ECG Underwriting Puzzler

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Obtaining Best Results from this presentation

For best results—please do the following:
• Select “Slide Show” from the menu option on top

- Select “From the beginning”

- Slowly click through the presentation
- Have fun!---Good luck
What is the major abnormality on this ECG?
After inspecting for technical issues let’s examine the ECG using our usual routine:

1) Rhythm 2) Axis 3) Intervals 4) Q waves 5) Hypertrophy 6) ST/T waves

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technically, any issues?</td>
<td>No</td>
</tr>
<tr>
<td>Normal rhythm?</td>
<td>Yes, normal sinus rhythm</td>
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<tr>
<td>Normal Axis?</td>
<td>Yes</td>
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<tr>
<td>Normal Intervals?</td>
<td>No. The PR interval is prolonged. (see last issue’s discussion) The QRS interval is also prolonged at &gt;0.12 sec</td>
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<tr>
<td>Significant Q waves?</td>
<td>No</td>
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<tr>
<td>Hypertrophy?</td>
<td>No</td>
</tr>
<tr>
<td>ST/T wave abnormalities?</td>
<td>Yes, there are ST segment depression findings as well as T wave inversions.</td>
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</tbody>
</table>
### Analyzing intervals—steps to success

#### Step 1
- Determine the PR interval
  - **Clue:** Any lead can be checked but frequently lead II has the highest p waves
  - Normally 0.12 to 0.20 seconds, it is impacted by heart rate
  - Short intervals can signify the presence of pre-excitation syndromes
  - Long intervals can signify the presence of AV blocks

#### Step 2
- Determine the QRS interval
  - **Clue:** Look at V1-2 and V5-6
  - The normal QRS interval is 0.06 to 0.10 seconds and is not impacted by rate
  - Long QRS intervals suggest bundle branch blocks, pre-excitation syndromes, ventricular pacing or Ventricular tachycardia

#### Step 3
- Determine the QT interval
  - **Clue:** Use the lead that has the clearest ending to the T wave. If it is <2 big boxes it is typically WNL as long as the heart rate is normal
  - Measure from the onset of the QRS to the end of the T wave
  - Measure 3-5 consecutive beats and then average
  - QT intervals vary based upon the lead being evaluated and by heart rate
  - Most normal ranges use lead II
  - V2-3 typically have the longest QT interval however and is frequently used
  - Use the QT interval calculation for equivocal findings
ECG Puzzler

Measure the PR interval.

I believe you will find it to be prolonged—measures out to be ~ 0.24 sec.

Measure the QRS interval. It looks prolonged too!!

~0.14 seconds

Prolonged indeed!!! Once again this issue, we have a prolonged interval.
In adults think of LBBB when:

- QRS ≥ 0.12 sec
- There are broad monomorphic R waves in I, V5 and V6 with no q waves
- Delayed onset of intrinsicoid deflection (R peak time) V5 and V6

When all of these criteria are met…we have LBBB
Interesting and important facts regarding LBBB
LBBB causes diagnostic problems with several conditions
- Myocardial Ischemia
- Myocardial Infarction
- Ventricular Hypertrophy

• Exercise induced LBBB is predictive of higher rates of cardiac events and mortality
• The prognosis is dependent on the underlying cardiac condition
• In asymptomatic younger individuals it might not be associated with increased mortality but in older individuals the same cannot be said.
• Cannot interpret a stress test with this condition—The depressed ST segments and inverted T waves are characteristic of LBBB and do not necessarily indicate ischemia, although it may be present.

This concludes this issue’s ECG Puzzler. Contact me if you have questions!