
بسم الله الرحمن الرحيم

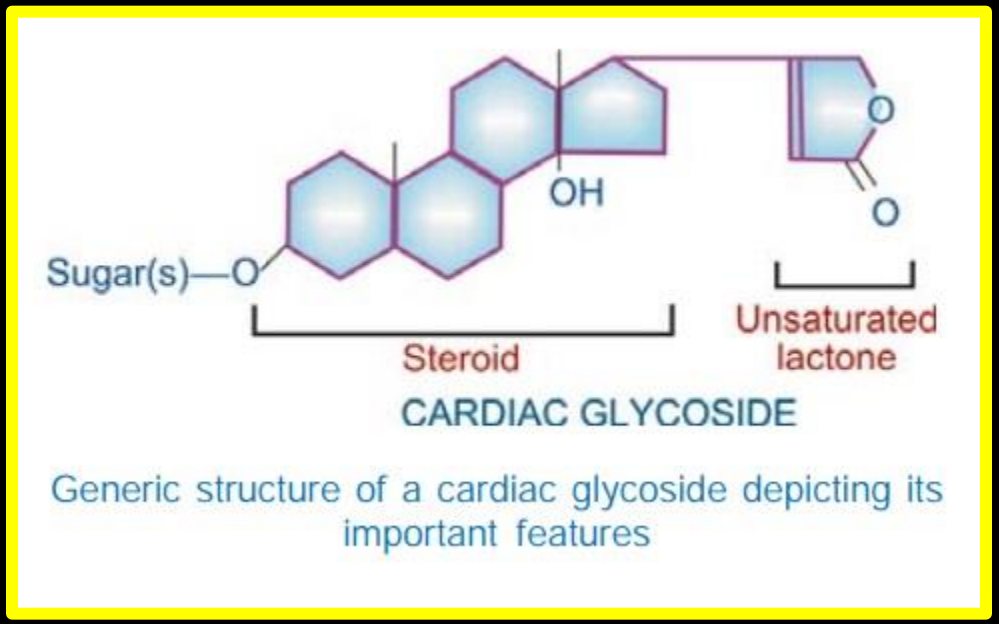
CARDIAC-GLYCOSIDES

OUTLINES

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2) What is digoxin
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4) Therapeutic range
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CARDIAC-GLYCOSIDES

- CARDIAC: relating to the heart.
- GLYCOSIDES: are organic molecules that can be isolated from plant or animal sources.



Generic structure of a cardiac glycoside depicting its important features

DIGOXIN

The most commonly used cardiac glycoside is digoxin.



MAIN SOURCE OF DIGOXIN

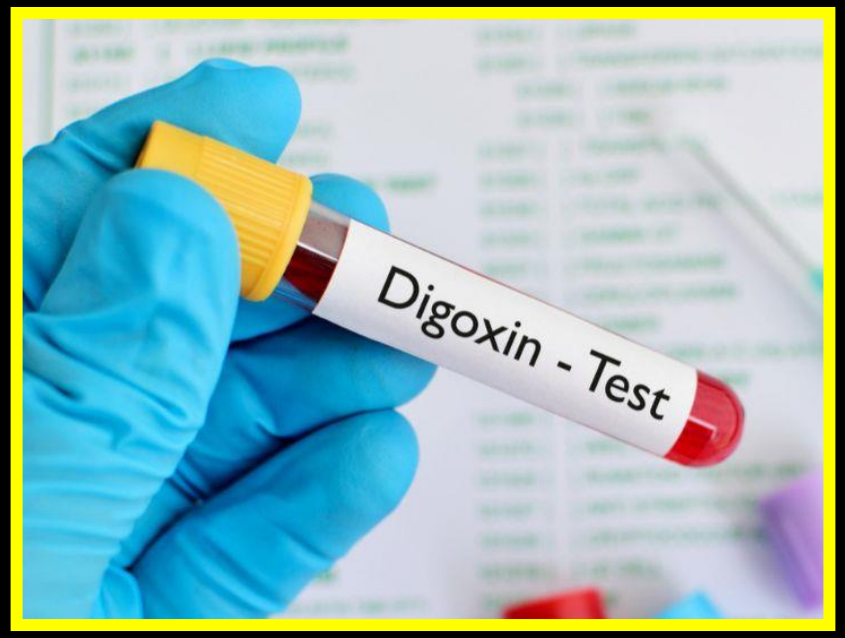


COMMON NAME : FOXGLOVE

SCIENTIFIC NAME: DIGITALIS LANATA

THERAPEUTIC RANGE

The general therapeutic range for digoxin is 0.5-2.0 ng/mL.
The toxic level is >2.0 ng/mL.



