Left Bundle Branch Block—
Significance of the Spatial QRS Axis (Vector)

David H Spodick, MD, DSc, FACC

An electrocardiogram (ECG) of an 82-year-old woman (see Figure 1) showed complete left bundle branch block (LBBB: QRS duration 148ms), left axis deviation to -52°, rS complexes in V1–V6, absence of septal Q-waves, and first-degree atrioventricular block (PR 236ms). The textbook diagnosis of LBBB includes wide (≥120ms) QRS and late (45ms or longer) intrinsicoid deflection in V5 and/or V6; however, in this case rS (rather than R–R1) complexes yield an approximately 20ms ‘intrinsicoid deflection’ (ID) for these leads (ID is lead-dependent and equal to the onset of the final R, r, or R’ downstroke in a unipolar lead; the only possible unipolar lead in this case is aVL, with ID onset at 45ms). This is common with, and a function of, left axis deviation. All ECG complex axes (mean vectors) exist in 3D space, i.e. they have spatial...
vectors. This is often overlooked since in clinical practice usually only the frontal plane is measured. Finally, determining the onset of the ID is the essential factor with an ECG rather than relying on the usual fractured R-waves (R–R') as taught by ‘cookbook’ (rote pattern-recognition) ECG. R–R’ double-peaked with late R is usual with bundle branch blocks, usually aiding the interpretation, but is only ‘hinted at’ here in aVL with its late-onset ID. Any significant frontal axis deviation implies that the spatial axis is also deviated.