Common Bradycardias and Device Implantation

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Basic Overview of Devices

- *Single Chamber Pacemakers*
- *Dual Chamber Pacemakers*
- *Single Chamber ICDs*
- *Dual Chamber ICDs*
- *Biventricular Pacers/ICDs*

Single Chamber Pacers

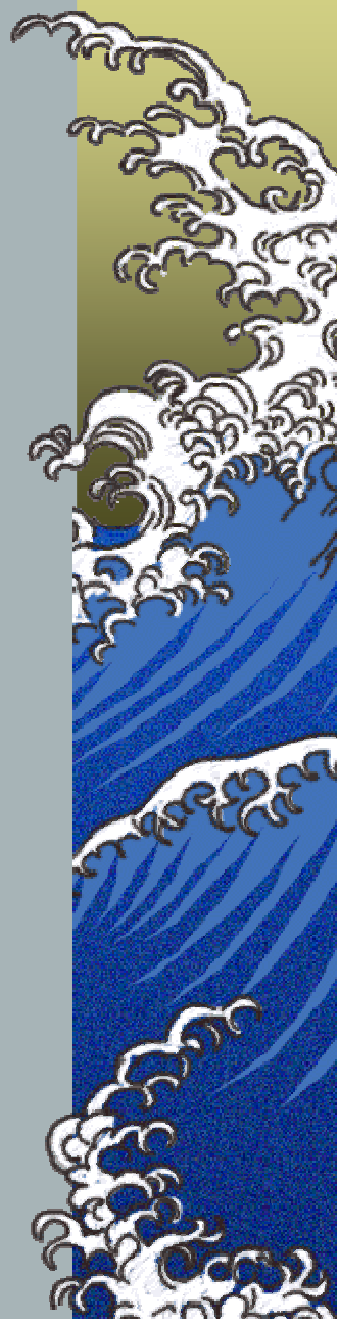
- *Permanent*
  - *Will review a variety of indications*
- *Don't Forget:*
  - *Temporary pacers put in by cardiology*
  - *Some post-CABG devices*

Indications:Single Chamber Pacers

- *Symptomatic 2nd deg AV block or sinus node dysfunction*
  - *in debilitated patients not expected to benefit from atrial tracking*
- *Persistent Afib with slow ventricular resp*
- *Prophylaxis in sick sinus syndrome / sinus pauses when not often pacer dependent*

Indications: Dual Chamber Pacers

- *Sinus node dysfunction*
  - *>3s pauses awake*
  - *Chronotropic incompetence*
- *Symptomatic type 2 2nd degree AV block*
- *Complete AV block v rate<40 or symptoms*
- *Persistent post-bypass AVB*
- *Paroxysmal AF with 2nd or > deg AV block*
- *2nd degree AVB with a wide QRS*
- *Obstructive Sleep Apnea*



Indications: ICDs

- *NYHA Class II-III CHF with EF<35%*
  - *Ischemic or nonischemic, optimized on CHF meds first and for >9 month for NIDCM*
- *Documented unprovoked VT*
- *VT in the post-MI period >48hrs*
- *Survival of VT/VF cardiac arrest*
- *Hypertrophic cardiomyopathy*
- *Brugada syndrome / Long QT syndrome with +ve history of SCD or FH of SCD*

Dual vs Single Chamber ICD

- *Refers to whether or not there is an Atrial Lead*
- *All ICDs are pacemakers too*

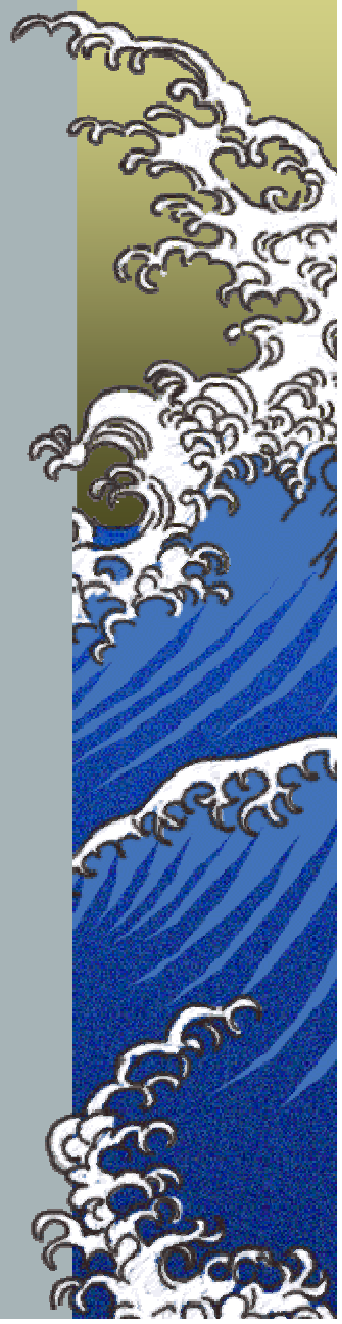
- *An atrial lead is indicated when:*
  - *Pt has a variety of SVTs and you want the device to distinguish better between VT and SVT (i.e. avoid inappropriate shocks)*
  - *Pt has an indication for a dual chamber pacemaker other than their indication for an ICD*

Biventricular Devices

- *Refers to a device with a lead in the RA, RV and LV*
- *CHF with EF<35% and a wide QRS (>130ms), class II-IV*
- *Has indications for an ICD as well*
- *Most effective if they are in sinus rhythm but there are ways to program some in AFib*
- *The purpose is to improve LV function by restoring RV/LV synchrony*

Overview of Bradycardias

- *The next 14 EKGs are examples of various bradycardias you may see on the floors. For each we will review the rhythm, and then discuss whether a pacemaker is indicated…*