DOSAGE FORMS OF DIGOXIN

Digoxin is available as brand Lanoxin and generic digoxin in the following dosage forms.

- 62.5 mcg (.0625 mg) **oral tablets**
- 125 mcg (0.125 mg) **oral tablets**
- 250 mcg (0.25 mg) **oral tablets**
- 50 mcg (0.05 mg)/mL **oral solution**
- Digoxin is also available **in injectable forms**.

WHAT IS DIGOXIN

- Digoxin is a cardiac glycoside medication
- It has **three effects** on **heart muscle**:
- POSITIVE INOTROPIC ACTION: increases contractility, stroke volume, and cardiac output.
- **NEGATIVE CHRONOTROPIC ACTION:** decreases heart rate.
- **NEGATIVE DROMOTROPIC ACTION:** decrease conduction of cardiac cell

INDICATION OF DIGOXIN

- The drug is most useful in the treatment of
- Supraventricular tachycardias (svts)
- Control the ventricular rate in atrial fibrillation (AF)
- Treatment of heart failure

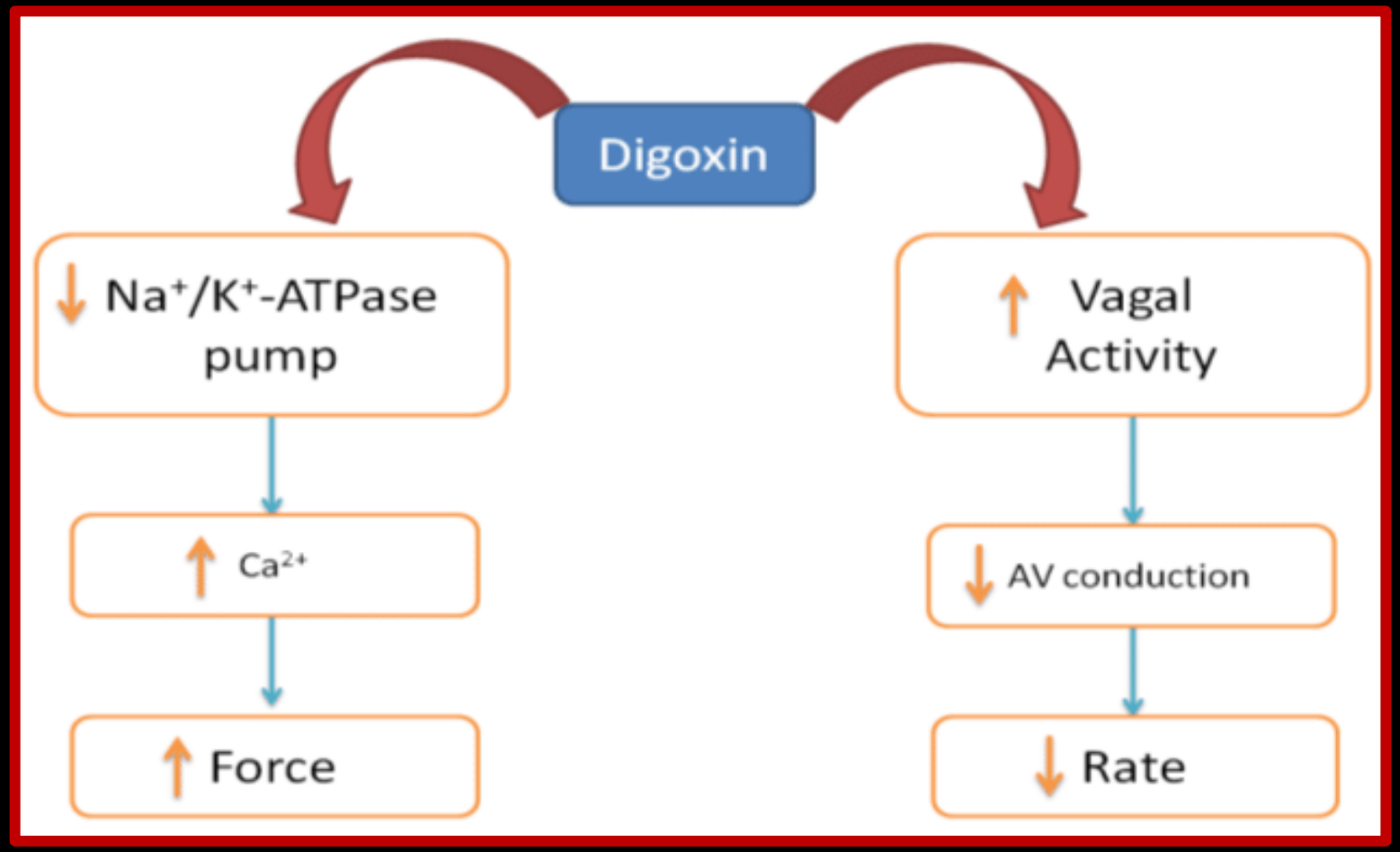


Contraindications

- Acute myocardial infarction.
- Hypersensitivity to the drug.
- Ventricular fibrillation.
- Myocarditis.
- Hypomagnesemia.
- Hypokalemia.
- Wolf-Parkinson-White syndrome.

MECHANISM OF ACTION

THERAPEUTIC EFFECTS:

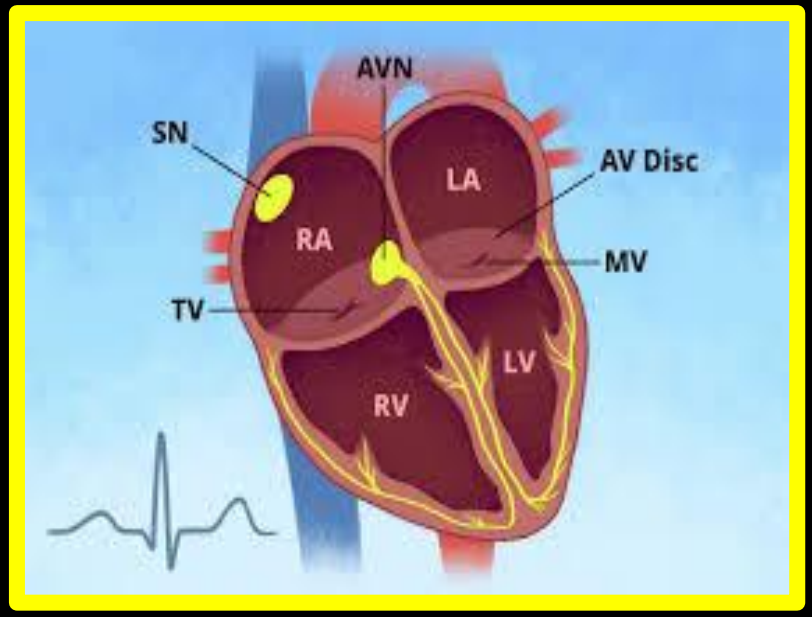


MECHANISM OF ACTION

The slowing of cardiac rate and rhythm are attributed to digoxin's impact on the central nervous system (CNS) which leads to increased vagal activity resulting in slowed conduction in the atrioventricular (AV) node.

In AF, it slows the ventricular rate largely by

- ↓ The sympathetic drive
- ↓ Conduction across the atrioventricular (AV)node.
- ↑ The force of contraction and provides inotropic support.

