Lake EMS Basic EKG Review: Dreaded Heart Blocks

The Lake EMS Quality Development Team
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Use of this program is limited to training and Quality Education only

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This program

- In this program we will review the basic components of heart block rhythms
  - Then we’ll demonstrate a way to assess a heart block and to accurately identify it, easily!
Our disclaimer opinion

- With respect to the many revered instructors and authors who teach electrocardiology rhythm assessment, there are many differences in opinion regarding things such as heart rates for rhythms.
  - So we defined our own parameters with the blessings of the Lake County Medical Director, Pushpal R. Banerjee, D.O.
Our solution

- Consequently, our Basic EKG Online review meets the criteria as set forth by our Quality Development Department:
  - **John Simpson**, Chief Operations Officer
  - **Michael R. (Mike) Hilliard**, Non-Clinical/Non-Quality Training Officer
  - **Jamie A. Lowery**, District Chief, Field Training Coordinator
  - **Scott Temple**, Clinical Training Officer
  - **Julie Treadwell**, Clinical Quality Officer

- And our Medical Director:
  - **Pushpal R. (Paul) Banerjee**, D.O.
Basic wave breakdown

- Please understand this is an interpretation review, not a diagnostic patient assessment
- Always treat the patient and not the monitor
  - P-wave: Atrial depolarization
  - QRS-complex: Ventricular depolarization
  - T-wave: Ventricular repolarization
1st Axiom of EMS

- And if you forget to treat the patient and are considering treating the monitor, remember the first axiom of EMS:
1st Axiom of EMS

- And if you forget to treat the patient and are considering treating the monitor, remember the first axiom of EMS:
  - If you’re not sure what to do,
And if you forget to treat the patient and are considering treating the monitor, remember the first axiom of EMS:

- If you’re not sure what to do, ask your EMT what the other paramedics would do in a similar situation.
“Hey, that looks like…”

- Many of us were taught how to visually recognize EKGs
- We were taught a simple process of 5-steps that help define the rhythm characteristics; however, over time we returned to the visual recognition
For rhythm assessment review

- Please complete the Lake EMS Online Review: Basic EKG Review, Atrial Rhythms
- Before we begin, we’ll perform a short review of the Atrioventricular (AV) Node and the PR Interval
Normal Impulse Conduction

AV Node

Sinus Node

AV Node

Bundle Of His

Right Bundle Branch

Left Bundle Branch

Purkinje fibers
Normal Impulse Conduction

AV Node
Atrioventricular (AV) Node delays (holds) electrical impulse
Normal Impulse Conduction

AV Node
Allows ventricles to fill with blood from atria (two bottom chambers of the heart)
Impulse Conduction & the EKG

Sinoatrial node

AV node

PR

P
The PR Interval

Atrial depolarization + delay in AV node

- Delay allows time for atria to empty completely before the ventricles contract
Mini-review

- Let us take a moment to review the normal assessment criteria of Normal Sinus Rhythm
Normal Sinus Rhythm

- NSR is the normal rhythm produced when the SA node initiates the cardiac electrical impulse
- It is what we compare most rhythms against
Normal Sinus Rhythm

1. Rate: 60 – 99, on average
2. Rhythm: Regular
3. P-waves: Normal
4. PRI: Normal
5. QRS: Narrow
Normal Sinus Rhythm
Normal Sinus Rhythm

- In reviewing the steps of an EKG, we will repeat the 5-Part EKG Assessment components
5-Part EKG Assessment

1. **Rate:**
   - QRS in 6-second strip, multiply x 10

2. **Rhythm:**
   - QRS distances consistent throughout strip

3. **P-waves:** *(in the entire strip being assessed):*
   - Are P-waves present?
   - Do they look like a small rounded hill?
   - Is there a P for every QRS?
   - Is there a QRS for every P?
   - Does each P looks like all the others?
   - Is each P the same distance from the QRS?