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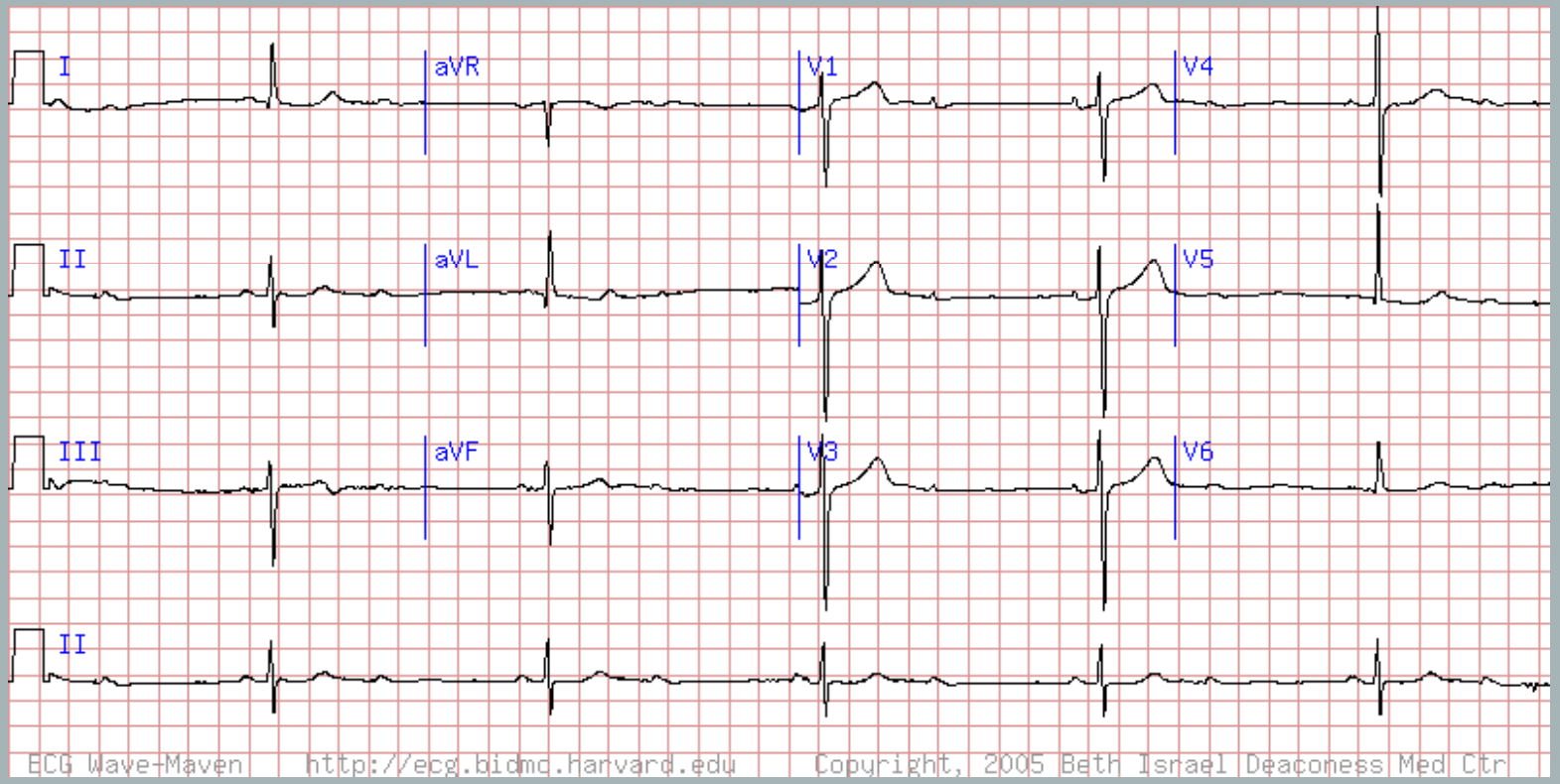
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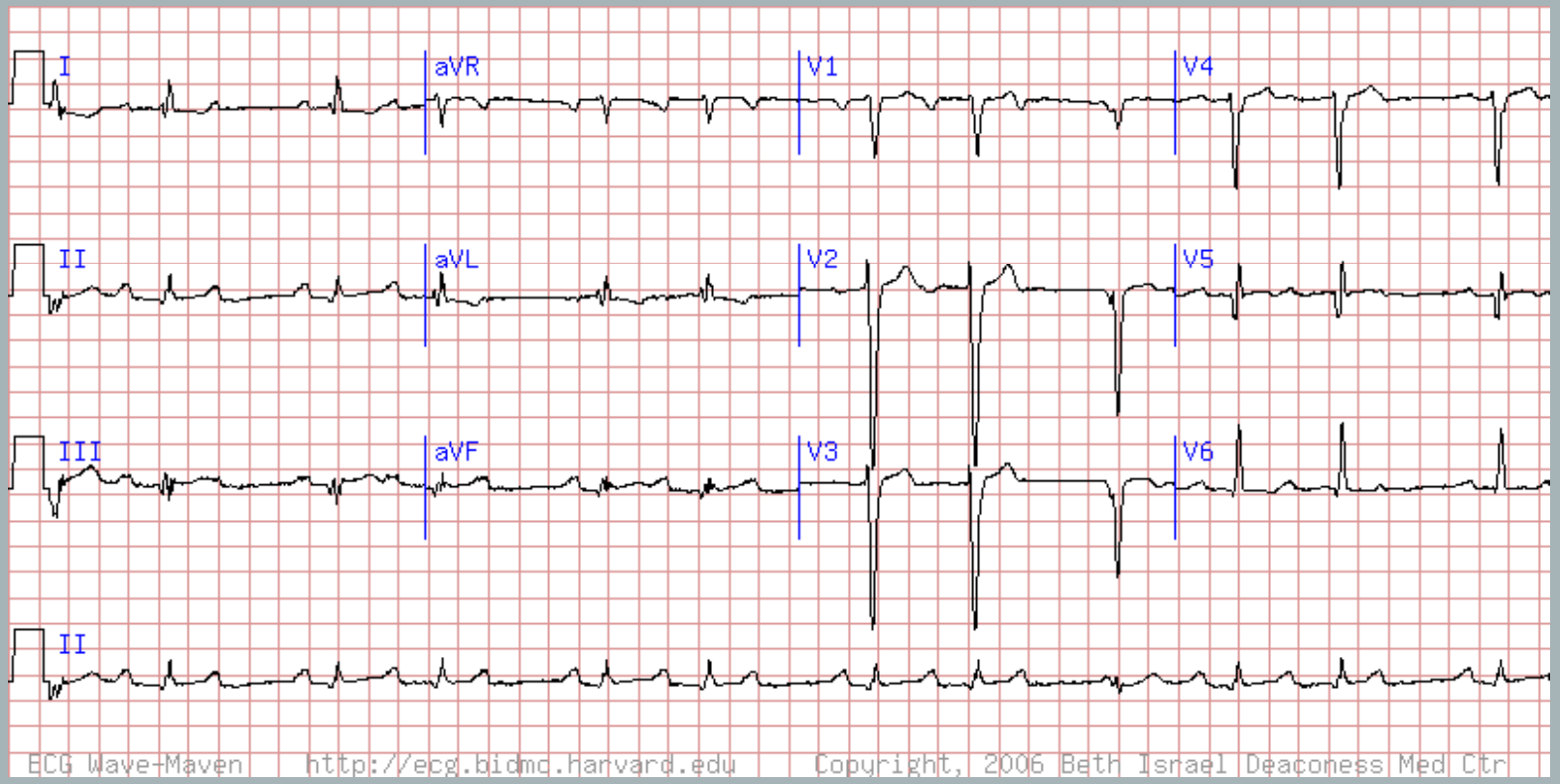
2:1 AV Block

- *85 y/o with symptoms of presyncope/syncope and poor exercise tolerance*
- *You don't know whether the rhythm is Type I or II because it is 2:1. This is important as Type II is much more dangerous*
- *Can try provocative studies (i.e. exercise, atropine)*
- *Pacemaker??? What kind???*

Case 2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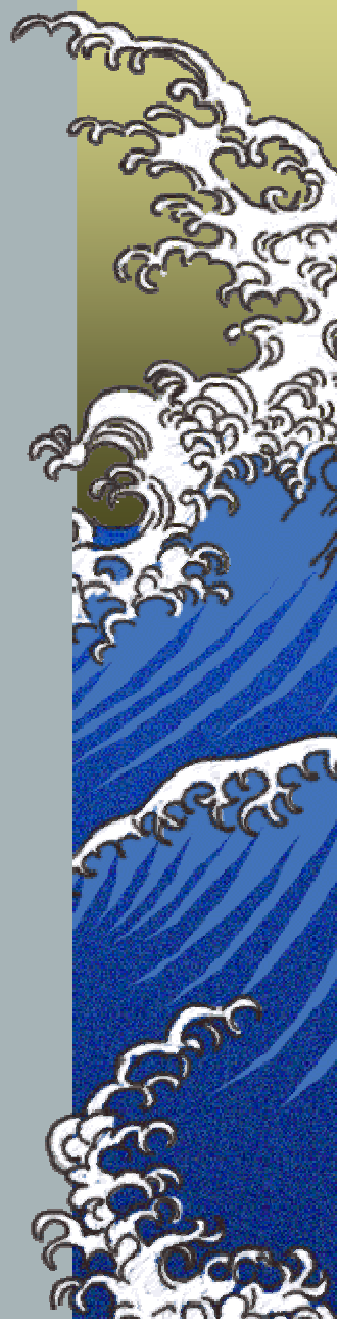
3:2 Wenkebach

- *A type of 2nd degree AV block occurring at the AV node level*
- *Usually harmless, though some people may have chronotropic incompetence*
- *Pacemaker??? What kind???*



