



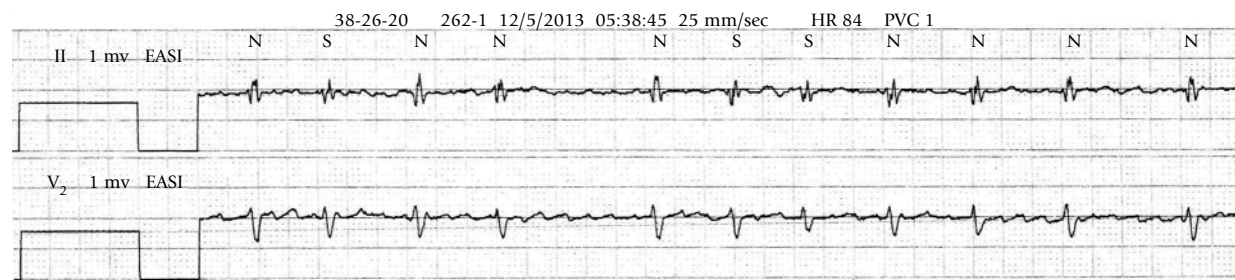
A regular feature of the *American Journal of Critical Care*, the **ECG Puzzler** addresses electrocardiogram (ECG) interpretation for clinical practice. To send an eletter or to contribute to an online discussion about this article, visit [www.ajconline.org](http://www.ajconline.org) and click "Respond to This Article" on either the full-text or PDF view of the article. We welcome letters regarding this feature.

## HOLIDAY HEART SYNDROME

By Mary G. Carey, RN, PhD, CNS, Salah S. Al-Zaiti, RN, PhD, NP, Teri M. Kozik, RN, PhD, CNS, CCRN, and Michele Pelter, RN, PhD

*Scenario:* A 53-year-old male arrived at the mentally ill/chemically addicted unit with acute alcohol withdrawal. His electrocardiogram (ECG) showed the cardiac rhythm below. The patient was a recovering alcoholic but a week earlier had left his family and checked into a motel to drink alcohol. He had stopped eating and had been drinking continuously when he noticed

chest palpitations and shortness of breath the day before Thanksgiving. However, he delayed going to the hospital until after Thanksgiving because he wanted to watch the football games. Before the diagnosis of alcoholism 2 years earlier, the business executive had no medical issues; in fact, he had been very healthy and had run marathons.

