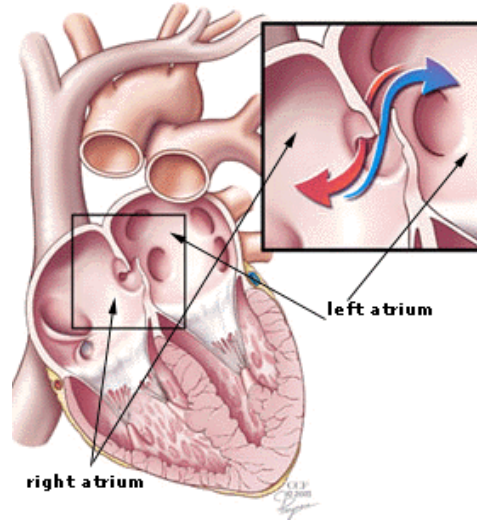


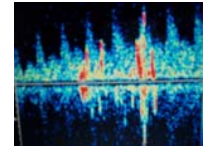
## How to Detect Patent Foramen Ovale (PFO) With Air and Transcranial Doppler



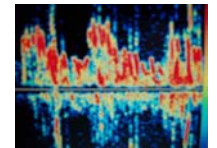
TCD probe is either fixed to the skull with a headband or manually held. The left or right MCA is monitored



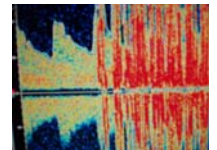
Fewer than 25 microbubbles reflects a PFO most probably undetectable by transesophageal echocardiography. (TEE)



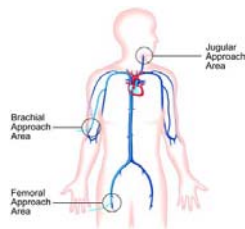
Greater than 25 microbubbles reflect a PFO that most probably will be detected by TEE.



A “curtain” of microbubbles reflect a PFO that will certainly be detected by TEE.

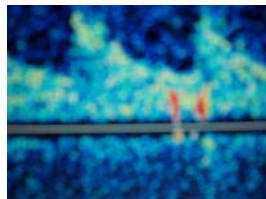


An IV line is run into an antecubital vein with a saline drip initiated. 9mL of saline and 1 mL of air are placed in a 20 mL syringe. A 3-way stopcock is used to agitate the saline creating an air bubble foam which is injected into the vein directly.



### Bubble Run One

The 10cc agitated saline air mixture is injected at 1 mL per second. One or more air emboli detected by TCD strongly indicates that a right to left cardiac shunt exists.



### Bubble Run Two

The 10 mL agitated saline-air mixture is injected at a rate of 1 mL per second. From time 5 seconds to time 10 seconds after the injection is initiated the patient performs a gauged valsalva maneuver of 40 – 60 mmHg over the 5 second period.