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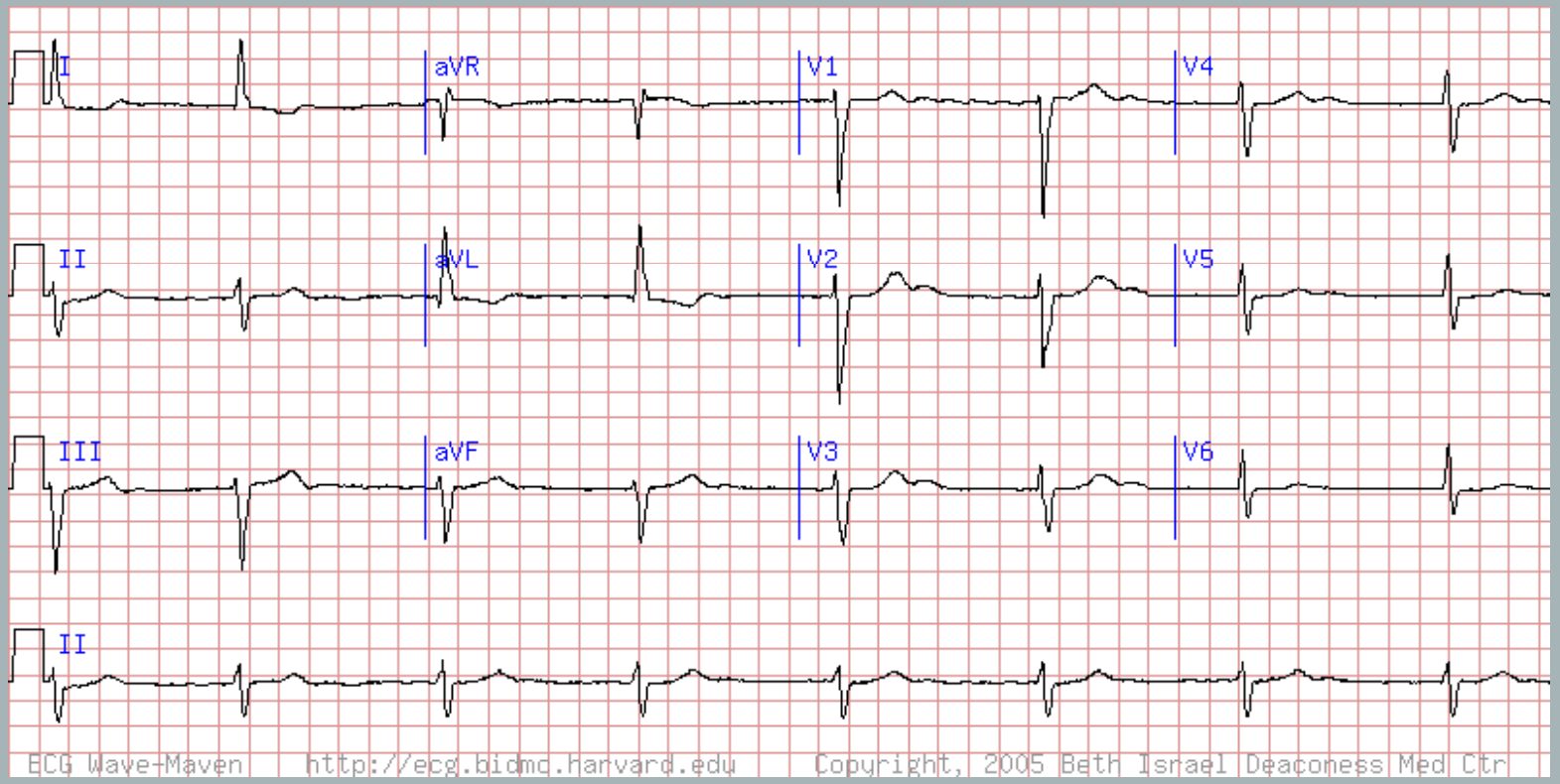
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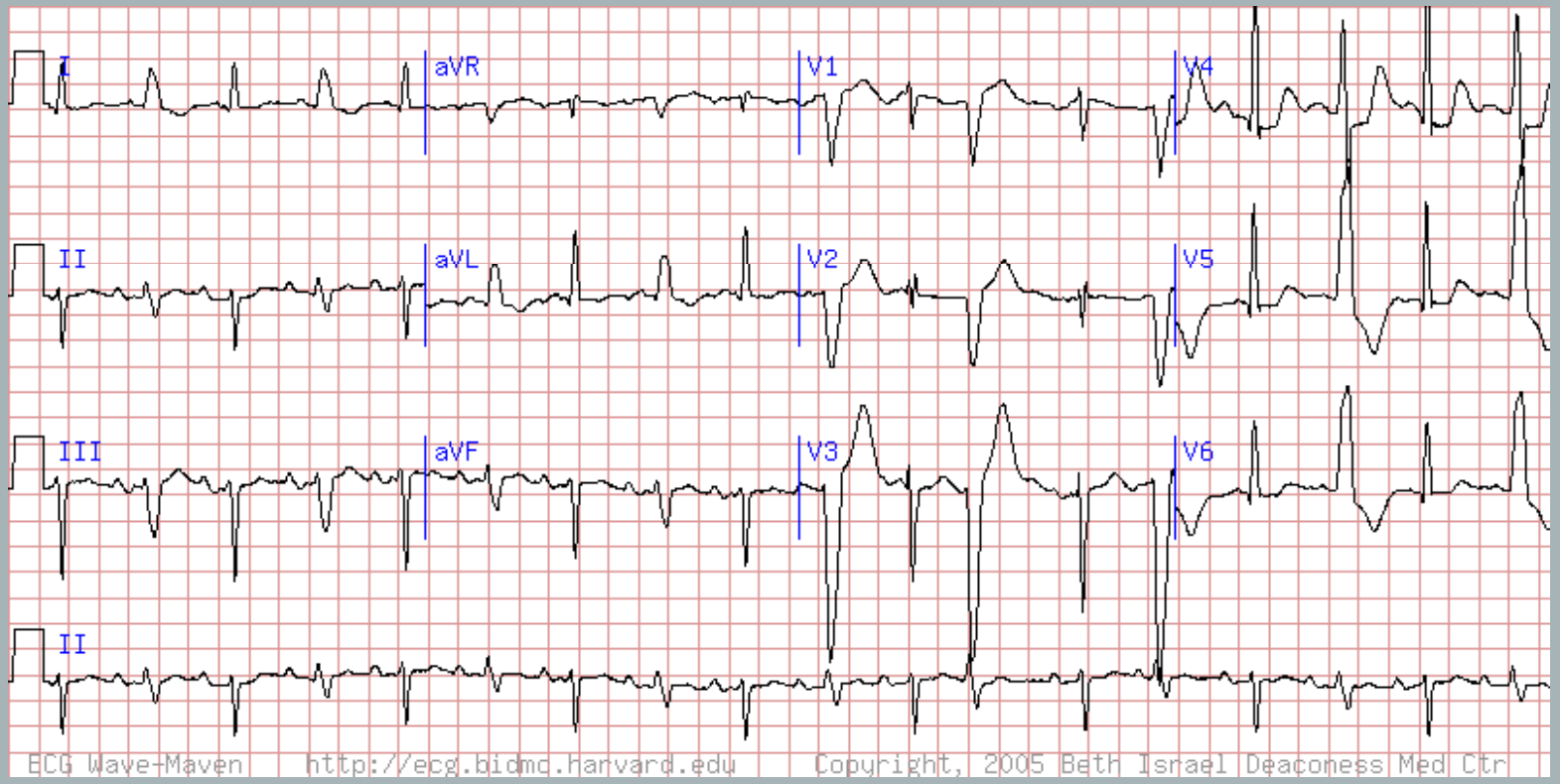
Atrial Fibrillation with Complete Heart Block

- *Notice the 'regularized' ventricular rate, which cannot happen if there is communication between the fibrillating atrium and the ventricle.*
- *The escape rhythm is junctional*
- *Pacemaker??? What kind???*