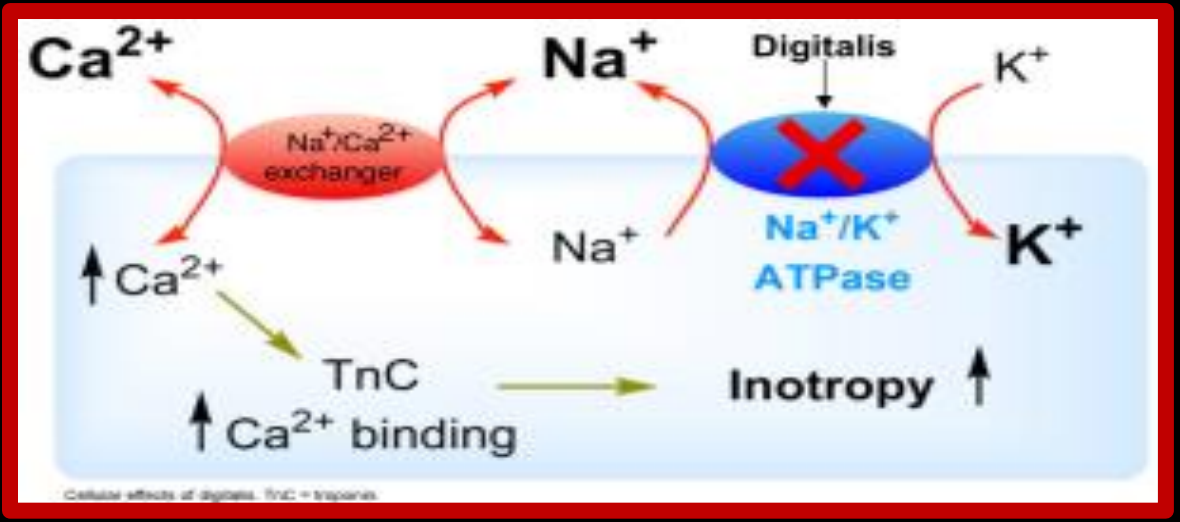


Inhibition of the Na*/K*/ATPase pump

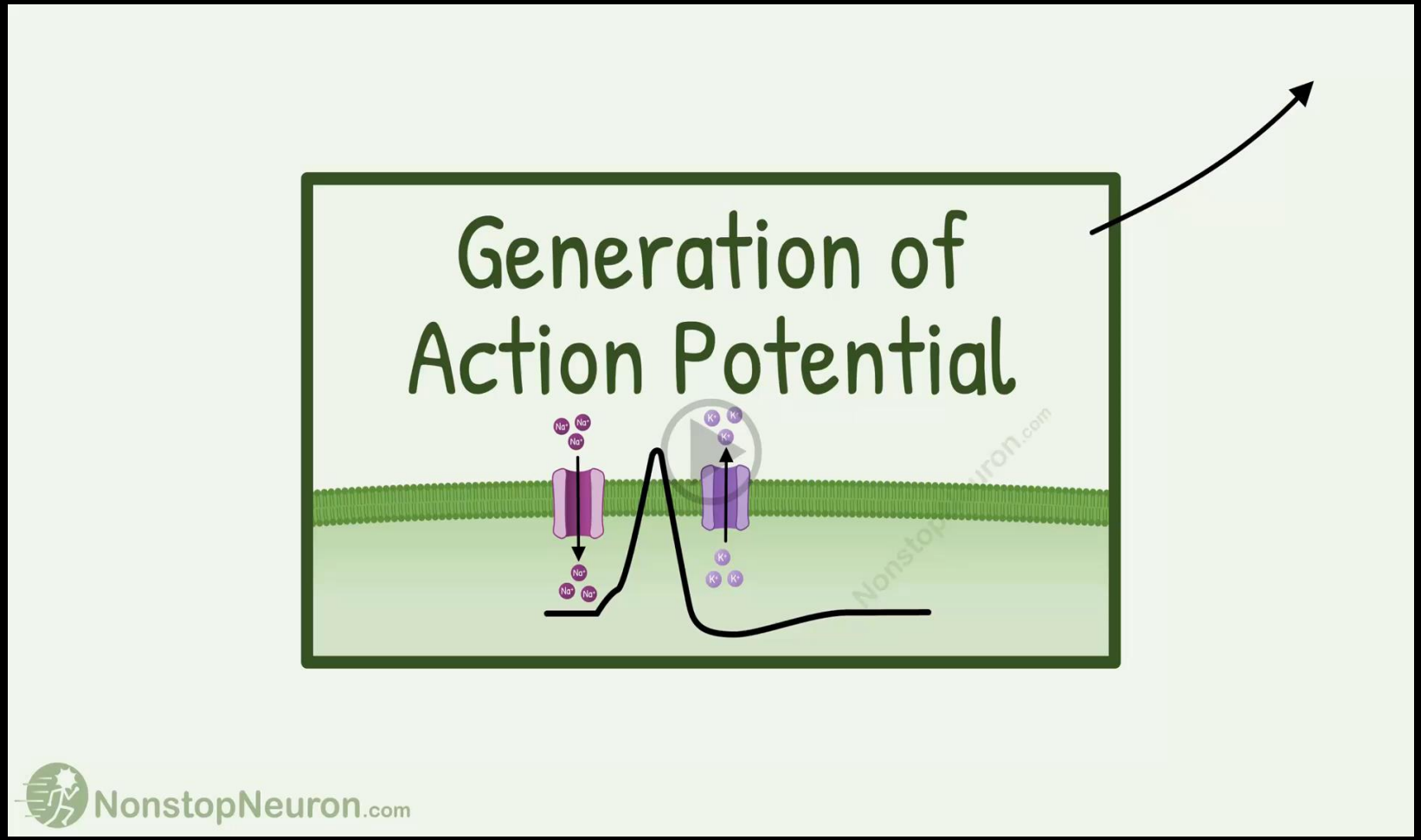
Inhibition of the Na*/K*/ATPase pump on the cell membranes of cardiac myocytes results in ↑intracellular sodium.

