Pharmacological treatment of heart failure

①

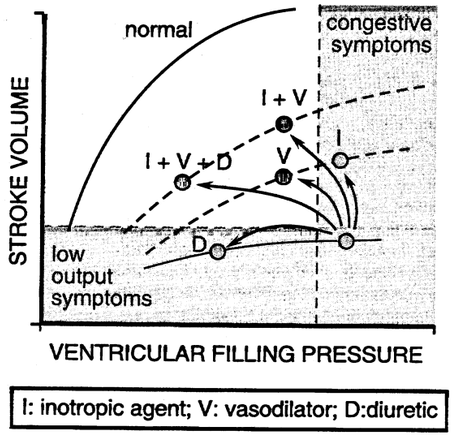

Figure 34–2. Physiological response to pharmacological interventions in heart failure.

②

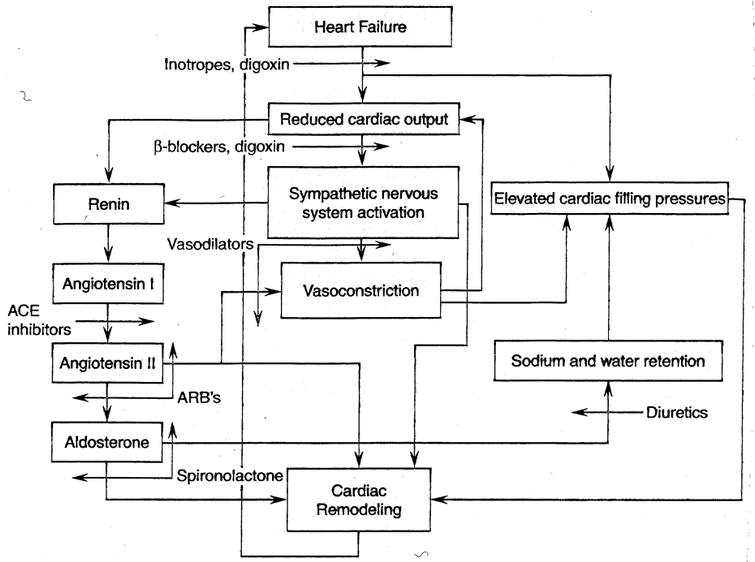

Figure 34–1. Pathophysiological mechanisms of heart failure and major sites of drug action.

③

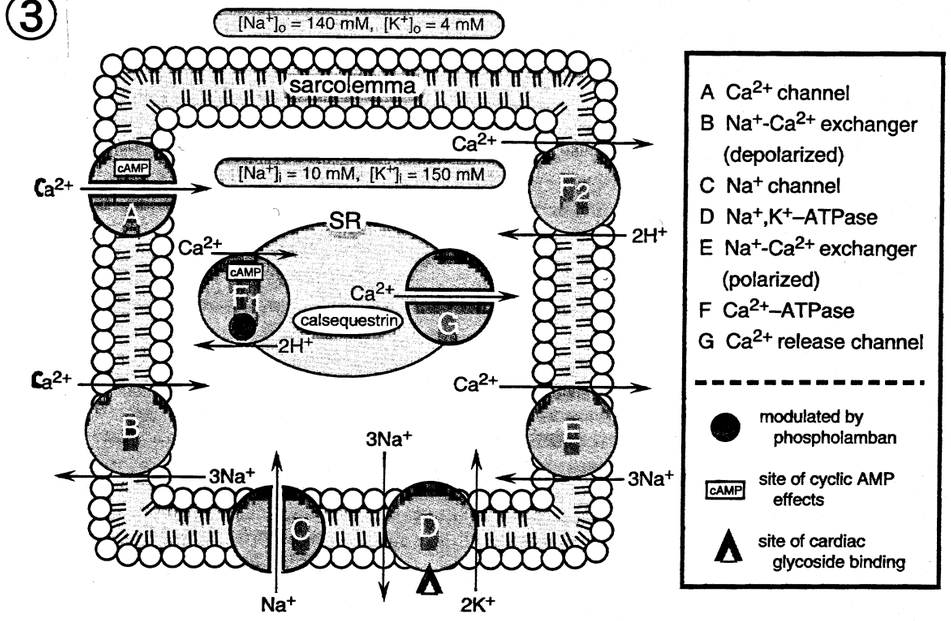

Figure 34–3. Sarcolemmal exchange of Na^+ and Ca^{2+} during cell depolarization and repolarization.

④

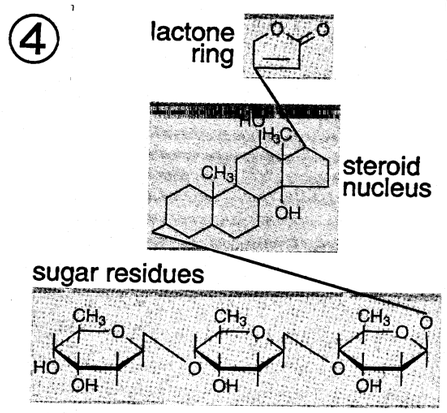

Figure 34–1. Structure of digoxin.