Case 4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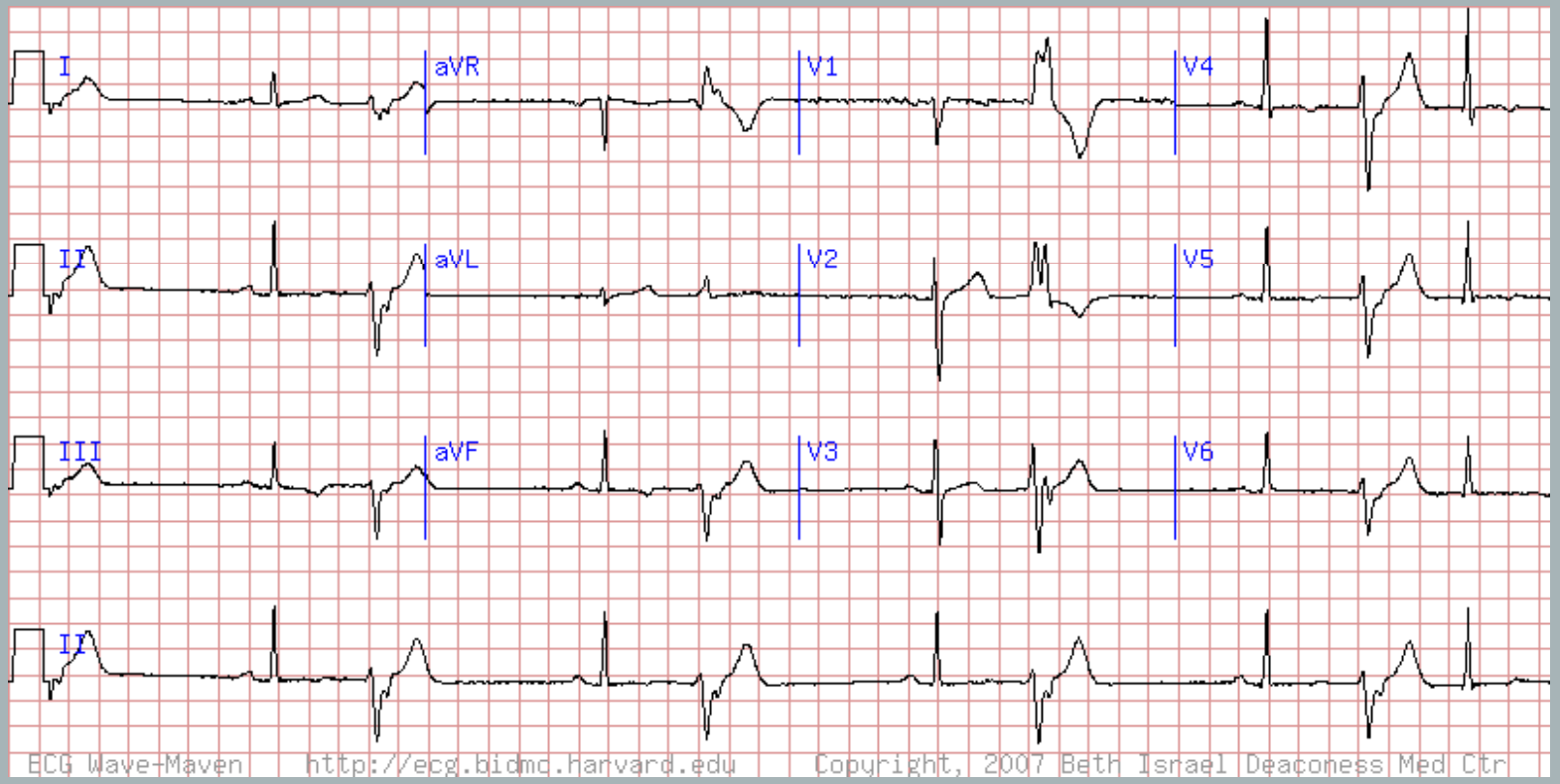
Alternating LBBB/LPFB

- *An alternating bundle branch block is sometimes an unstable condition*
- *Especially if there is preexisting disease, 'bifascicular block', which are high risk for degenerating into complete AV block with a poor escape rhythm (i.e. ventricular rhythm)*
- *Pacemaker??? What kind???*

Case 5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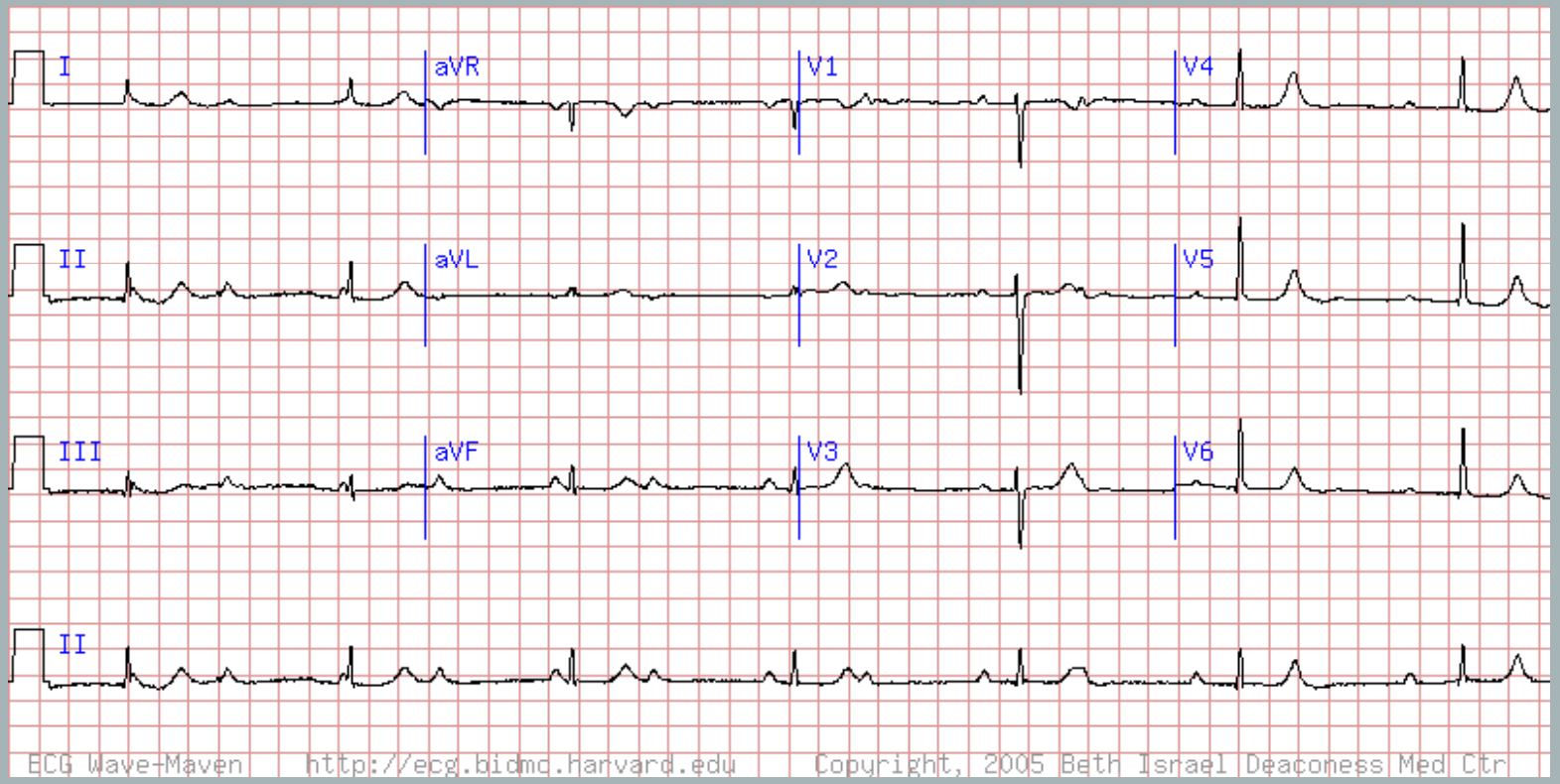
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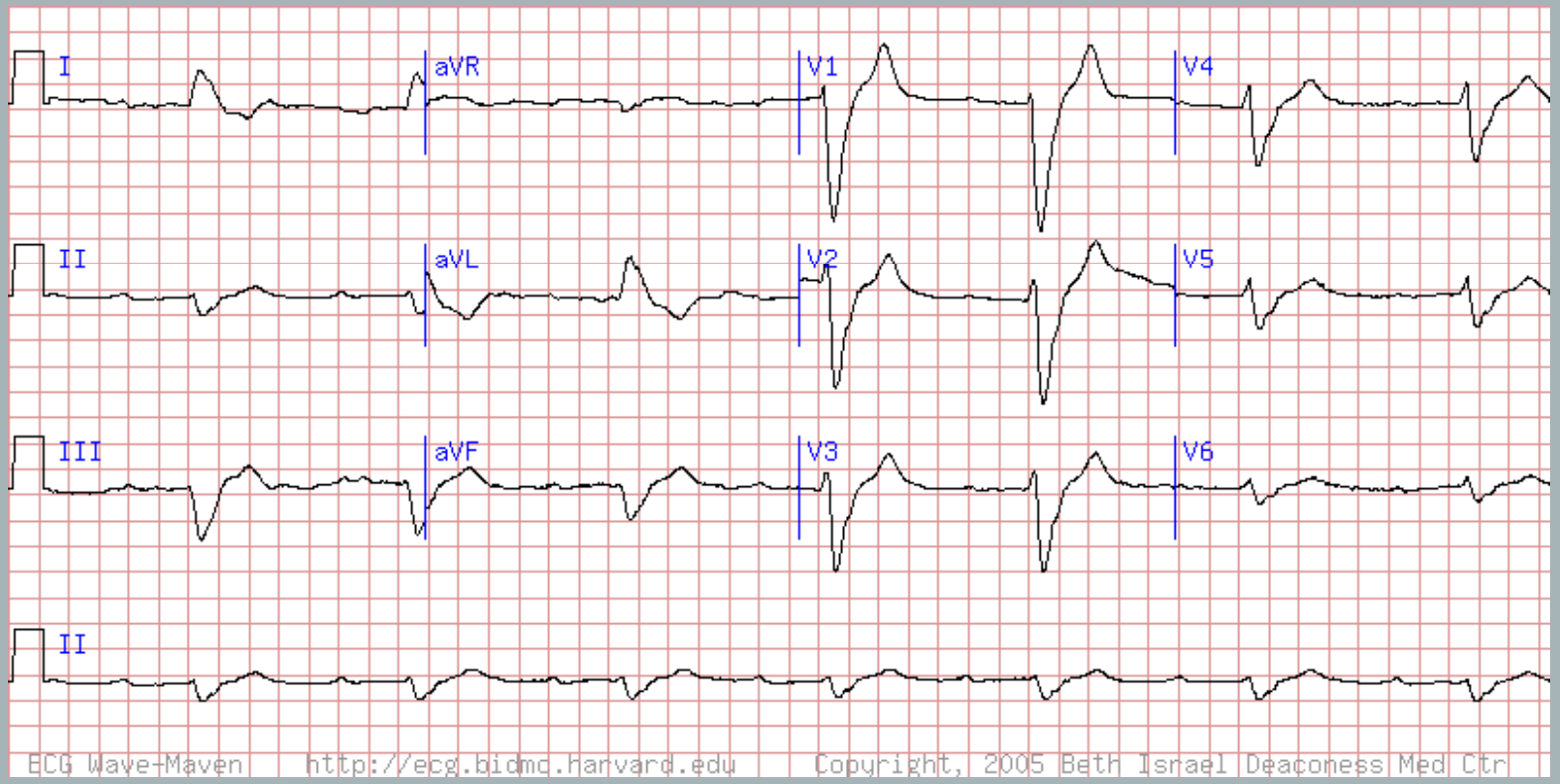
Ventricular Bigeminy