4. **P to R Interval (PRI):**
   - 0.12 to 0.20 seconds

5. **QRS-Complexes:**
   - Narrow: <0.12-seconds (3 small boxes)
   - Wide: >0.12-seconds
5-Part EKG Assessment

1. Rate:
   - What is the rate?
5-Part EKG Assessment

1. Rate:
   ■ 80-bpm
5-Part EKG Assessment

2. Rhythm:
   - Is the rhythm regular or irregular?
5-Part EKG Assessment

2. Rhythm:
   ■ Regular
5-Part EKG Assessment

3. P-waves:
- Are P-waves present?
- Do they look like a small rounded hill?
- Is there a P for every QRS?
- Is there a QRS for every P?
- Does each P looks like all the others?
- Is each P the same distance from the QRS?
5-Part EKG Assessment

3. P-waves:
- P-waves? Yes
- Look like rounded hill? Yes
- P for every QRS? Yes
- QRS for every P? Yes
- P looks like each other? Yes
- P same distance from the QRS? Yes
5-Part EKG Assessment

4. P to R Interval (PRI):
   - Is the PRI between 3-5 small boxes?
5-Part EKG Assessment

4. P to R Interval (PRI):

- Yes, 0.20-seconds
Part 4: PRI
(not Public Radio International)

- P to R Interval (PRI):
  - 0.12 to 0.20 seconds
  - (3-5 small boxes)
Part 4: PRI
(not Public Radio International)

- P to R Interval (PRI):
  - 0.12 to 0.20 seconds
  - (3-5 small boxes)

- The PRI is a window into the effectiveness of the AV Node
Part 4: PRI
*(not Public Radio International)*

- **P to R Interval (PRI):**
  - 0.12 to 0.20 seconds
  - (3-5 small boxes)

- The PRI is a window into the effectiveness of the AV Node
  - AV Node has the duty to delay the atrial impulse to allow for better ventricular filling
5-Part EKG Assessment

5. QRS-Complexes:
   ■ Is QRS narrow or wide?
5-Part EKG Assessment

5. QRS-Complexes:
   - Narrow, 0.08-seconds
This is Normal Sinus Rhythm

1. Rate:  □ 80
2. Rhythm: □ Regular
3. P-waves: □ Normal
4. PRI: □ Normal
5. QRS: □ Narrow
And now...

- For something completely different
Ladies and Gentlemen...
Ladies and Gentlemen…

Heart Blocks
Ladies and Gentlemen…

Heart Blocks (yuck)
The heart block challenge

- For decades I have taught Advanced Cardiac Life Support (ACLS) Provider, Refresher, and Instructor Candidate courses to pre-hospital and in-hospital medical personnel
AHA Training Centers/Training Sites often have participants take a pre-requisite EKG rhythm recognition exam to demonstrate their ability to accurately recognize and identify these core rhythms before entering an ACLS class.
Start the dreading

- So the two (2) dreaded questions that we hear from students before they take an EKG test are...
Dreaded Heart Blocks

1. How many questions can I get wrong and still pass? And,
Dreaded Heart Blocks

1. How many questions can I get wrong and still pass? And,
2. How many Heart Blocks are there on the test?
Dreaded Heart Blocks

1. How many questions can I get wrong and still pass? And,
2. How many Heart Blocks are there on the test?

- They are hoping both answers are the same
This program

- In this program we will review the basic components of heart block rhythms
  - Then we’ll demonstrate a way to assess a heart block and to accurately identify it, easily!
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- At times you will hear the term AV (Atrioventricular) and heart blocks
This program

- In this program we will review the basic components of heart block rhythms
  - Then we’ll demonstrate a way to assess a heart block and to accurately identify it, easily!

