EKG/Arrhythmia Conference

Extreme EKGs

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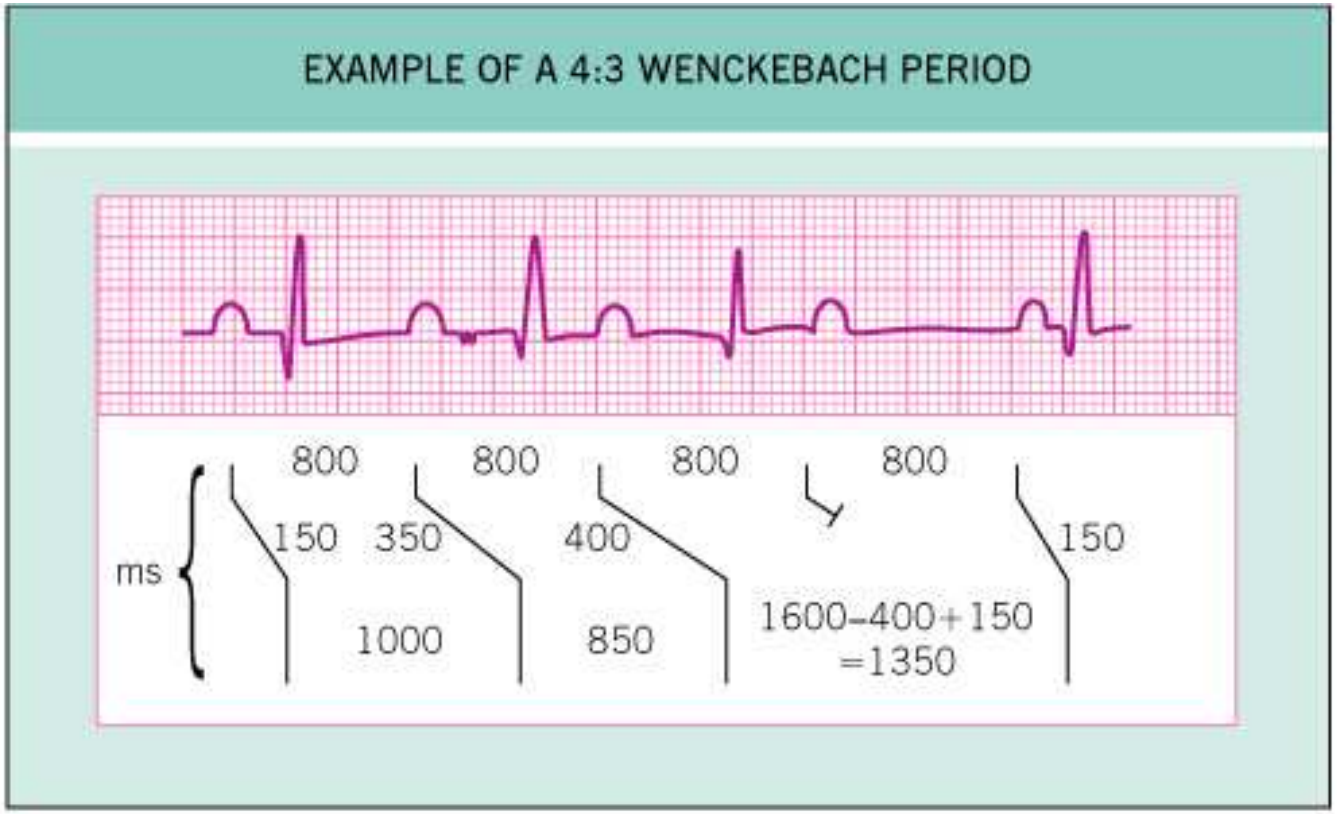
Rules of an “EKG” Conference

- If it looks normal, it probably is not normal
- When experts are present, there WILL be a plausible explanation for the EKG
  - Avoid saying ‘looks like a bunch of PVC’s’
  - Yes, it’s true that some patterns can NEVER objectively be evaluated by surface EKG and/or EP study – you may just have to take their word for it
- Look for any patterns in the EKG for clues to diagnosis
  - PP, RR, PR, RP
  - Ladder diagramming what you see may help
- When all else fails, describe what you see



Typical theoretical example of a 4:3 Wenckebach period. The baseline sinus rhythm is 75bpm, which corresponds to a cycle length of 800ms. The first PR interval of the sequence is 150ms. The second P wave is conducted with a PR interval of 350ms, which is due to an increment of 200ms in the atrioventricular nodal conduction time. The third PR is longer but, because the increment is decreasing, the PR interval is prolonged by only an additional 50ms and is now 400ms. The fourth P wave is blocked. Analysis of the QRS sequences show group beating of the three conducted beats that tend to cluster towards the end of the period, which always ends with a long diastole.