- *Often occurs in patients with other myocardial disease (ischemia, CHF)*
- *A main concern is the actual underlying sinus rate is very slow (i.e. ½ of the read rate)*
- *However, most is asymptomatic*
- *Pacemaker??? What kind???*

Case 7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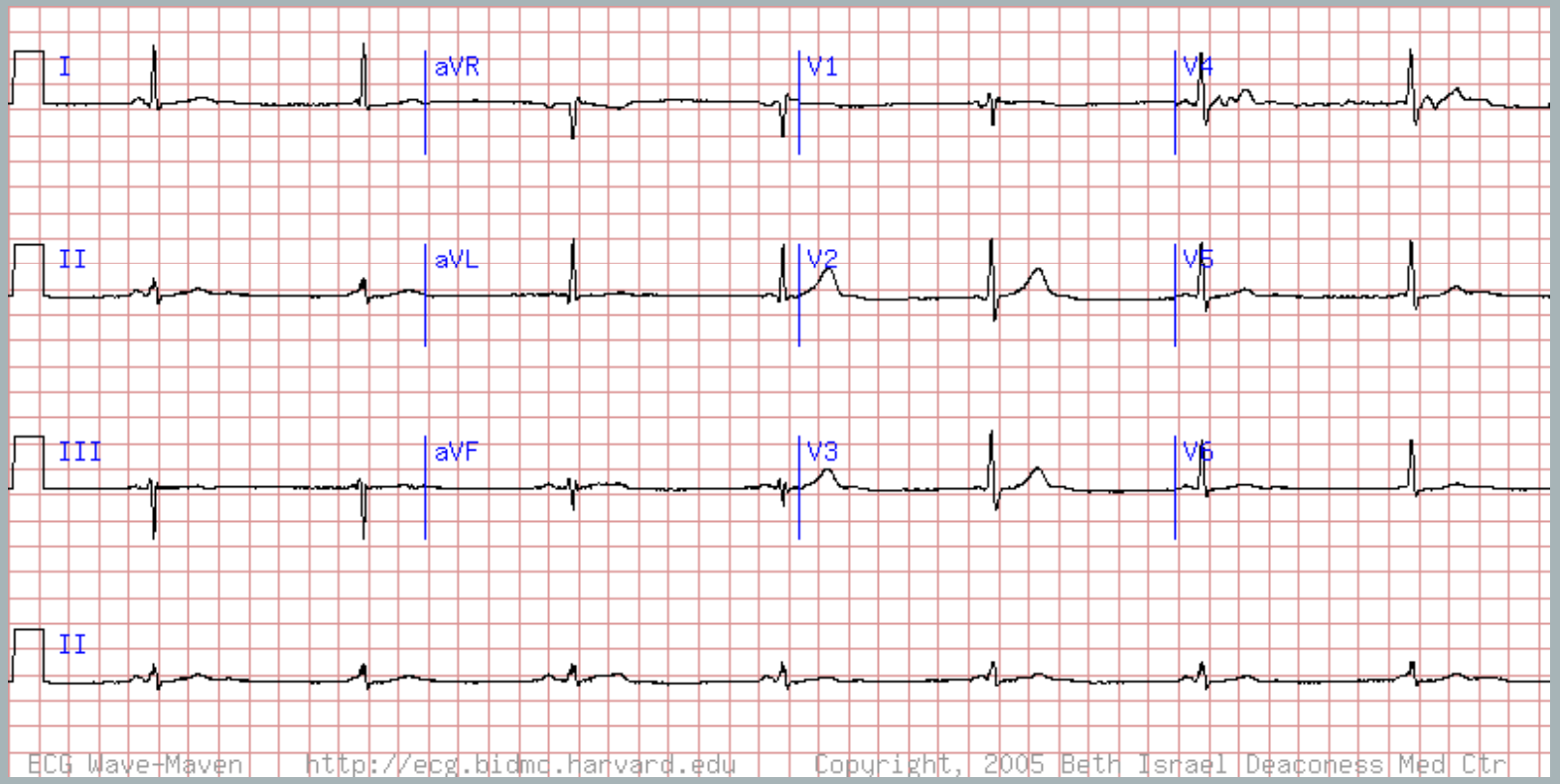
Wide complex brady due to hyperkalemia

- *Often a very dangerous rhythm, if the K is not dealt with immediately. There is absence of P waves on the EKG, and the QRS and T merge to a 'sinoventricular' pattern that can look like VT*
- *Pacemaker??? What kind???*

