

# GIVING CARDIOVASCULAR DRUGS SAFELY

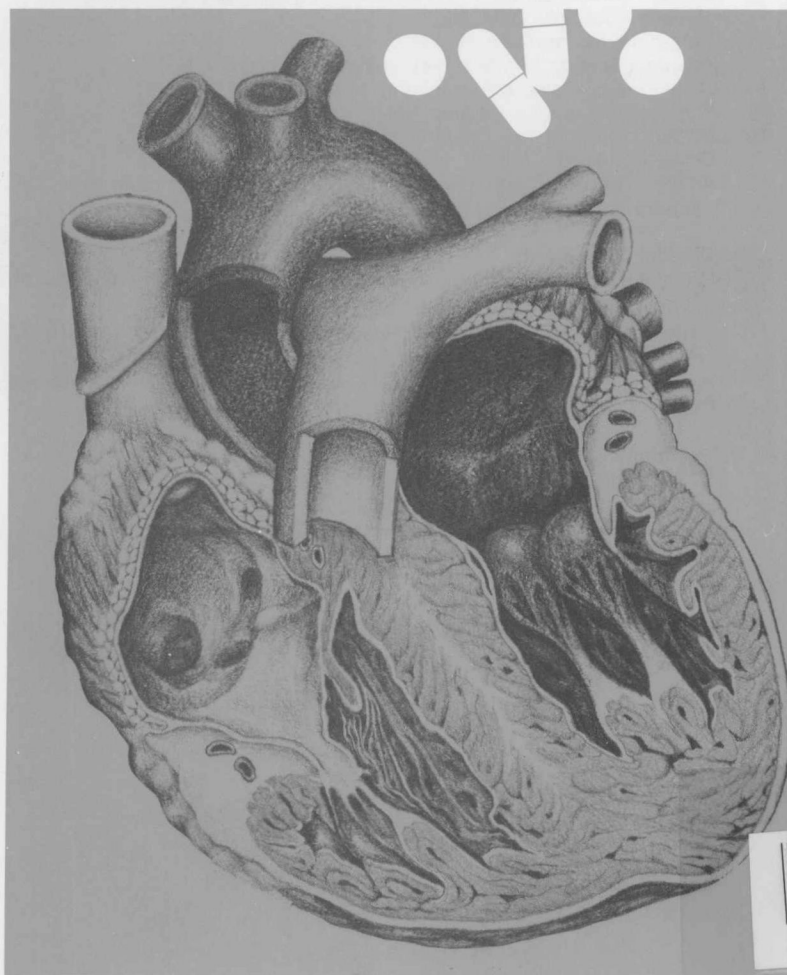


**NursingSkillbook™**

科技阅览室

# GIVING CARDIOVASCULAR DRUGS SAFELY

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#### **Guide to drug charts**

The symbol ◇ after a trade name indicates that the drug is also available in Canada.

The symbol ◇◇ means that the drug is available in Canada only.

Unmarked trade names mean that the drug is available only in the United States.

The symbol G stands for gram.

These symbols will be used in all the drug charts throughout the book.

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# FOREWORD

Why a book just about cardiovascular drugs, you may ask. Well, keeping current about all drugs is an ongoing challenge for all nurses. And surely, cardiovascular drugs are among the most paradoxical. Given correctly, these drugs can *save* lives. But given incorrectly — or unwisely — they can *take* lives. And many times, the nurse's knowledge is what determines the outcome.

But, are you involved with cardiovascular drugs? Probably you are, whether you realize it now or not. Because, according to the latest statistics from the American Heart Association, well over 29 million Americans have some form of heart or blood vessel disease. Moreover, cardiovascular disease will be responsible for approximately 52% of all deaths this year. These figures attest to the problem's magnitude, and justify the millions of dollars spent annually on research for prevention or treatment.

That's one of the reasons this book is so valuable. It'll help you see how cardiovascular disease — and the drugs used to treat it — affect all nursing fields. Patients taking these drugs are everywhere — in the doctor's office, as well as on every floor of the hospital. Situations in which you must administer the drugs, or simply know how they work, are endless. A

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patient's life can literally depend on what you remember.

GIVING CARDIOVASCULAR DRUGS SAFELY will *help* you remember. Unlike many other nursing books, which have a preponderance of pharmacology, this Skillbook presents the major classes of drugs in language easy to understand. Most important, it tells you what you, as a *nurse*, should know about the drugs — so you can help the patient.