- At times you will hear the term AV (Atrioventricular) and heart blocks
  - For the purposes of this program they are interchangeable
First Degree Heart Block

- 1\textsuperscript{st} degree heart block is simply a delay in passage of the impulse
  - This delay usually occurs at the level of the AV node
- 1\textsuperscript{st} degree heart blocks are characterized by PR intervals longer than 0.20 second
1st degree heart block

1. Rate: □ 40-100
2. Rhythm: □ Regular
3. P-waves: □ Normal
4. PRI: □ This interval is prolonged
5. QRS: □ Narrow
5-Part EKG Assessment

1. Rate:
   ■ What is the rate?
5-Part EKG Assessment

1. Rate:
   - 60-bpm
5-Part EKG Assessment

2. Rhythm:
   - Is the rhythm regular or irregular?
2. Rhythm:

- Regular
5-Part EKG Assessment

3. P-waves:

- Are P-waves present?
- Do they look like a small rounded hill?
- Is there a P for every QRS?

- Is there a QRS for every P?
- Does each P looks like all the others?
- Is each P the same distance from the QRS?
5-Part EKG Assessment

3. P-waves:
- P-waves? Yes
- Look like rounded hill? Yes
- P for every QRS? Yes
- QRS for every P? Yes
- P looks like each other? Yes
- P same distance from the QRS? Yes
5-Part EKG Assessment

4. P to R Interval (PRI):
   - Is the PRI between 3-5 small boxes?
5-Part EKG Assessment

4. P to R Interval (PRI):
   - No, 7.5 small boxes; 0.30-seconds
5-Part EKG Assessment

5. QRS-Complexes:
   - Is QRS narrow or wide?
5-Part EKG Assessment

5. QRS-Complexes:
   - Narrow, 0.08-seconds
This is 1st degree heart block

1. Rate: □ 60
2. Rhythm: □ Regular
3. P-waves: □ Normal
4. PRI: □ Prolonged
5. QRS: □ Narrow
Occasionally…

- We hear of paramedics saying that they have a borderline 1st degree heart block
Occasionally,…

- We hear of paramedics saying that they have a borderline 1st degree heart block
- 1st degree heart block is or it isn’t; there is no borderline
Also,…

- Please remember that 1st degree heart block is a rhythm category in and of itself
Also,…

- Please remember that 1st degree heart block is a rhythm category in and of itself
- It is not a normal sinus rhythm with a 1st degree heart block
Also,…

- Please remember that 1<sup>st</sup> degree heart block is a rhythm category in and of itself
- It is not a normal sinus rhythm with a 1<sup>st</sup> degree heart block
  - (You don’t call 3<sup>rd</sup> degree heart block a idioventricular rhythm with disassociated P-waves, do you?)
If you want to describe the severity of the rhythm remember it is not the rhythm that presents itself, it is the patient.
Documentation

- If you want to describe the severity of the rhythm remember it is not the rhythm that presents itself, it is the patient.

- Quantifiers that can be used are:
  - Patient has chest pain
  - Heart rate of 30-bpm
  - BP is 62/P
Second degree heart block, Mobitz type I (Wenckebach)

- 2nd degree heart block, Mobitz type I, is characterized by a progressive prolongation of the PR interval
  - This means the PRI becomes longer complex to complex
- Then a single impulse is blocked, and the pattern is repeated
Second degree heart block, Mobitz type I (Wenckebach)

- 2\(^{nd}\) degree heart block, Mobitz type I, is characterized by a progressive prolongation of the PR interval
  - This means the PRI becomes longer complex to complex

- Then a single impulse is blocked, and the pattern is repeated
  - Key word: pattern
Blocking

- By the complex being blocked we mean that an impulse is held by the AV Node until it is unable to continue to carry the electricity into the ventricles
  - What we see is a P-wave with no corresponding QRS
Karel Frederick Wenckebach, MD

- First identified the rhythm and it was subsequently named for him
- It is also called 2nd degree heart block, Mobitz type I
  - For a synopsis on Dr. Wenckebach, please read: http://circ.ahajournals.org/cgi/reprint/113/25/f97.pdf
### 2nd degree heart block, Mobitz type I