Case 8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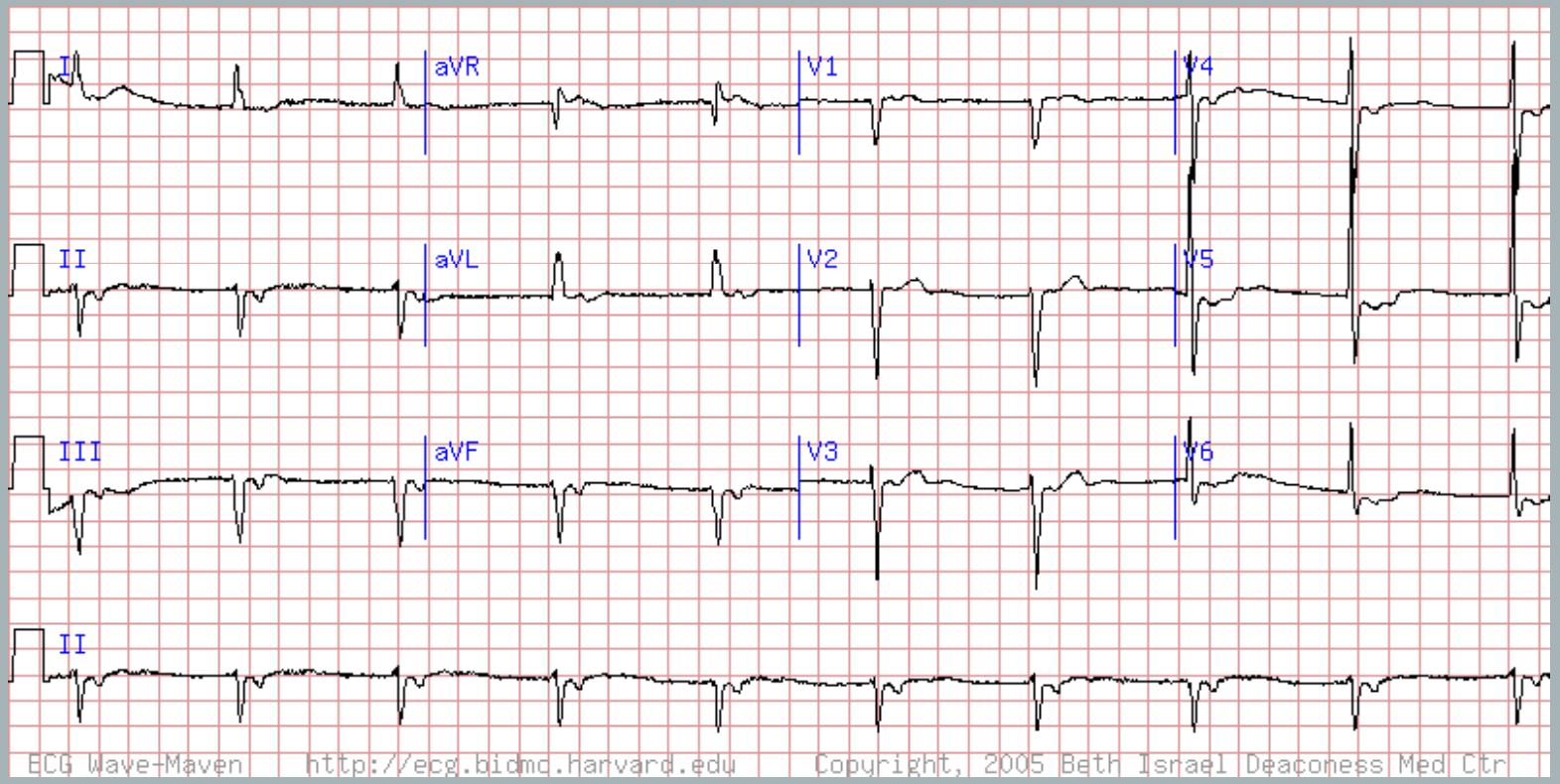
Isorhythmic Dissociation

- *A type of complete heart block, characterized by a very similar atrial and ventricular rate.*
- *Can be confused with sinus bradycardia*
- *Long rhythm strips can pick up slight differences in the A/V rates*
- *Pacemaker??? What kind???*

Case 9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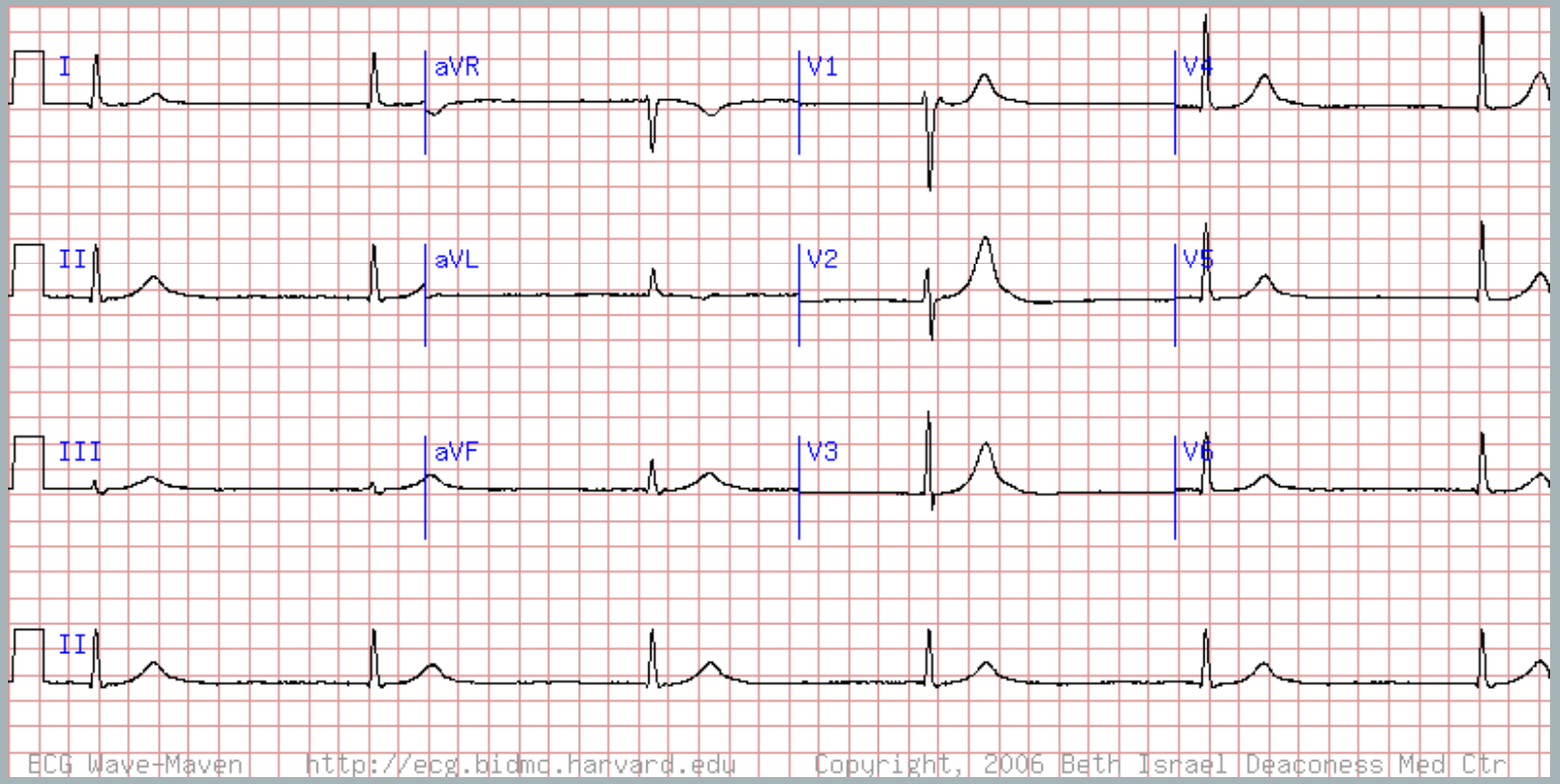
Junctional Bradycardia

- *Notice the P waves following the QRS, and that they are inverted in places we expect them upright*
- *This is due to retrograde conduction, which some people have*
- *Depending on how much retrograde AV block there is, the p wave may be right after, right before, or buried in the QRS*
- *Pacemaker??? What kind???*