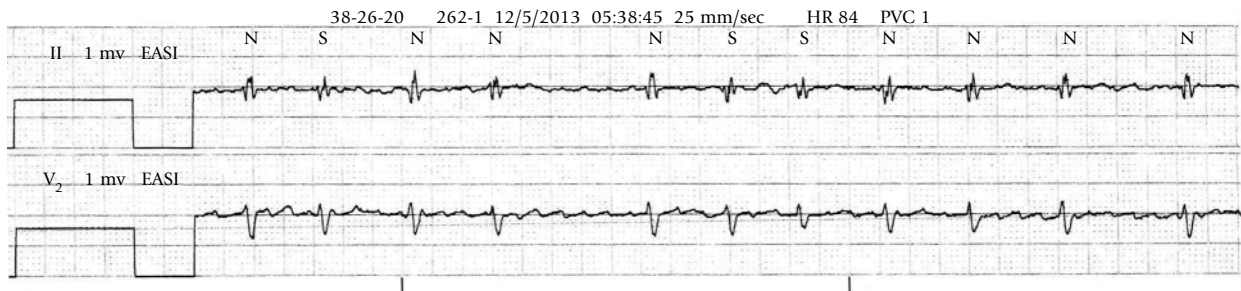


### Interpretation Questions:

1. Is the ECG properly calibrated (10 mm) and are leads properly placed?  Yes  No  NA  
*If no, interpret cautiously.*
2. Is this a sinus rhythm (one P wave preceding every QRS complex)?  Yes  No  NA  
*If no, check for number of P waves in relation to QRS complexes.*
3. Is the heart rate (R-R interval) normal (60-100/min)?  Yes  No  NA  
*If no, check for supraventricular or ventricular arrhythmias.*
4. Is the QRS complex narrow (duration < 110 milliseconds [ms] in V<sub>1</sub>)?  Yes  No  NA  
*If no, check for bundle branch blocks (BBBs), pacing, or ventricular arrhythmia.*
5. Is the ST segment deviated (> 2 mm in V<sub>2</sub>-V<sub>3</sub>, or > 1 mm in other leads)?  Yes  No  NA  
*If yes, check for similar deviations in contiguous cardiac territories.*
6. Is the T wave inverted in relation to the QRS (> 0.5 mV)?  Yes  No  NA  
*If yes, check for ST deviation or conduction abnormalities.*
7. Is the QT interval lengthened (> 450 ms [women] or > 470 ms [men])?  Yes  No  NA  
*If yes, check for ventricular arrhythmias or left ventricular hypertrophy.*
8. Is R- or S-wave amplitude enlarged (S wave V<sub>1</sub> + R wave V<sub>5</sub> > 35 mm)?  Yes  No  NA  
*If yes, check for axis deviation or other chamber hypertrophy criteria.*

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#### Answers:

1. There is a calibration mark at the beginning of the strip.
2. There are no discernable P waves.
3. The heart rate is within the normal rate but irregular.
4. The QRS complex is wide.
5. The ST segments are not deviated.
6. The T waves are not inverted.
7. The QT interval cannot be assessed because the RR interval to correct for heart rate is not stable in the presence of atrial fibrillation.
8. Left ventricular hypertrophy cannot be assessed because leads  $V_1$  and  $V_5$  are not present.

### Interpretation and Rationale

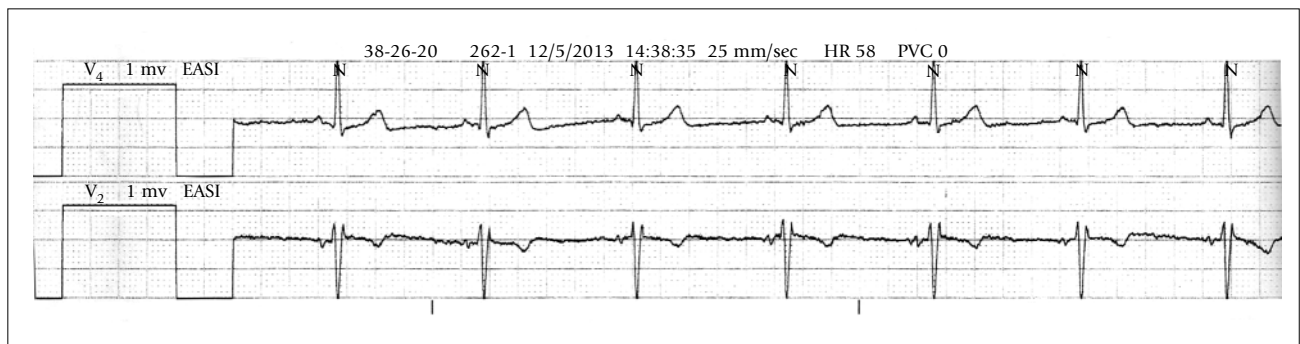
The cardiac rhythm is atrial fibrillation at 84/min. The ECG strip carries an "EASI" label indicating that the monitoring system is using 5 electrodes in a unique configuration to derive continuous 12-lead ECG data. The 2 leads displayed are leads II and  $V_2$ . Alcohol induced atrial arrhythmias, most commonly atrial fibrillation, are also referred to as *holiday heart syndrome*.

Consuming massive quantities of alcohol, especially in the absence of nutrition, results in severe metabolic and electrolyte disturbances. Therefore, before electrical cardioversion was considered, the cardiac team normalized the patient's blood chemistry to provide the opportunity for spontaneous conversion to normal sinus rhythm.

### Management

Treatment included intravenous diltiazem, which controlled the ventricular rate. However, the arrhythmia failed to spontaneously convert after 4 days of alcohol detoxification therapy. A transesophageal echocardiogram revealed no apical mural thrombi, so a synchronized cardioversion shock was delivered without complication resulting in successful conversion to sinus rhythm (see ECG strip below).

Overall, there are fewer complications from atrial fibrillation among alcoholic patients than among non-alcoholics, and most (90%) convert spontaneously to a normal sinus rhythm with proper medical management. A careful clinical history, to include alcohol use and misuse, should be considered early as the differential diagnosis of new-onset atrial fibrillation in younger patients.



**After Cardioversion:** Normal sinus rhythm at 58/min (leads displayed are  $V_4$  and  $V_2$ ).

## **Holiday Heart Syndrome**

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