1. **Rate:**
   - Ventricular < atrial rate

2. **Rhythm:**
   - Irregular

3. **P-waves:**
   - Has blocked P-wave
     - > 1 P to QRS

4. **PRI:**
   - Progressive increase in PR interval until P-wave is blocked

5. **QRS:**
   - Narrow
5-Part EKG Assessment

1. Rate:
   - What is the rate?
5-Part EKG Assessment

1. Rate:
   - 60-bpm
5-Part EKG Assessment

2. Rhythm:
   - Is the rhythm regular or irregular?
5-Part EKG Assessment

2. Rhythm:

- Irregular
5-Part EKG Assessment

3. P-waves:
- Are P-waves present?
- Do they look like a small rounded hill?
- Is there a P for every QRS?
- Is there a QRS for every P?
- Does each P looks like all the others?
- Is each P the same distance from the QRS?
5-Part EKG Assessment

3. P-waves:
   - P-waves?
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
5-Part EKG Assessment

3. P-waves:

- P-waves? Yes
- Look like rounded hill?
3. P-waves:

- P-waves? Yes
- Look like rounded hill? Yes
5-Part EKG Assessment

3. P-waves:

- P-waves? **Yes**
- Look like rounded hill? **Yes**
- P for every QRS?
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS? Yes
5-Part EKG Assessment

3. P-waves:
   - P-waves? **Yes**
   - Look like rounded hill? **Yes**
   - P for every QRS? **Yes**
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS? Yes

Yes? You betcha!
5-Part EKG Assessment

3. P-waves:
   - P-waves? **Yes**
   - Look like rounded hill? **Yes**
   - P for every QRS? **Yes**
   - Yes? You betcha!
   - Every QRS does have a P-wave; however,...
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS? Yes
   - QRS for every P?
5-Part EKG Assessment

3. P-waves:
- P-waves? Yes
- Look like rounded hill? Yes
- P for every QRS? Yes
- QRS for every P? No
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS? Yes

- QRS for every P? No
- P looks like each other?
3. P-waves:
   - P-waves? **Yes**
   - Look like rounded hill? **Yes**
   - P for every QRS? **Yes**

4. QRS for every P? **No**
   - P looks like each other? **Yes**
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS? Yes

   - QRS for every P? No
   - P looks like each other? Yes
   - P same distance from the QRS?
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS? Yes

   - QRS for every P? No
   - P looks like each other? Yes
   - P same distance from the QRS? No
5-Part EKG Assessment

4. P to R Interval (PRI):
   - Is the PRI between 3-5 small boxes?
5-Part EKG Assessment

4. P to R Interval (PRI):
   - No, varies in length
5-Part EKG Assessment

5. QRS-Complexes:
   - Is QRS narrow or wide?
5-Part EKG Assessment

5. QRS-Complexes:
   ■ Narrow, 0.08-seconds
This is 2nd degree heart block, Mobitz type I

1. Rate:  □ 60
2. Rhythm:  □ Irregular
3. P-waves:  □ Too many P-waves to QRSs
4. PRI:  □ Varies
5. QRS:  □ Narrow
Second degree heart block, Mobitz type II

- A hallmark of this type of 2\textsuperscript{nd} degree heart block, Mobitz type II, is that the PR interval does not lengthen before a dropped beat.
# Second degree heart block, Mobitz type II

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<thead>
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<tbody>
<tr>
<td>1. Rate:</td>
<td></td>
<td>○ Ventricular is $&lt;$ atrial rate</td>
</tr>
<tr>
<td>2. Rhythm:</td>
<td></td>
<td>○ Regular or irregular</td>
</tr>
</tbody>
</table>
| 3. P-waves: |   | ○ Has blocked P-wave  
  ■ $>$ 1 P to QRS |
| 4. PRI: |   | ○ Constantly normal or prolonged |
| 5. QRS: |   | ○ Narrow or wide |
5-Part EKG Assessment

