

# MEDfacts

An Educational Health Series From National Jewish Health®



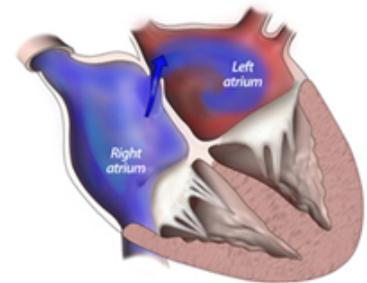
## Intracardiac Shunts

### How do the Heart and Lungs Work?

To understand intracardiac shunts, it is important to understand normal cardiac anatomy and physiology. The heart is divided into two sides, left and right. The right side receives venous (low oxygen) blood returning from the rest of the body and in turn pumps the blood to the lungs. Blood flowing through the lungs is exposed to oxygen from breathing. This turns venous blood into arterial (high oxygen) blood. Arterial blood then returns to the left side of the heart where it is pumped to the body.

### What is Intracardiac Shunting?

Intracardiac shunting refers to the diversion of normal cardiac blood flow to alternate pathways within the heart. This is the result of a hole in structures that normally separate arterial from venous blood. These alternative pathways cause blood flow to bypass the normal circulation. This results in the mixing of arterial and venous blood. This mixing of blood can lead to low oxygen levels, decompression illness and strokes. More rarely this can lead to heart rhythm problems, heart failure, and pulmonary hypertension. Most often, these holes exist within the innermost walls of the heart called the interatrial septum. Less frequently, these holes exist within the interventricular septum. Defects in the interatrial septum include patent foramen ovale (PFO) and atrial septal defect (ASD).



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### Do All of Us Have Holes In Our Heart?

All of us have a PFO early in our development. In fact, PFO's are necessary to support our circulation in fetal life. However, shortly after birth, PFO's close spontaneously in 70% of people. While 30% of the population has a residual PFO after birth, only a small percentage will ever require treatment. In contrast, ASD's are relatively rare, occurring in < 1% of the population.

### How is an Intracardiac Shunt Diagnosed?

PFO's and ASD's are often diagnosed by an ultrasound of the heart (echocardiogram). An echocardiogram allows for the visualization of the hole, determination of the direction of the shunt, and estimation of the amount of shunt. Other imaging tests include: transesophageal echo (TEE), cardiac CT, and cardiac MRI (CMR). These may be done if an echocardiogram is inconclusive or if supportive information is required. Cardiac catheterization (and to a lesser extent, CMR) can be performed to give a more accurate estimation of the degree of shunt when the decision to treat is unclear.

### How is Intracardiac Shunt Treated?

Treatment of intracardiac shunts depends on the kind of defect and presence (or absence) of other medical problems. ASD's almost always requires treatment due to the risk of developing heart failure and high blood pressure in the lungs (pulmonary hypertension). Although ASD's can be treated surgically, most are closed with a device that can be delivered via a cardiac catheter.

When PFO's are suspected to cause complications (low oxygen levels, decompression illness or stroke) treatment with a closure device is often done. Although the use of PFO closure devices for low oxygen levels is particularly controversial, we are actively investigating this group of patients. However, it should be noted that in the absence of complications, most PFO's are thought to be benign and require no treatment.

### What do we do at National Jewish Health?

We provide comprehensive cardiology evaluation and consultation and non-invasive cardiac testing. We evaluate and treat heart problems such as coronary artery disease, high blood pressure, high cholesterol, heart valve problems and heart failure. In addition to traditional heart problems, we offer expertise in many other focus areas, including evaluation of patients with shortness of breath with exercise, sarcoid of the heart, diastolic dysfunction and secondary pulmonary hypertension.

### Why National Jewish Health?

At National Jewish Health, we treat the whole person, not just the disease. Our cardiology team works with healthcare providers from all areas of the medical center, including rehabilitation therapists, dietitians and clinical researchers.

Note: This information is provided to you as an educational service of LUNG LINE® (1-800-222-LUNG). It is not meant to be a substitute for consulting with your own physician.

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