⑤

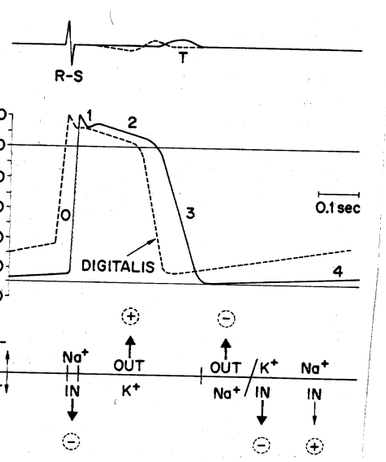

Figure 31–4. *Effects of digitalis on subsidiary pacemaker activity.*

⑥

Table 31–3. AVERAGE PHARMACOKINETIC VALUES AND DOSES FOR CARDIAC GLYCOSIDES

	DIGITOXIN	DIGOXIN	DESLANOSIDE	OUABAIN
Gastrointestinal absorption	90–100%	60–85%	Unreliable	Unreliable
Onset of action *	½–2 hr	15–30 min	10–30 min	5–10 min
Peak effect *	4–12 hr	1–5 hr	1–2 hr	½–2 hr
Plasma concentration, ng/ml				
Therapeutic	14–26	0.8–1.6		
Toxic	> 34	> 2.4		
Plasma half-life *	5–7 days	36 hr	36 hr	21 hr
Excretory pathway	Hepatic → Renal	Renal	Renal	Renal
Total digitalizing dose (adult) †				
Oral	1.2–1.6 mg ‡	2.0–3.0 mg §		
Intravenous	1.2–1.6 mg ‡	0.75–1.5 mg ¶	1.2–1.6 mg #	0.25–0.5 mg **
Daily oral maintenance dose	0.05–0.2 mg	0.25–0.75 mg		

* All time values are based on intravenous administration of a single digitalizing dose.

† The values given represent *average* doses or ranges for complete digitalization; the requirements of *individual* patients may depart considerably from these figures. For the overwhelming majority of patients, only a fraction of the digitalizing dose should be given initially, followed by subsequent fractional doses at appropriate intervals, as indicated for the individual drugs. For complete discussion, *see* text.

⑦

⑧

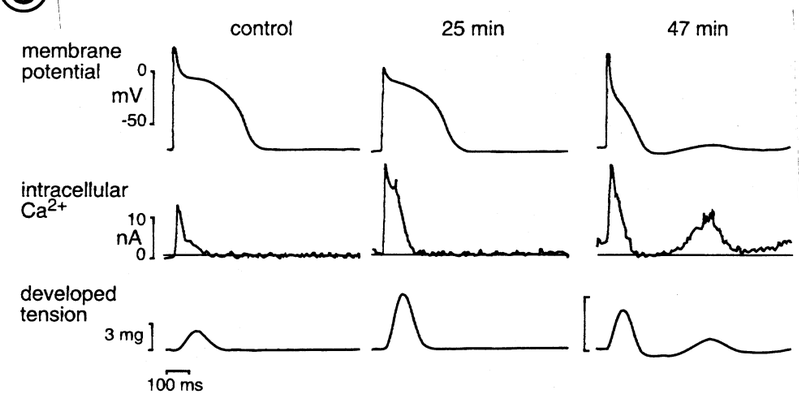

Figure 34–5. Role of intracellular calcium in mediating inotropic and toxic electrophysiological effects of cardiac glycosides.

⑨

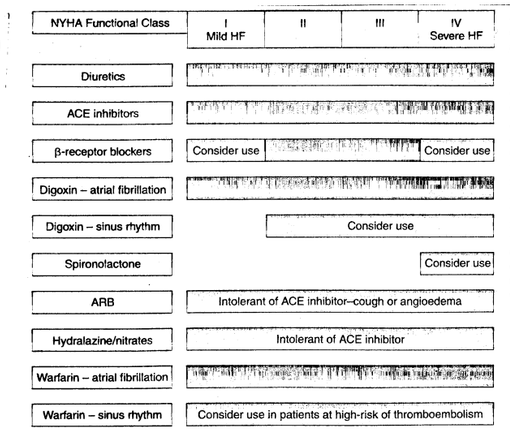

Figure 34–10. Guidelines for pharmacological management of ambulatory patients with heart failure.

As the number of options for the drug therapy of heart failure increases, it has become more important to determine, based in most cases on evidence from clinical trials, the optimal usage of these drugs. Shown are recommendations for the pharmacological management of left ventricular systolic dysfunction as formulated by the Heart Failure Society of America. Blue boxes represent groups in which drugs should be routinely administered. Gray boxes represent groups in whom drug use should be considered. (ACE inhibitor = angiotensin-converting enzyme inhibitor; ARB = angiotensin receptor blocker; HF = heart failure) (Adapted from Heart Failure Society of America, 1999, with permission.)