Besides the text, this Skillbook contains many handy reference guides: a dosage and side effects chart for each major class of drugs and — in most chapters — drug interaction charts. You'll also find onset-of-action graphs, pertinent EKG strips, blood data about drug toxicities, and a handy dosage calculator. Near the beginning of the book is a well-designed chart that will help you review drug actions on the autonomic nervous system. At the back of this Skillbook is a helpful glossary.

One of the finest — and most unique — features of this Skillbook, however, is its emphasis on patient teaching. What to tell the patient about his therapy is discussed thoroughly in every chapter, of course. But additional teaching tools are added: easy-to-understand patient teaching cards for commonly prescribed drugs, and helpful diets and food charts that may be needed to accompany the drugs. *All of these may be reproduced on your office or hospital copier and given to patients.*

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As I conclude my introduction to this unusual book on cardiovascular drugs, an old saying comes to mind: "When opportunity knocks, open the door." Before you is an opportunity — an opportunity to learn about current drug therapy for cardiovascular disease, to enhance patient care, and to develop self-confidence and professional pride. Make the most of it!

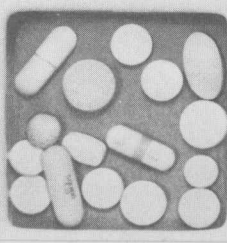
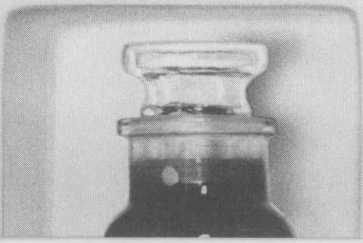
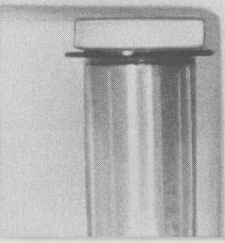
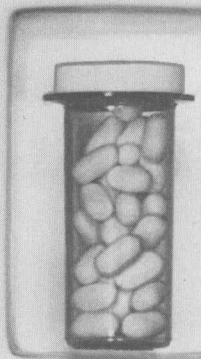
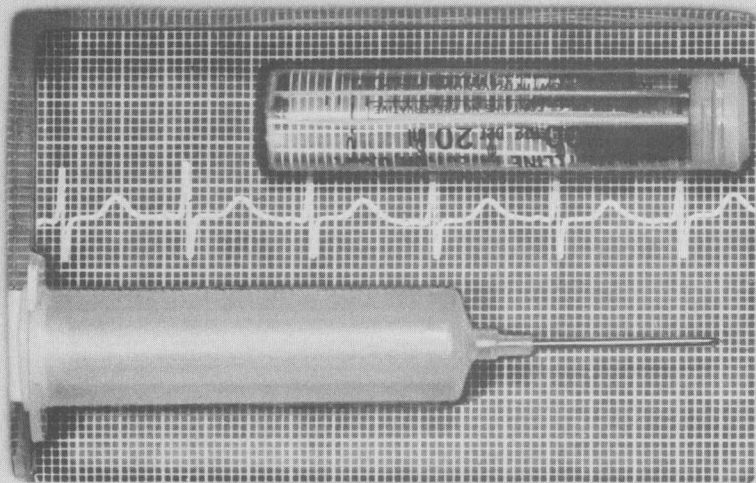
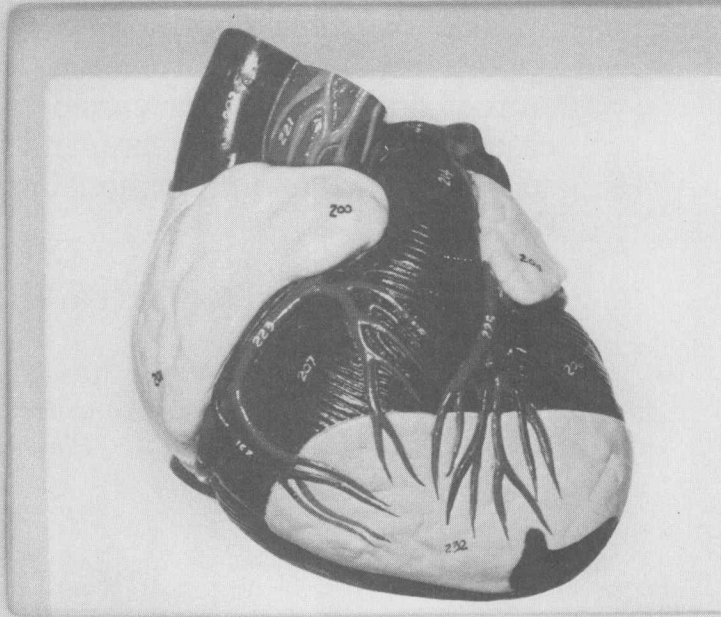
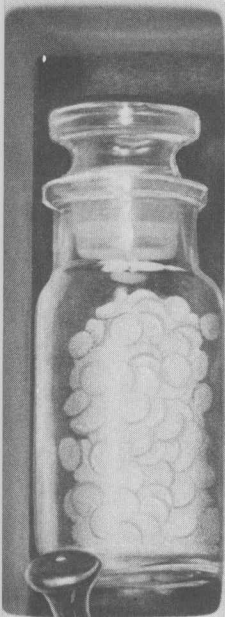
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*Director*