This ↑ **in** intracellular sodium inhibits the sodium- calcium exchanger, and thus ↓ the efflux of calcium ions, resulting in an ↑ in intracellular calcium.

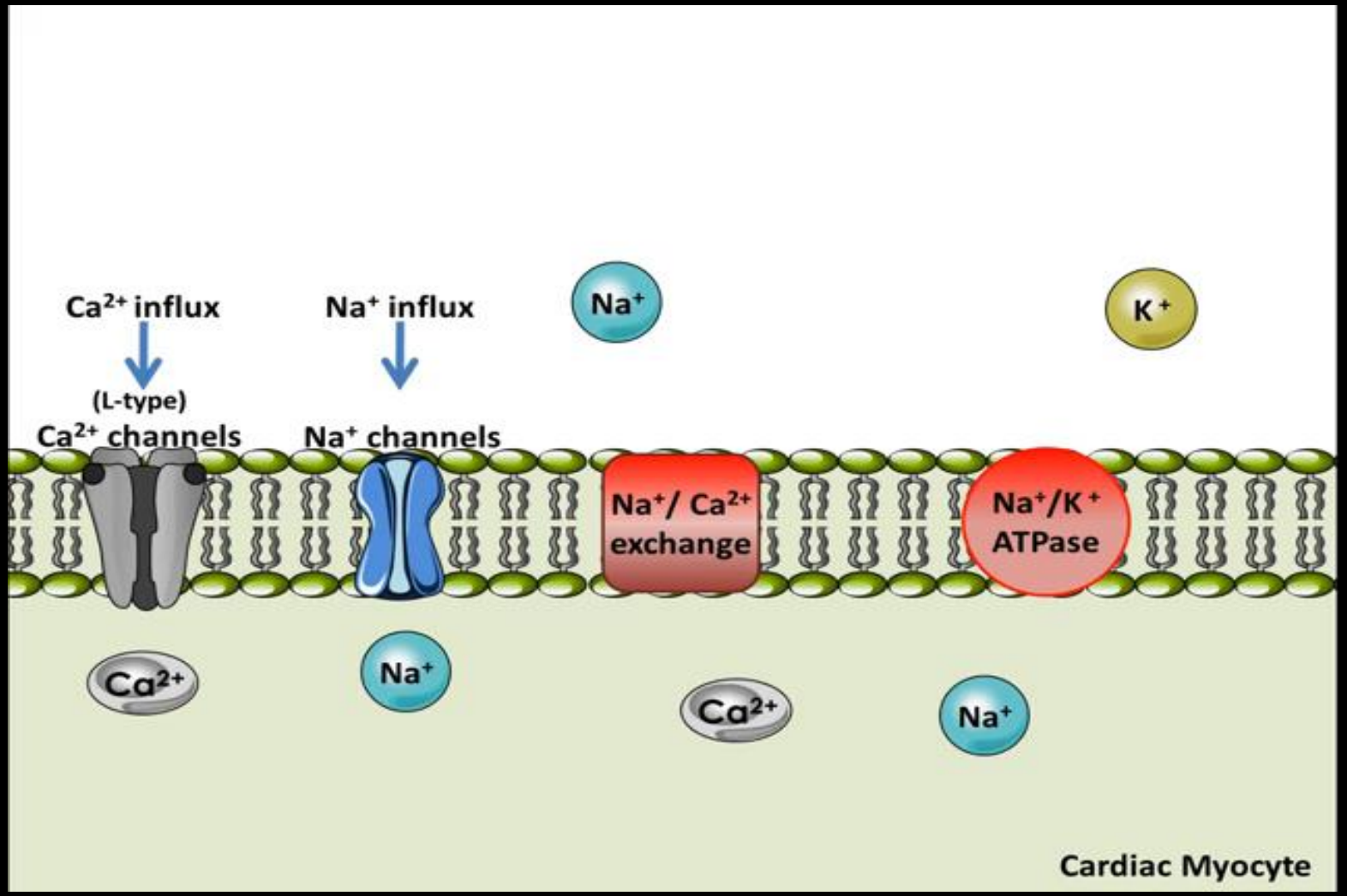
↑ intracellular calcium results in ↑ contractility.