Case 10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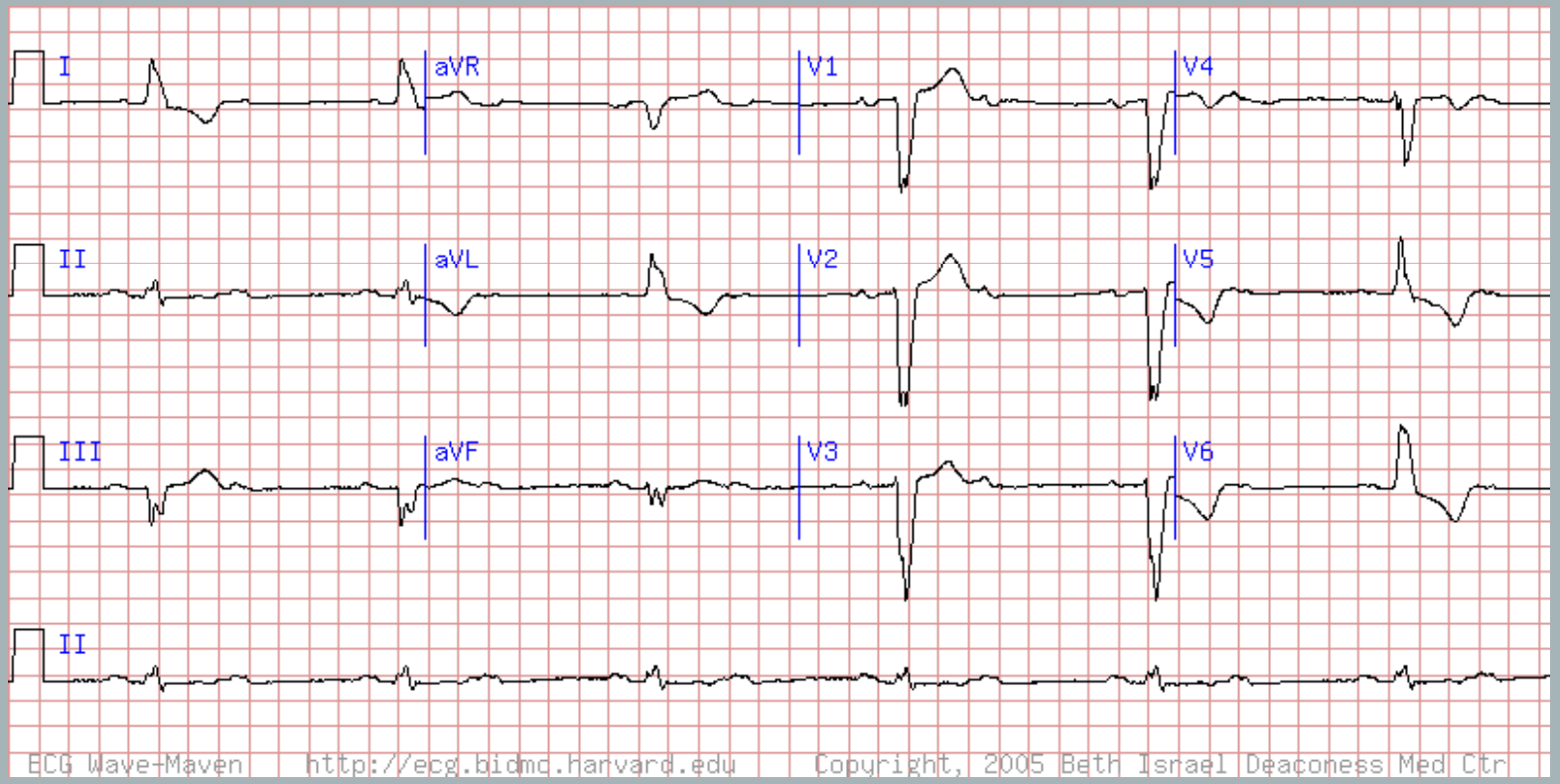
Junctional Bradycardia

- *In this example there are no noticeable P waves. Perhaps they are buried in the QRS or the patient does not have retrograde ventricular to atrial conduction*
- *Pacemaker??? What kind???*

Case 11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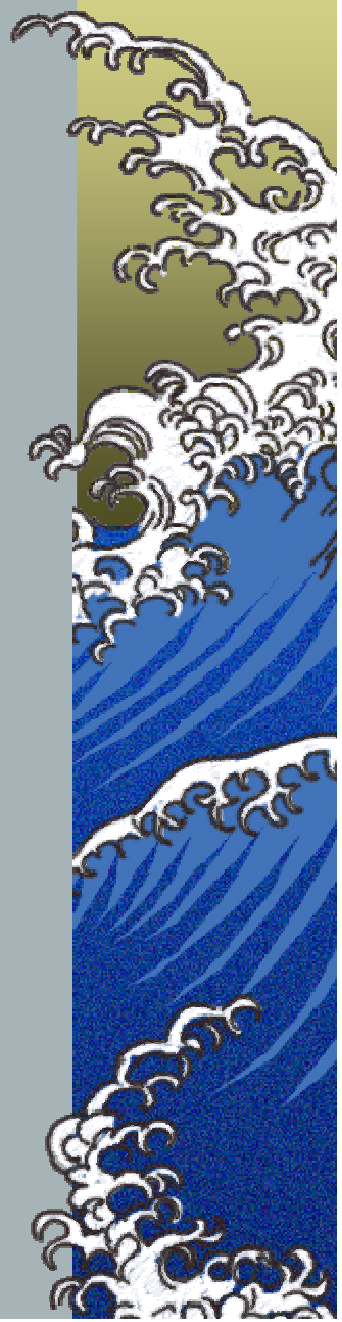
LBBB and 2:1 AV block

- *The existence of both a LBBB and AV block demonstrates widespread conduction disease*
- *Pacemaker??? What kind??? What if they have CHF with a low EF???*



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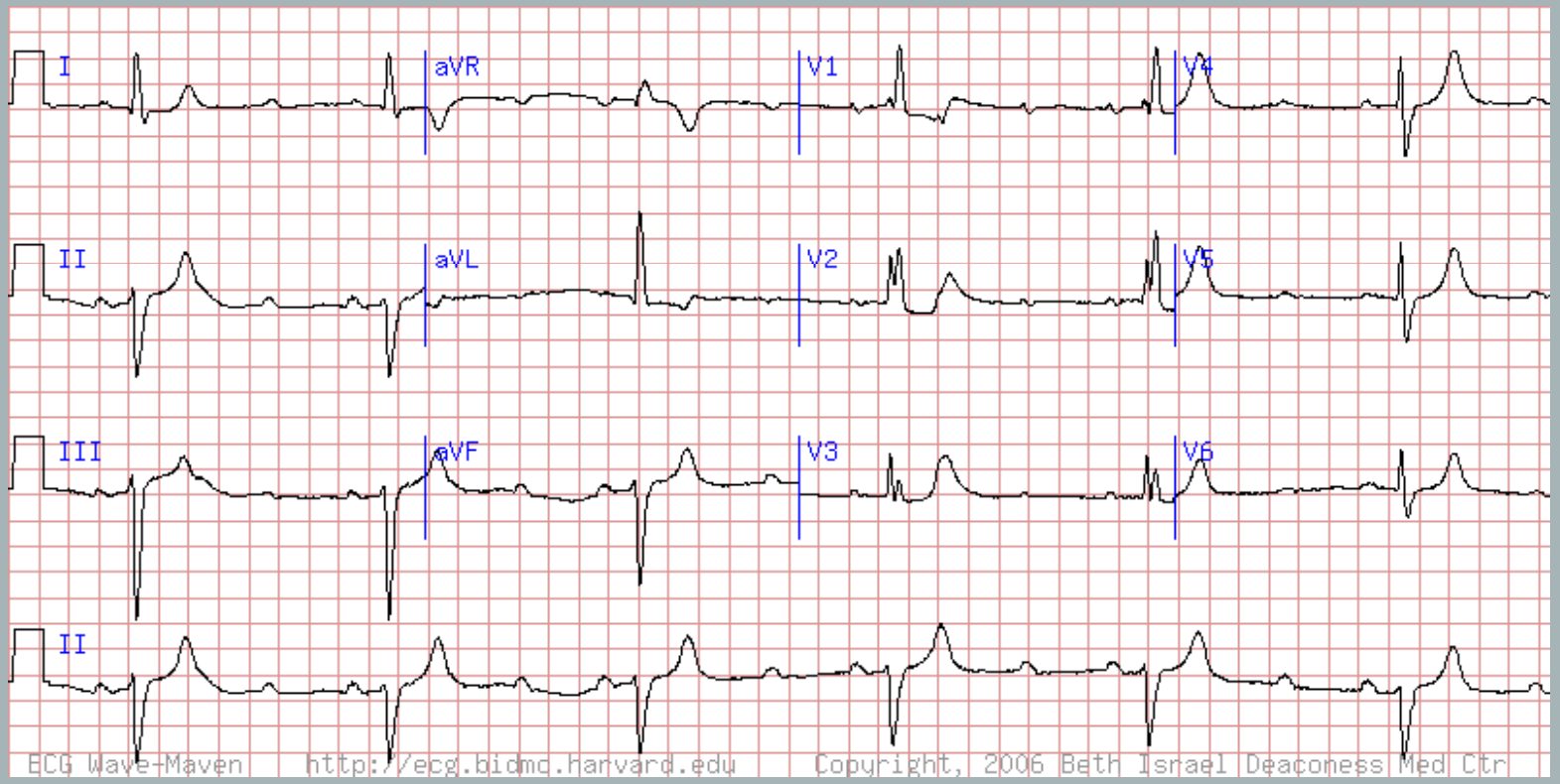
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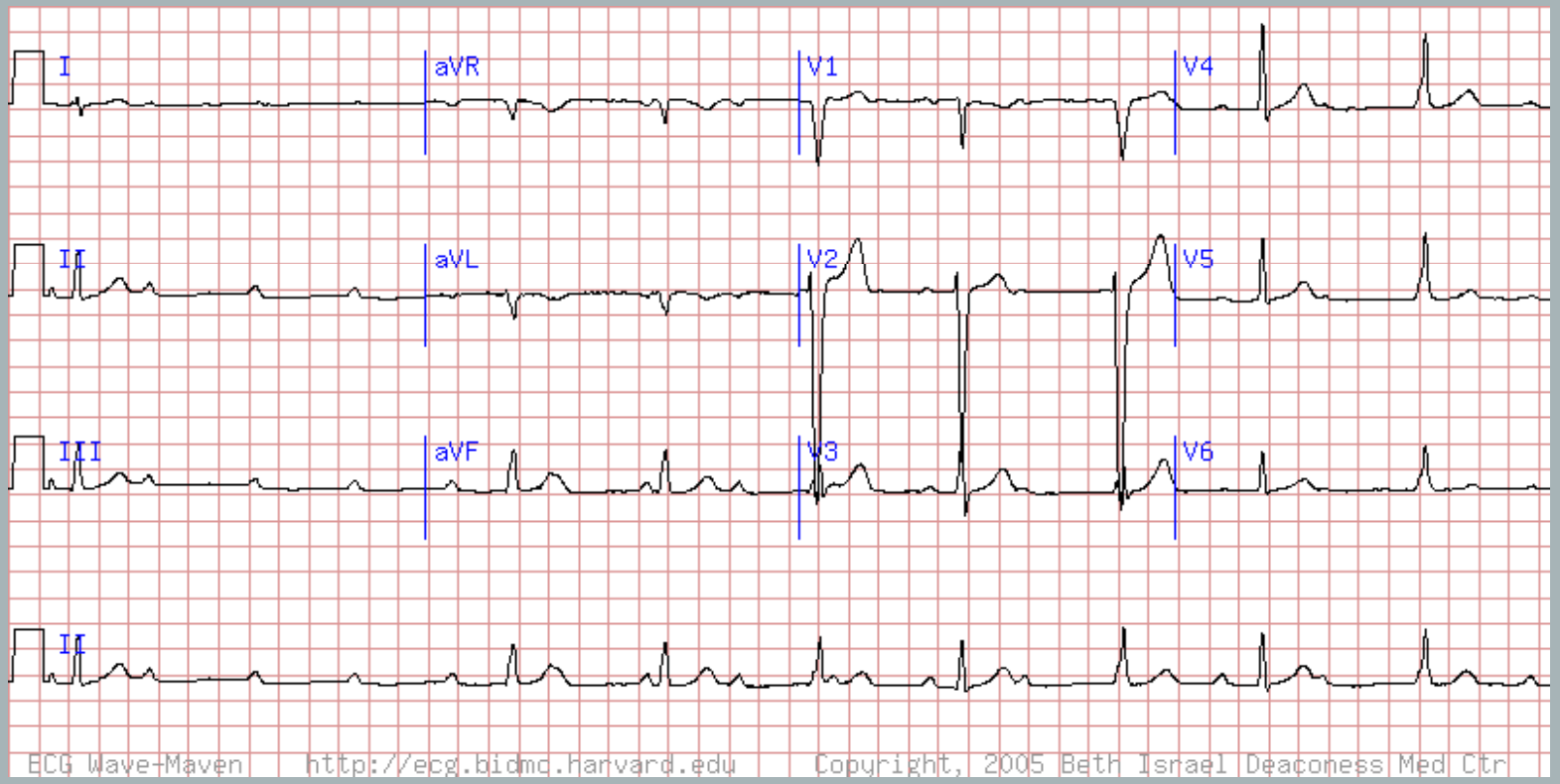
2nd Degree type 2 AVB

