

CARDIOVASCULAR DIAGNOSIS WITH FREQUENCY SPECTRAL
ANALYSIS (FSA) AND CONTINUOUS WAVE DOPPLER (CWD)

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This presentation reviews the Doppler characteristics of a wide range of cardiovascular lesions which are specifically diagnosed in our laboratories by CWD combined with FSA. Reliance is placed on the capabilities of CWD frequency resolution to detect spatial and temporal changes in blood velocity as well as the specific patterns associated with orifices of acquired and congenital lesions. Specific detectable hemodynamic orifice abnormalities are (1) upstream decreases in velocity and enhancement of wall compliance, (2) intraorifice manifestations of increased velocities and flattening of the velocity profile, (3) downstream abnormalities of turbulence and disturbed flow as well as vascular wall vibrations, decreased velocities and diminished accelerations, (4) collateral effects of increased velocities in adjacent arteries and changes in flow direction in connecting branches.

Large artery orifices diagnosed include stenosis of the aorta, ileofemoral, and popliteal; innominate, subclavian, axillary-brachial and common carotids at their thoracic origins; cervical segments of the vertebral and carotid arteries as well as stenosis of the siphon and intracranial segments of the carotid artery. Cardiac orifice diagnoses include valve stenosis and regurgitation, congenital cardiac septal defects and persistent ductus arteriosus.

The current accuracy of Continuous Wave Diagnosis, in many situations challenges the specificity of angiographic diagnosis but usually compliments invasive and noninvasive modalities in patient management decisions.