1. Rate:
   - What is the rate?
5-Part EKG Assessment

1. Rate:
   - 50-bpm
5-Part EKG Assessment

2. Rhythm:
   - Is the rhythm regular or irregular?
5-Part EKG Assessment

2. Rhythm:
   - Irregular
5-Part EKG Assessment

3. P-waves:
   - Are P-waves present?
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill?
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS?
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS? Yes
5-Part EKG Assessment

3. P-waves:

- P-waves? **Yes**
- Look like rounded hill? **Yes**
- P for every QRS? **Yes**
5-Part EKG Assessment

3. P-waves:

- P-waves? Yes
- Look like rounded hill? Yes
- P for every QRS? Yes
- QRS for every P? No
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS? Yes
   - QRS for every P? No
   - P looks like each other?
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS? Yes

   - QRS for every P? No
   - P looks like each other? Yes
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS? Yes

   - QRS for every P? No
   - P looks like each other? Yes
   - P same distance from the QRS?
5-Part EKG Assessment

3. P-waves:

- P-waves? **Yes**
- Look like rounded hill? **Yes**
- P for every QRS? **Yes**

- QRS for every P? **No**
- P looks like each other? **Yes**
- P same distance from the QRS? **Yes**
5-Part EKG Assessment

3. P-waves:

- P same distance from the QRS? **Yes**
- We only measure the P-waves with a corresponding QRS-wave
5-Part EKG Assessment

3. P-waves:
   - Sometimes you can actually see them wave
5-Part EKG Assessment

4. P to R Interval (PRI):
   - Is the PRI between 3-5 small boxes?
5-Part EKG Assessment

4. P to R Interval (PRI):
   - Yes, 0.20-seconds
Yes?

- Is that correct? Is the PRI normal?
Yes?

- Is that correct? Is the PRI normal?

- Indeed it is
5-Part EKG Assessment

4. P to R Interval (PRI):
   - Yes, every PRI is the same
5-Part EKG Assessment

4. P to R Interval (PRI):

- These P-waves have no QRS and thereby no PRI
- **Must** have P and QRS waves
5-Part EKG Assessment

5. QRS-Complexes:
   - Is QRS narrow or wide?
5-Part EKG Assessment

5. QRS-Complexes:
   - Narrow, 0.08-seconds
This is 2\textsuperscript{nd} degree heart block, Mobitz type II

1. Rate: \quad \square 50
2. Rhythm: \quad \square Irregular
3. P-waves: \quad \square Too many P-waves to QRSs
4. PRI: \quad \square Normal
5. QRS: \quad \square Narrow
Third degree heart block/complete heart block

- 3rd degree heart block indicates complete absence of conduction between atria and ventricles
- 3rd degree heart block is characterized by a complete dissociation between P waves and QRS complexes
Third degree heart block/complete heart block

- Both terms are acceptable:
  - 3rd degree heart block
  - Complete Heart Block
The heart

- The ventricles do not receive any innervations from the atrium
- Subsequently, the ventricles must begin to fire as they have the ability to create their own impulse
  - AKA automaticity
Automaticity and Inherent Myocardial Cell Firings

- Remember the initiated heart rate from the ventricles is a back-up system; it is here to keep us alive:
  - SA Node: 60-150 bpm (Not working)
  - AV Junction: 40-60 bpm (Not choosing to work)
  - Ventricles: 30-40 bpm

  - These are normal values, other rates can and do occur at times
3rd degree heart block

1. Rate: Ventricular < atrial rate
2. Rhythm: Regular
3. P-waves: Has blocked P-wave(s)
   - > 1 P to QRS
4. PRI: No association
5. QRS: Wide, but occasionally narrow
5-Part EKG Assessment