- *Notice that this QRS is wide in addition. This makes it more likely for the escape rhythm to be very low in the his-purkinje system (i.e. very slow ventricular) if the patient degenerates into 3rd degree block*

- *Pacemaker??? What kind???*

Case 13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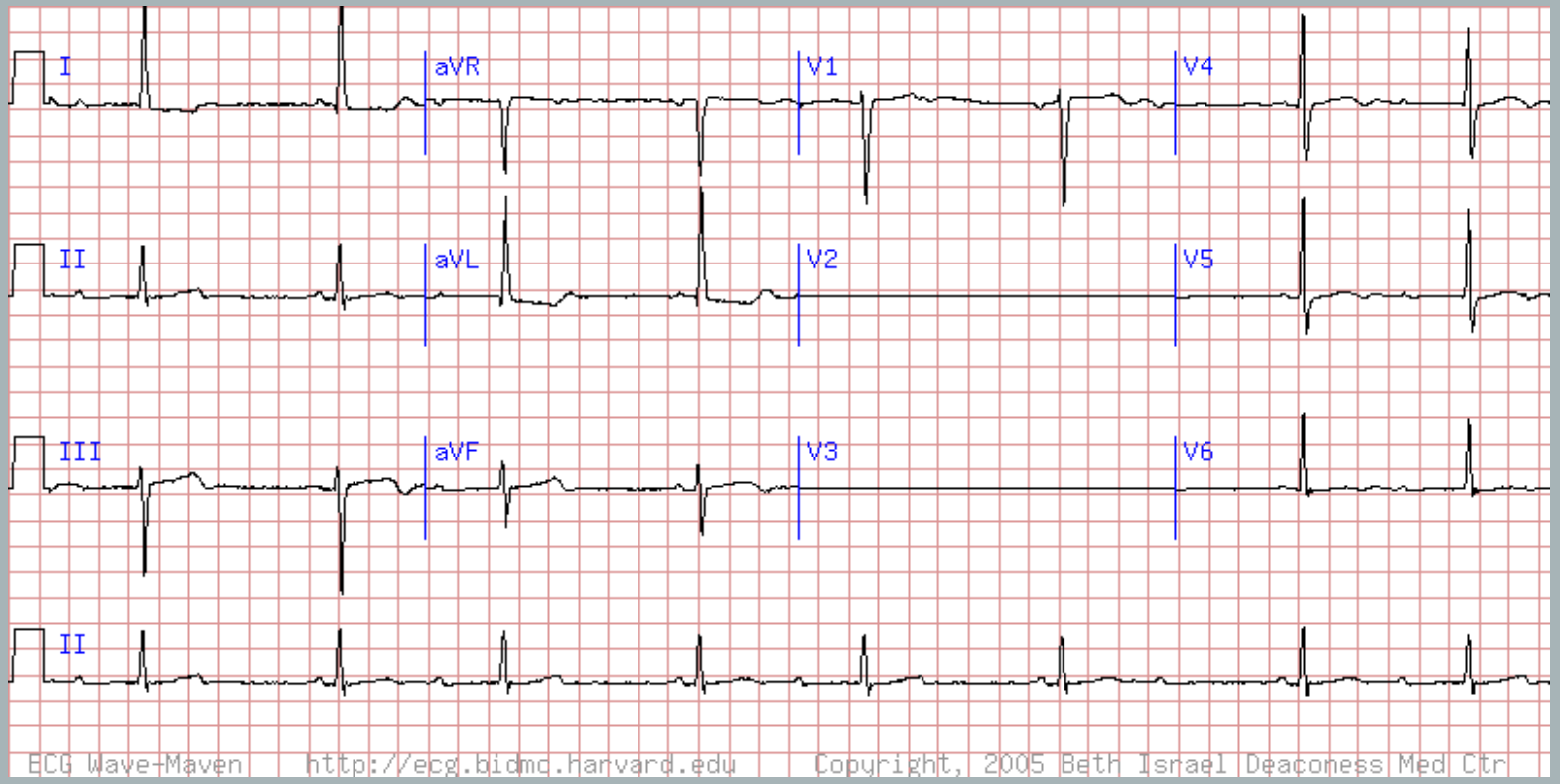
Type II 2nd Degree AV Block

- *The complex is narrow, which is reassuring that the escape rhythm would be high up (i.e. faster and stable)*
- *However, there is absence of any ventricular activity for 3 seconds*
- *Pacemaker??? What kind???*

Case 14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Type II 2nd Degree AV Block

- *The QRS is narrow, so this is reassuring*
- *However, many times just having Type II 2nd degree block is a stronger predictor of degenerating to complete block*
- *Pacemaker??? What Kind???*

The End

- *Thank you for participating!!!!*
- *Questions???*