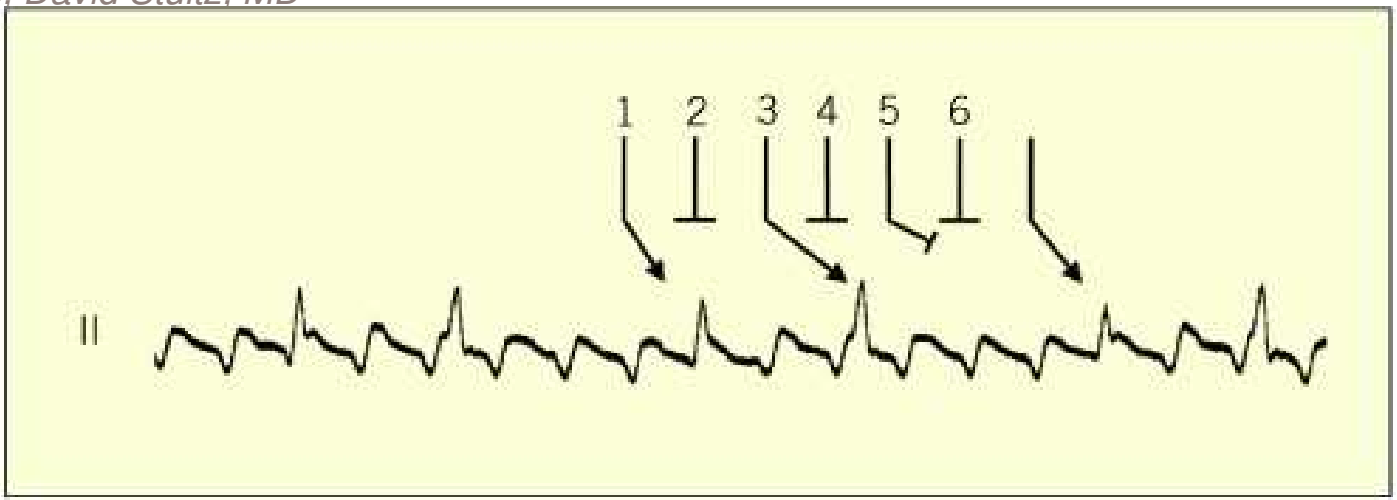
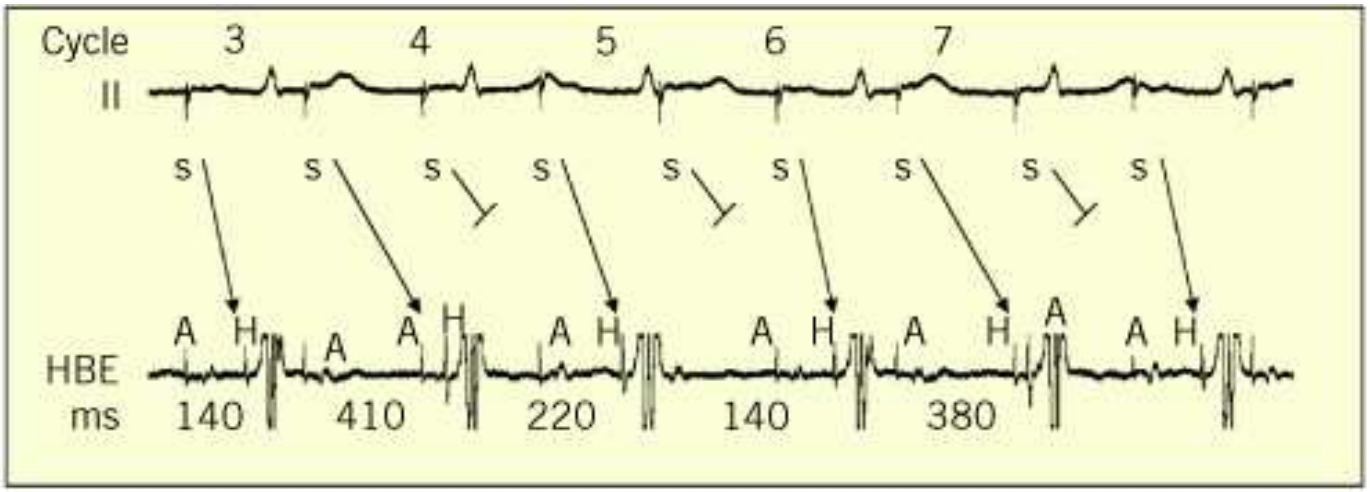
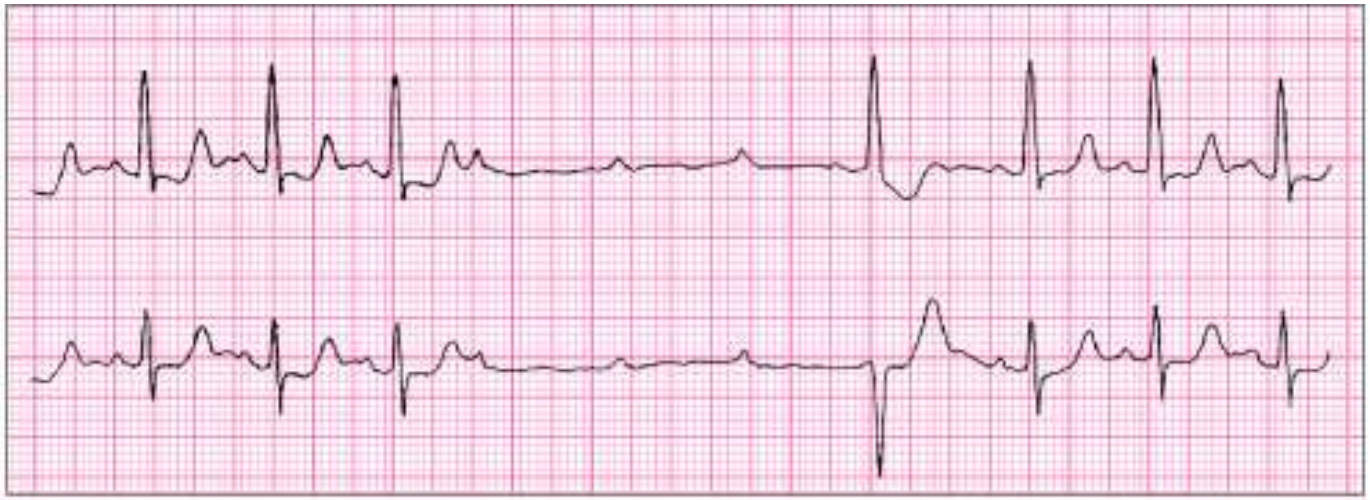