1. Rate:
   - What is the rate?
5-Part EKG Assessment

1. Rate:
   - 30-bpm
5-Part EKG Assessment

2. Rhythm:
   - Is the rhythm regular or irregular?
5-Part EKG Assessment

2. Rhythm:
   - Regular
5-Part EKG Assessment

3. P-waves:
- Are P-waves present?
- Do they look like a small rounded hill?
- Is there a P for every QRS?

- Is there a QRS for every P?
- Does each P look like all the others?
- Is each P the same distance from the QRS?
5-Part EKG Assessment

3. P-waves:
   - P-waves?
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill?
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
5-Part EKG Assessment

3. P-waves:
   - P-waves? **Yes**
   - Look like rounded hill? **Yes**
   - P for every QRS?
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS? Yes
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS? Yes
   - QRS for every P?
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS? Yes
   - QRS for every P? No
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS? Yes

   - QRS for every P? No
   - P looks like each other?
5-Part EKG Assessment

3. P-waves:
- P-waves? Yes
- Look like rounded hill? Yes
- P for every QRS? Yes

- QRS for every P? No
- P looks like each other? Yes
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS? Yes

   - QRS for every P? No
   - P looks like each other? Yes
   - P same distance from the QRS?
5-Part EKG Assessment

3. P-waves:
   - P-waves? Yes
   - Look like rounded hill? Yes
   - P for every QRS? Yes
   - QRS for every P? No
   - P looks like each other? Yes
   - P same distance from the QRS? No
5-Part EKG Assessment

4. P to R Interval (PRI):
   - Is the PRI between 3-5 small boxes?
5-Part EKG Assessment

4. P to R Interval (PRI):
   - No, varies
PRI

- The PRI is a window into the effectiveness of the AV Node
  - AV Node has the duty to delay the atrial impulse to allow for better ventricular filling
5-Part EKG Assessment

5. QRS-Complexes:
   - Is QRS narrow or wide?
5-Part EKG Assessment

5. QRS-Complexes:

- Wide, nearly 0.20-seconds
5-Part EKG Assessment

5. QRS-Complexes:

- Wide, nearly 0.20-seconds
  - What a normal PRI should look like
This is 3\textsuperscript{rd} degree heart block

1. Rate: \[ \square \ 30 \]
2. Rhythm: \[ \square \ Regular \]
3. P-waves: \[ \square \ No QRS for each P-wave \]
4. PRI: \[ \square \ Varies \]
5. QRS: \[ \square \ Wide \]
Dreaded Heart Blocks

- From my testing experiences, most people can identify that the rhythm is a heart block
  - What they cannot accurately and consistently do is to correctly identify which of the 2nd or the 3rd degree heart block it is

- Now we’ll demonstrate a way to assess a heart block and to accurately identify it, easily!
On page 65 of the 2nd Edition, Textbook of Advanced Cardiac Life Support, it offers the greatest algorithm for differentiating 2nd and 3rd degree heart block

- Now some of you may not have a readily available copy of your 1987 textbook so feel free to make an appointment with me and you can see my copy
2 Step Heart Block Analysis

More P’s than QRSs

PRI same in all complexes?

yes

2nd degree Heart Block, Mobitz II

no

QRSs regular?

yes

3rd degree Heart Block

no

2nd degree Heart Block, Mobitz I (Wenckebach)
Another way to view
(If there are more P’s than QRSs)

Is the PRI the same in all complexes?

If Yes, then it’s:
2\textsuperscript{nd} degree heart block, Mobitz type II

If No, then ask:
Is the rhythm regular?

If Yes, then it’s:
3\textsuperscript{rd} degree heart block

If No, then it’s:
2\textsuperscript{nd} degree heart block, Mobitz type I
This is an example of what people look like after learning this process
Practice time
Practice time

And the crowd goes crazy
Practice time

And the crowd goes crazy, -ish
5-Part EKG Assessment

1. Rate
2. Rhythm
3. P-waves
4. P to R Interval (PRI)
5. QRS-Complexes

- To the left are the 5-steps for assessing a rhythm
5-Part EKG Assessment

1. Rate
2. Rhythm
3. P-waves
   ■ Is there a QRS for every P?
4.
5.

- To the left are the 5-steps for assessing a rhythm
- When we get to the part that asks if there is a QRS for every P and we answer no,
5-Part EKG Assessment

