activity or when lying flat;
- Fatigue, weakness and reduced exercise tolerance;
- Peripheral edema or swelling in the legs, ankles or feet (with more advanced disease);
- Irregular or abnormal heart rhythms, which present as palpitations, dizziness, or fainting (atrial fibrillation is most common).

How AC Develops

Heavy alcohol use over time can weaken and damage the heart. Alcohol can directly injure heart muscle cells and make it harder for the heart to pump normally. It can also cause problems with nutrition and important electrolytes in the body that the heart needs to work properly. Some people may be more likely to develop heart damage because of genetics, which may help explain why alcohol affects some people's hearts more than others.

Direct toxic effect of ethanol

Alcohol can directly damage the heart muscle as the body breaks it down into byproducts that injure heart cells. Over time, this damage causes inflammation and stress, making it harder for heart cells to repair themselves and function normally. The heart may weaken, stretch out, and struggle to pump blood to the rest of the body.^{9,10}

* For additional information about standard alcohol drink sizes and guidelines, review this [resource](#) from PCSS-MAUD.

How acetaldehyde damages heart cells

Acetaldehyde is a harmful substance made primarily in the liver when the body breaks down alcohol, and even small amounts can damage cells.¹⁰ Acetaldehyde can damage heart muscle cells and interfere with their ability to produce energy, work properly, and repair themselves. Over time, this damage can weaken the heart and make it harder for the heart to pump blood effectively.¹¹

Nutritional factors**

Alcohol can irritate and damage the gastrointestinal tract, making it harder for the body to absorb important nutrients. Over time, heavy alcohol use can contribute to malnutrition and deficiencies in thiamine (vitamin B1), folate, magnesium, potassium, and phosphate. These deficiencies can worsen muscle function, increase the risk of abnormal heart rhythms, and make it harder for the heart to work effectively.^{12,13}

Nutritional deficiencies may contribute to AC, but alcohol can also damage the heart directly, even when nutrition is adequate.¹⁴ Severe thiamine deficiency can cause beriberi, which may lead to high-output heart failure; this is different from AC, which more commonly involves a weakened and enlarged heart.¹⁵ Historically, cobalt exposure from beer additives was linked to a form of dilated cardiomyopathy known as “Quebec beer drinkers’ cardiomyopathy.”¹⁶

Diagnosing AC



Blood tests: Blood tests help identify signs of heart failure and alcohol-related health problems that may support an AC diagnosis and require treatment. Clinicians look for elevated NT-proBNP, a marker that can suggest heart failure, alongside other markers like liver enzyme abnormalities (ALT/AST), anemia (vitamin B or folate deficiencies), blood volume (MCV), platelet levels, blood smears, blood clotting studies (PT, PTT), cholesterol testing, uric acid, albumin, and electrolytes such as magnesium, potassium, or phosphate.



Electrocardiogram (ECG): An ECG detects rhythm problems like atrial fibrillation, conduction abnormalities, ST or T wave changes, and prolonged QT intervals. These findings can support the AC diagnosis and can highlight electrolyte issues such as low potassium or magnesium levels that need correction.



Echocardiogram: An echocardiogram evaluates heart size and pumping function. For AC, clinicians look for an enlarged left ventricle, reduced left ventricular ejection fraction (LVEF), and other signs that the heart muscle is not squeezing or relaxing properly.¹⁷



Cardiac MRI: A cardiac MRI provides a more detailed picture of heart size, pumping function, and scarring. While MRI cannot confirm AC by itself, clinicians look for low LVEF, enlarged heart chambers or increased heart size, and areas of scarring to help assess the severity of heart muscle damage.

** Review this [PCSS-MAUD resource](#) for more information about common micronutrient deficiencies in patients with AUD.

Treatment of AC

Treatment for AC typically includes a comprehensive strategy that combines lifestyle modifications, treating heart failure and alcohol use disorder (AUD), including behavioral and pharmacologic treatment, managing abnormal heart rhythms, and addressing related health concerns.

Lifestyle modications

Abstinence from alcohol is the preferred treatment goal for people with established AC, because there is no established safe level of alcohol use once the heart muscle has been damaged. However, recovery of LVEF has been seen both in people who stopped drinking completely and in those who substantially reduced their alcohol intake. Continued heavy drinking is associated with poor recovery from AC.¹⁸ In addition to alcohol-related treatment goals, patients may benefit from standard heart-healthy lifestyle changes, including a low-sodium diet, appropriate fluid restriction, regular physical activity when clinically appropriate, and a diet rich in fruits, vegetables, and whole grains.

Pharmacological treatment for AUD

[Medications for alcohol use disorder \(MAUD\)](#), are an important evidence-based treatment approach. FDA-approved options include:

Naltrexone	Acamprosate	Disulfiram
Good first-line option for reducing heavy drinking and cravings if the patient is not taking opioids and has no other contraindications.	Useful when the goal is to maintain abstinence in patients without kidney disease.	Requires extreme caution and should be used in mild AC cases without clear signs of HF, as it is contraindicated in these patients.

Behavioral treatments for AUD

Behavioral supports can also help patients reduce alcohol use or maintain recovery. Options include:

 [Mutual aid/support](#)

 [Digital treatment platforms](#)

 [Recovery groups](#)

 Peer support and recovery coaching

 Cognitive Behavioral Therapy



Pharmacologic treatment for HF

Patients with AC should receive standard treatment for HF with reduced ejection fraction, consistent with current HF guidelines. This often includes beta-blockers, angiotensin receptor–neprilysin inhibitors or ACE inhibitors/angiotensin II receptor blockers, mineralocorticoid receptor antagonists, and sodium–glucose cotransporter-2 inhibitors.^{19,20} Diuretics may also be used to help manage fluid retention.



Management of arrhythmias

Alcohol use can increase the risk of abnormal heart rhythms. Some patients develop supraventricular arrhythmias, such as atrial fibrillation, while heavier alcohol use may also increase the risk of ventricular arrhythmias. Decisions about implantable cardioverter-defibrillators (ICDs) or cardiac resynchronization therapy should follow the same clinical criteria used for other forms of non-ischemic DCM.



Supportive care

Patients with AC may also need care for alcohol-related conditions outside the heart, including liver disease, malnutrition, vitamin deficiencies, and electrolyte imbalances. These concerns often require a multidisciplinary approach. Addressing other cardiovascular risk factors, such as smoking, hypertension, diabetes, and hyperlipidemia, can also improve long-term outcomes.* In rare cases of end-stage AC that does not improve with abstinence and guideline-directed heart failure treatment, heart transplantation may be considered.

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* This [PCSS-MAUD resource](#) discusses additional considerations for patients with comorbid conditions.

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