ACTION POTENTIAL

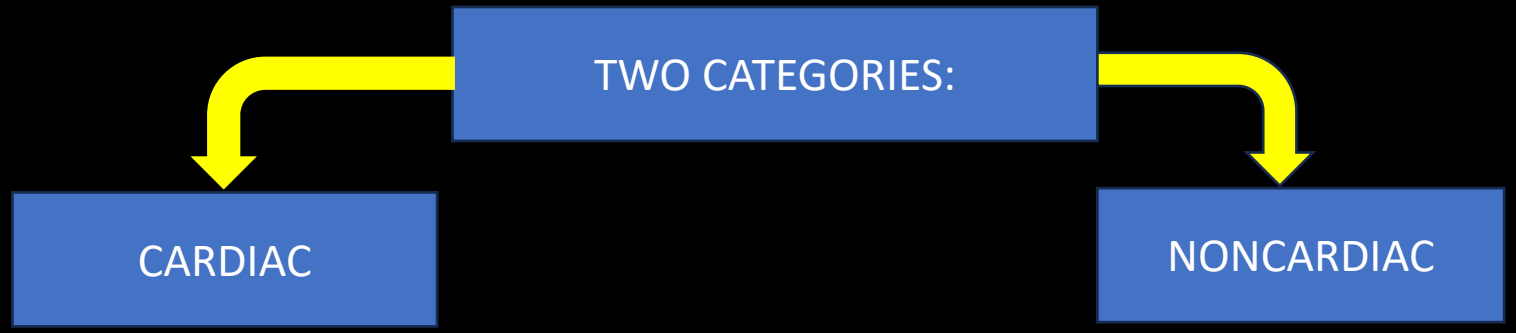


MECHANISM OF ACTION



NURSING CONSIDERATIONS

Patient must be monitor for side effects



- BRADYCARDIA
- HEART BLOCK
- VENTRICULAR ARRHYTHMIAS

- ANOREXIA
- NAUSEA
- VOMITING
- DIARRHOEA
- HEADACHES
- DROWSINESS
- CONFUSION
- VISUAL DISTURBANCES

Cont..

- Assess apical heart rate for 1 minute
- Monitoring of blood potassium levels is very important because
- Hypokalaemia can **increase** the chance of digoxin toxicity.
- Digoxin might need to be stopped before cardiac surgery to the risk of arrhythmias or bradycardia postoperatively.

CAUSE OF DIGOXIN TOXICITY

Hypokalemia: The most common trigger of digoxin toxicity is hypokalemia, which may occur as a result of diuretic therapy

Hypercalcemia: Digoxin enhances Ca+2 absorption into cardiac myocytes, This can also lead to Ca+2 overload and increased susceptibility to digitalis-induced arrhythmias.

Hypomagnesemia: Can sensitize the heart to digitalis-induced arrhythmias (includes any arrhythmia except supraventricular tachydysrhythmias).

Hypokalemia Hypercalcemia Hypomagnesemia

Patient Teaching & Education

- Instructed to follow the prescribed dose.
- Pulse rate monitoring

REFERENCE

- https://open.umn.edu/opentextbooks/textbooks/875
- https://academic.oup.com/book/36995
- https://www.youtube.com/watch?v=Xm0vsJ8IU9c
- https://www.youtube.com/watch?v=VHbn7q16d4o&t=4s


THANK
YOU!