1. Rate
2. Rhythm
3. P-waves
   - Is there a QRS for every P?
4. 
5. 

- To the left are the 5-steps for assessing a rhythm
- When we get to the part that asks if there is a QRS for every P and we answer no, then we know we have a second or third degree heart block
5-Part EKG Assessment

1. Rate
2. Rhythm
3. P-waves
   - Is there a QRS for every P?
4. 
5. 

- To the left are the 5-steps for assessing a rhythm
- When we get to the part that asks if there is a QRS for every P and we answer no, then we know we have a second or third degree heart block
- And we do not need to assess further
5-Part EKG Assessment

1. Rate
2. Rhythm
3. P-waves
   - Is there a QRS for every P?
4. 
5. 

- Is the PRI the same in all complexes?
  - If Yes, then it’s: 2\textsuperscript{nd} degree heart block, Mobitz type II
  - If No, then ask: Is the rhythm regular?
    - If Yes, then it’s: 3\textsuperscript{rd} degree heart block
    - If No, then it’s: 2\textsuperscript{nd} degree heart block, Mobitz type I
Sample rhythms

- Let's give it a try
Sample rhythms

- Lets give it a try
- Remember, we are looking for the sign of more than one P-wave to a QRS-wave
What is it? Number 1
If there are more P’s than QRSs

Is the PRI the same in all complexes?

If Yes, then it’s:
2nd degree heart block, Mobitz type II

If No, then ask:
Is the rhythm regular?

If Yes, then it’s:
3rd degree heart block

If No, then it’s:
2nd degree heart block, Mobitz type I
What is it? Number 1

- Is the PRI the same in all complexes?
What is it? Number 1

- Is the PRI the same in all complexes?
  - No
What is it? Number 1

- Is the PRI the same in all complexes?
  - No
- Is the rhythm regular?
What is it? Number 1

- Is the PRI the same in all complexes?
  - No
- Is the rhythm regular?
  - No
What is it? Number 1

- Is the PRI the same in all complexes?
  - No

- Is the rhythm regular?
  - No: 2nd degree heart block, Mobitz type I
What is it? Number 2
What is it? Number 2

- Is the PRI the same in all complexes?
What is it? Number 2

- Is the PRI the same in all complexes?
  - Yes: 2 degree Heart Block, Mobitz Type II
What is it? Number 2

- Is the PRI the same in all complexes?
  - Yes: 2 degree Heart Block, Mobitz Type II
- Looks like 3rd degree heart block but it is not
What is it? Number 2

- Is the PRI the same in all complexes?
  - Yes: 2 degree Heart Block, Mobitz Type II
- Looks like 3rd degree heart block but it is not
- This is why we have such great success using the algorithm

![ECG Image]
What is it? Number 3
What is it? Number 3

- Is the PRI the same in all complexes?
What is it? Number 3

- Is the PRI the same in all complexes?
- Does it matter?
What is it? Number 3

- Is the PRI the same in all complexes?
- Does it matter? Nope
What is it? Number 3

- Is the PRI the same in all complexes?
- Does it matter? Nope, because those are not P-waves
What is it? Number 3

- Is the PRI the same in all complexes?
- Does it matter? Nope, because those are not P-waves
- They are F-waves also known as Flutter waves
What is it? Number 3

- Is the PRI the same in all complexes?
- Does it matter? Nope, because those are not P-waves
- They are F-waves also known as Flutter waves
- This is Atrial Flutter
What is it? Number 4
What is it? Number 4

- Is the PRI the same in all complexes?
What is it? Number 4

- Is the PRI the same in all complexes?
  - No
What is it? Number 4

- Is the PRI the same in all complexes? No
- Is the rhythm regular?
What is it? Number 4

