VET 433C: Congenital Heart Disease

Disease	Pulmonary Valve Stenosis	Subaortic Stenosis	Patent Ductus Arteriosus	Ventricular Septal Defect
Breeds	Bulldogs, beagle, terriers, chihuahua, schnauzer, pit bull, mastiff	Newfoundland, Golden Retrievers, boxers, German shepherds, rottweilers	Poodles, German and Australian shepherds, collies, chihuahua, yorkies, rottweiler	Cats
Murmur	Left base Systolic Normal femoral pulse	Left base Systolic Weak femoral pulse	Left base Continuous Bounding femoral pulse	Right sternal border Systolic
Physical Exam	Murmur Jugular distention/pulsation Arrhythmia Generalized cyanosis Right-sided CHF	Murmur Arrhythmia Slow to rise and weak Femoral pulse deficit Left-sided CHF	L > R PDA Murmur L-sided CHF R > L PDA *uncommon No murmur Differential cyanosis Hind end weakness GI signs	L to R VSD Murmur Normal pulse quality L-sided CHF with large defects R to L VSD Severe pulmonary hypertension may be present No/soft murmur Generalized cyanosis Signs of R-sided CHF
Radiographic Findings	Dilated R auricle Dilated pulmonary artery Right ventricular enlargement (Reverse D)	Dilated Aorta Left Atrial dilation Left ventricular dilation Left auricular dilation	L auricular enlargement L atrial enlargement LV enlargement Pulmonary vascular pattern	Dependent on VSD location
Echo Findings	Thickened leaflets RV concentric hypertrophy +/- RA enlargement Post-stenotic dilation of main pulmonary artery Normal pressure gradient ~4 mmHg <50 mmHg mild	Concentric LC hypertrophy Subaortic lesion varies Turbulent left ventricular and aortic outflow +/- aortic insufficiency Pressure gradient between LV and Ao in systole ~4 mmHg <50 mmHg mild	Volume overload (eccentric hypertrophy of the LV) Left atrial enlargement Visualization of the shunt (continuous wave doppler flow Ao > ductus > PA) Reversed PDA (R>L)	Turbulent, high velocity flow from LV to RV Concentric RV hypertrophy if large VSD with pulmonary hypertension Bubbles move across VSD from R to L ventricle

	>80 mmHg severe	>80 mmHg severe	RV hypertrophy Dilated PA No ductal flow Abdominal Ao bubble study	
Treatment Options	Do nothing Balloon dilation of pulmonary valve (check for coronary artery anomalies in brachycephalics!) Stenting of pulmonary valve Beta-blocker (atenolol) Open heart sx *rare	Do nothing Beta-blockers (atenolol) No great interventional or surgical options at this time	L to R PDA Occlusion ASAP R to L PDA No definitive tx Hypoxemia leads to erythrocytosis Sidenafil and phlebotomy for palliative care	Small VSD No tx Usually well tolerated Mild-moderate L-sided heart enlargement in young animals Large VSD Surgical banding or pulmonary trunk Interventional occlusion Open heart sx Complications: L-CHF or Eisenmenger's syndrome
Prognosis	Mild to moderate often have a normal lifespan Severe: lifespan is usually reduced Exercise intolerance Syncope R-sided CHF Generalized Cyanosis Sudden death	Mild to moderate often have a normal lifespan Severe: lifespan is usually reduced Exercise intolerance Syncope L-sided CHF Bacterial endocarditis Sudden death	Good prognosis if L to R and closed Palliative care for R to L	Small VSD Good prognosis Large VSD Variable, not a lot of easy palliations