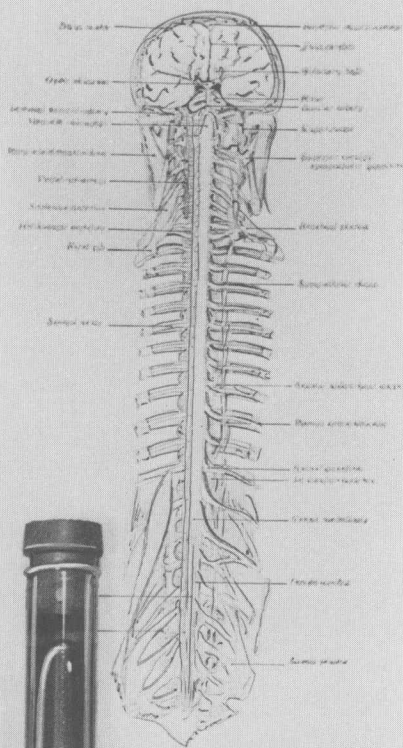
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# BEGIN WITH BASICS

Here's a brief, but comprehensive, review of the cardiovascular system and the ANS.





# 1

## THE CARDIOVASCULAR SYSTEM AND THE A.N.S.: Reviewing the basics

BY PAULA BRAMMER VETTER, RN, BSN

TO UNDERSTAND HOW cardiovascular drugs work, you need to know the cardiovascular system's workings — its anatomy and physiology. Dull stuff? Complicated? Yes, a little, but it's also fascinating.

Here's a brief description you really ought to review — even though you may have covered it in school. It'll help you better understand how certain drugs act on the cardiovascular system.

### **The body's pump**

The heart is an impeccably designed muscular pump connected to a "superhighway" transport system of blood vessels which traverse the entire body. Not only does this system circulate oxygen and nutrient-rich blood throughout the body, it also rids the body of waste materials.

The heart is enclosed in a fibrous, protective sac — the pericardium. If you were to open the pericardium, you'd see the shiny red membranous surface of the heart; this surface is the epicardium. It covers the heart muscle and supports it. Strip away the epicardium, and you'd see the myocardium; this is the heart muscle that does the pumping. On the heart's

interior surface, lining the chambers and covering valves and associated structures, lies a shiny, endothelial membrane called the endocardium. The endocardium provides a smooth, non-traumatic surface for the blood to pass over as it circulates through the heart. If the endocardium becomes scarred or rough, it can break down fragile blood platelets passing over it and increase the chance of clotting.

In normal adults, the heart is approximately 5 inches long, about 3½ inches in diameter at its widest point, and weighs between 250 and 300 grams. It's located substernally just about in the mid-line with its apex pointing left. The heart, which is divided into four chambers (two atria and two ventricles), is also rotated slightly so that the right ventricle lies in front of the left ventricle. From the front, you regard the right ventricle as the anterior ventricle and the left ventricle as the posterior.

The thin-walled atria serve as reservoirs and booster pumps to increase blood volume in the ventricles, which fill primarily by gravity. Blood rushes into the ventricles from the atria when the valves between them open: the tricuspid valve separating the right atrium from the right ventricle, and the mitral valve separating the left atrium. Then, a fraction of a second before the ventricles contract, the atria squeeze still more blood — another 20% — into the ventricles' chambers. This "atrial kick," as it is called, contributes significantly to the stroke volume (the amount of blood ejected from the ventricles with each systole).

### **The heart: two pumps in one**

To understand the heart's function, divide it into two segments:

- a low-pressure pump (right atrium and ventricle)
- a high-pressure pump (left atrium and ventricle)

Here's how the right-sided, low-pressure pump supplies the pulmonary vasculature. The right atrium receives venous blood from the systemic circulation via the superior and inferior vena cavae. This deoxygenated blood then flows across the tricuspid valve into the right ventricle.

There, it gets ejected with ventricular systole through the pulmonary outflow tract and into the pulmonary artery. Because the pulmonary arterial system is a *low-pressure* system with a mean pressure of approximately 15mm of mercury, it