- Is the PRI the same in all complexes? No
- Is the rhythm regular?
  - Yes: 3rd degree heart block
What is it? Number 5
What is it? Number 5

- Is the PRI the same in all complexes?
What is it? Number 5

- Is the PRI the same in all complexes?
  - Yes
What is it? Number 5

- Is the PRI the same in all complexes?
  - Yes: 2 degree Heart Block, Mobitz Type II
What is it? Number 6
What is it? Number 6

- Is the PRI the same in all complexes?
What is it? Number 6

- Is the PRI the same in all complexes?
  - No
What is it? Number 6

- Is the PRI the same in all complexes? **No**
- Is the rhythm regular?
What is it? Number 6

- Is the PRI the same in all complexes? No
- Is the rhythm regular? Yes
What is it? Number 6

- Is the PRI the same in all complexes? **No**
- Is the rhythm regular?
  - Yes: **3rd degree heart block**
What is it? Number 7
What is it? Number 7

- Is the PRI the same in all complexes?
What is it? Number 7

- Is the PRI the same in all complexes?
  - No
What is it? Number 7

- Is the PRI the same in all complexes?
  - No
- Is the rhythm regular?
What is it? Number 7

- Is the PRI the same in all complexes?
  - No
- Is the rhythm regular?
  - No
What is it? Number 7

- Is the PRI the same in all complexes?
  - No
- Is the rhythm regular?
  - No: 2nd degree Heart Block, Mobitz Type I
What is it? Number 8
What is it? Number 8

- First off, is there more than one P-wave to a QRS?
What is it? Number 8

- First off, is there more than one P-wave to a QRS?
- Take your time
What is it? Number 8

- First off, is there more than one P-wave to a QRS?
- Take your time
- You can do it
What is it? Number 8

- So yes, this is a heart block
What is it? Number 8

- Is the PRI the same in all complexes?
What is it? Number 8

- Is the PRI the same in all complexes?
  - No
What is it? Number 8

- Is the PRI the same in all complexes?
  - No
- Is the rhythm regular?
What is it? Number 8

- Is the PRI the same in all complexes?
  - No

- Is the rhythm regular?
  - Hard to tell but it was, which leads us to identify the rhythm as…
What is it? Number 8

- Is the PRI the same in all complexes?
  - No

- Is the rhythm regular?
  - Yes: 3\textsuperscript{rd} degree heart block
Background story

1985
Background story

- **1985**
  - Feel free **not** to shout out, “Hey, that was before I was born!”
Background story

- 1985
  - Feel free **not** to shout out, “Hey, that was before I was born!”
- Elderly patient with 2\textsuperscript{nd} degree heart block, Mobitz type II, slow heart rate and very symptomatic
Background story

- My great partner, Shawn Metayer, and I administered 0.5-mg Atropine
Background story

- My great partner, Shawn Metayer, and I administered 0.5-mg Atropine
  - TCP did not exist in EMS at that time
Background story

- My great partner, Shawn Metayer, and I administered 0.5-mg Atropine
  - TCP did not exist in EMS at that time
- Atropine at that time was not contraindicated in late stage Heart Blocks by the American Heart Association
Background story

- Did the Atropine work?
Did the Atropine work?

YES!
Background story

- Did the Atropine work?

  YES!

- Atropine is an vasolytic and allows the SA Node to fire more
Background story

- Did the Atropine work?
- 140 Atrial rate
Background story

- Did the Atropine work?
- 140 Atrial rate, albeit a 0-ventricular rate
Background story

- Did the Atropine work?
- 140 Atrial rate, albeit a 0-ventricular rate
- The patient remained conscious the entire time

A six (6) second strip
Background story

- Despite our best efforts, the patient survived
Background story

- Despite our best efforts, the patient survived
- In all reality, we were providing the best care we could at that time
This is the end

- Stay tuned for the last installment of Basic EKG Review:
  - Ventricular Rhythms
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Lake EMS Basic EKG Review: Dreaded Heart Blocks

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