Fig. 6.11 Alternate Wenckebach periods. In this example, which was observed during typical atrial flutter, there is a 6:2 relationship between the paced A waves and the resulting QRS complex. The ladder diagram shows what occurs in a model of dual-level of block within the atrioventricular (AV) node when the upper block is of the 2:1 type and the lower block is of the Wenckebach type. The first impulse crosses both levels with the usual AV nodal delay. The second impulse blocks in the zone of 2:1. The third impulse is conducted across both areas with a longer distal delay. The fourth impulse blocks in the zone of 2:1 but the fifth impulse blocks because it is the third beat of the distal 3:2 Wenckebach sequence. The sixth impulse blocks in the zone of 2:1 and the period resumes. This can be described by the formula 2n+(2/n), where n is the number of observed QRS complexes within a given period. This can be indirectly diagnosed by the observation of ‘group beating’ that is typical of Wenckebach periods.



Reverse alternating Wenckebach periodicity during fixed-rate atrial pacing at a cycle length of 400ms. The three first atrial pacing spikes capture the atrium, resulting in a 3:2 Wenckebach AV nodal sequence. This is followed by a sequence of 2:1 AV block during which AH of the conducted beat measures 220ms. The sixth AH is then shorter than that of the 2:1 period and this is now 140ms. It is the first beat of a new 3:2 period, and the subsequent (seventh) AH is 380ms; this precedes the dropped beat. If this period is again followed by a single 2:1 period of AV conduction, it bears the name of reverse alternating Wenckebach period. It is best described by the sum of the atrial beats of both periods (3+2) divided by the number of resulting ventricular beats (2+1) (i.e. 5:3). S, electrical pacing spike; HBE, His bundle electrogram; numerical values are those of AHs.



High-grade atrioventricular (AV) block. During a Holter recording, the first three P waves are conducted with a normal PR interval. The fourth, fifth, sixth and seventh P waves are blocked and normal AV conduction resumes with the sixth P wave. The fourth QRS complex is an escape beat of ventricular origin.