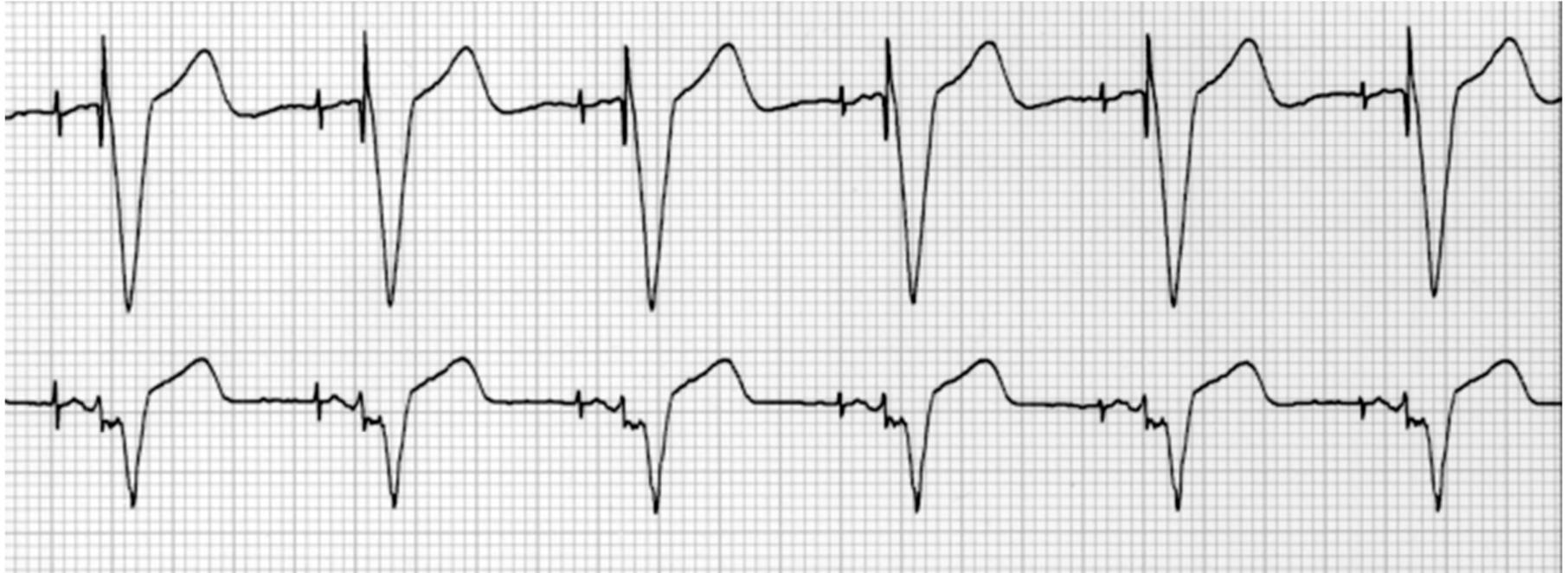


- Dual-chamber pacemaker (DDD), normally functioning



- Atrial and ventricular pacing and sensing
  - For atrial sensing, need to demonstrate inhibition of atrial output and/or triggering of ventricular stimulus in response to intrinsic atrial depolarization
  - If the rate of the intrinsic rhythm falls below the programmed pacemaker rate, there will be atrial (A) and ventricular (V) paced beats with defined intervals between the A and V spikes (A-V interval) and from the V spike to the subsequent A spike (V-A interval)

- Following V sensed activity (either QRS or paced [V] beats), the timing clock is reset. If intrinsic atrial activity (P) is sensed prior to the end of the V-A interval, atrial output of the pacemaker will be inhibited. If no intrinsic atrial activity (P) is sensed by the end of the V-A interval, an atrial paced beat will occur
- Following atrial sensed activity (either intrinsic [P] or paced [A] beats), the timing clock is reset. If intrinsic ventricular activity (QRS) is sensed prior to the end of the AV interval, ventricular output of the pacemaker will be inhibited. If no intrinsic ventricular activity (QRS) is sensed by the end of the A-V interval, a ventricular paced beat will occur

Advanced dual-chamber (DDD) pacemakers may be programmed to shorten the AV interval as the sinus rate increases; however, the AV interval will remain fixed when the sinus rate is constant.

Remember, a paced P wave that is not followed by either a paced or native QRS complex when a dual chamber pacemaker is programmed in the DDD mode is evidence of either: (1) failure of ventricular output (sensing is appropriate but the pacemaker is not able to deliver a pacemaker spike due to a problem internal to the pacemaker); (2) oversensing (the pacemaker senses something in the AV interval that it misidentifies as ventricular activity such as a T wave or external artifact); or (3) failure to capture (a pacemaker spike is generated and occurs at the appropriate AV interval timing but fails to capture the ventricle).