

## CHAPTER 15:

# CARDIAC CATHETERIZATION & INTERVENTIONAL CARDIOLOGY

Cardiac catheterization is done to confirm and define the extent of coronary artery disease; to evaluate cardiac function in other types of heart disease (e.g. valvular disease, heart failure, congenital heart disease); and to perform catheter-based interventional procedures to treat coronary artery disease and other cardiac disorders. This chapter provides an overview of diagnostic cardiac catheterization and percutaneous coronary interventional procedures. For more detailed information on these topics, refer to references at the end of the chapter. It is beyond the scope of this chapter to discuss other interventional procedures that are done to treat valve disease, close patent foramen ovale, and occlusion of the left atrial appendage for stroke prevention in chronic atrial fibrillation.

## DIAGNOSTIC CARDIAC CATHETERIZATION

### Right Heart Catheterization

Right heart catheterization is done for the following reasons:

- ◆ to measure right atrial and right ventricular pressures.
- ◆ to measure pulmonary artery pressure.
- ◆ to measure O<sub>2</sub> content of right heart chambers and pulmonary artery.
- ◆ to detect left to right intracardiac shunt.
- ◆ to determine cardiac output.
- ◆ to evaluate tricuspid and pulmonic valves.
- ◆ to evaluate mitral valve function via the transseptal approach.
- ◆ to perform certain interventional procedures (e.g. closure of patent foramen ovale).
- ◆ to perform electrophysiology studies (see Chapter 17).

Right heart catheterization is usually done via femoral venous access but alternate venous access sites can be used, including the internal jugular veins, subclavian vein, or brachial veins. Once the superior or inferior vena cava is reached, the catheter is advanced through the right atrium, right ventricle, and into the pulmonary artery. Pressures are recorded and O<sub>2</sub> saturations are obtained when indicated. Contrast dye can be injected for imaging of the right atrium, right ventricle, or pulmonary artery. Cardiac output is determined using the thermodilution technique (see Chapter 4). In some procedures, such as catheter-based mitral valve repair or closure of patent foramen ovale, the left atrium is accessed via transseptal puncture through the atrial septum.

### Left Heart Catheterization

Left heart catheterization is done for the following reasons:

- ◆ to evaluate coronary artery anatomy.
- ◆ to determine location and significance of coronary artery lesions.
- ◆ to measure left ventricular and aortic pressures.
- ◆ to evaluate mitral and aortic valve function.
- ◆ to evaluate left ventricular function.