

# PROTOCOL: CARCINOID HEART DISEASE

**Carcinoid Syndrome**, the primary carcinoid tumor and metastases release serotonin.

*Carcinoid Heart Disease is seen in > 20% of patients with Carcinoid Syndrome.*

**Cardiac manifestations:** Right heart valves thicken/retract resulting in stenosis and/or regurgitation

*Left heart valve involvement possible for those with right-to-left shunts.*

## Inclusion Criteria

- Known carcinoid tumors
- Referral for screening of carcinoid heart disease

## EIMS Data

**Procedure Components:** 2-D Ext, Dop Ext, CFI, TDI, M-Mode, (possible 3D, IV Ag. Saline)

**Serial Study:** General, Pulm. HTN

**First Impression:** Echocardiogram performed per carcinoid protocol.

**Billing Diagnosis:** Carcinoid (select appropriate)

**Procedure:** (TTE) 2D Echo Doppler Color (possible contrast)

**Obtain:** **1) Shunt study** \*initial echo only\* for atrial (rest & Valsalva) or intrapulmonary  
**2) Standard TTE, PLUS the following:**

2D	CFI	Doppler	Measurement
<b>Parasternal</b>			
RV outflow PV - PSAX MV - SAX	RV outflow PV - PSAX	CW - end PR CW - PV gradient/TVI	
<b>Apical</b>			
RV size / fx MV (zoomed) AV (zoomed) TV (zoomed)		CW - TV gradient/TVI CW - MV gradient/TVI	RV diameter - base, mid, length RV area d/s RV strain TAPSE **3D RV volumes and function
<b>Subcostal</b>			
PV RV free wall (zoomed)	PV	PW - hepatic veins CW - end PR CW - PV gradient/TVI	IVC - insp/exp (2D or M-mode) RV free wall thickness

## Caveats and Tips

- **\*If an agitated saline bubble study has been previously performed there is NO need to repeat**
- Careful imaging of the PV including 2D and CW Doppler (for PS and PR) in multiple planes is essential. This should be performed in both the conventional parasternal short axis view as well as in a high parasternal long axis view (RV outflow view)
- Zoomed 2D images of all valves should be performed in all views to allow complete evaluation of valvular thickening and leaflet motion
- **\*\*3D RV volumes and EF should be performed if appropriate equipment and staff are available**