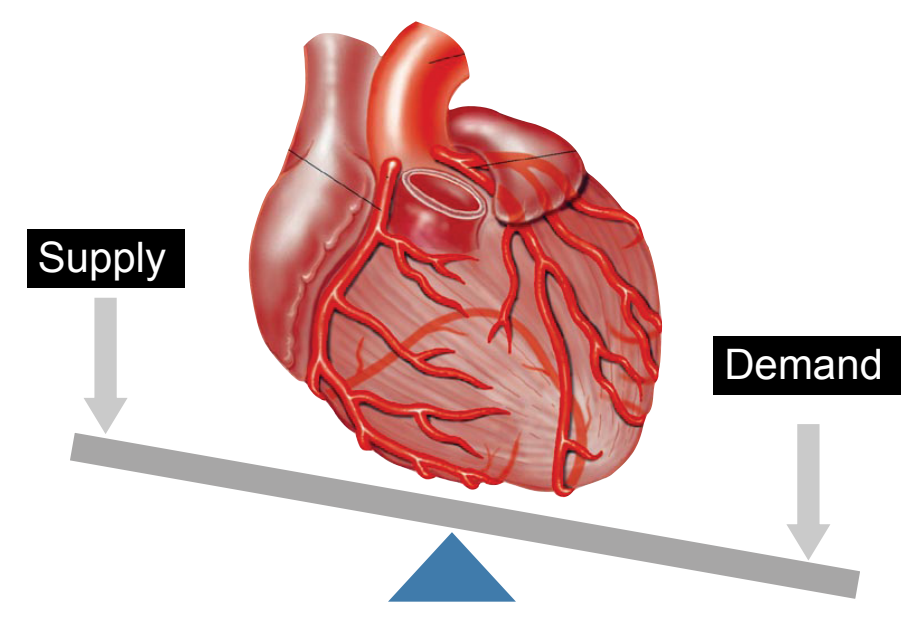


# Myocardial Ischemia

## Cardiac Ischemia

Imbalance between the blood supplied to the heart and its metabolic demand.



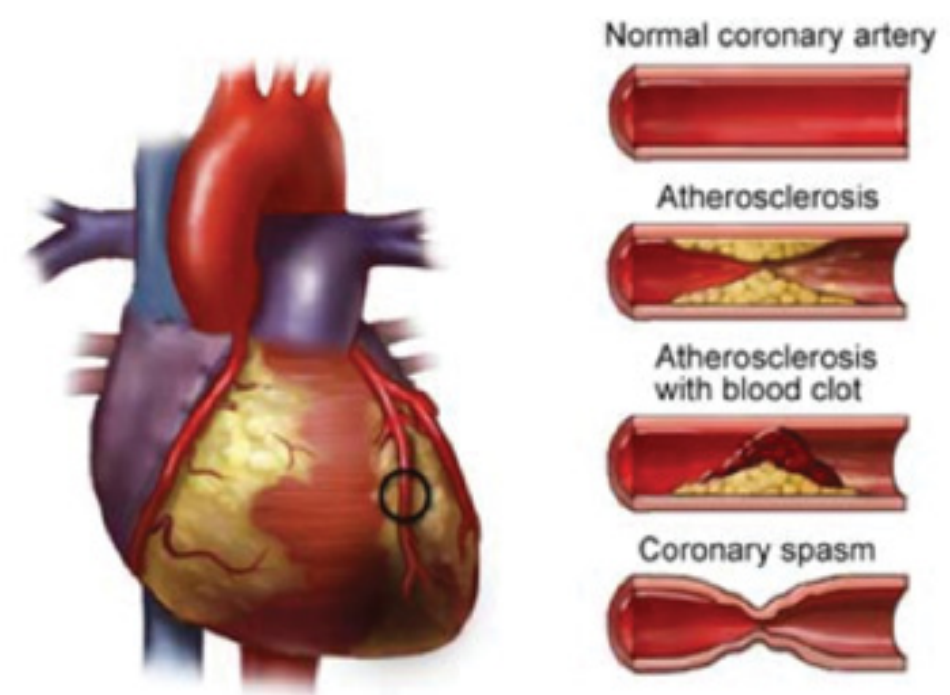
## Symptoms

- No symptoms (silent ischemia)
- Chest, neck, shoulder pain
- Shortness of breath
- Nausea and vomiting



## Causes

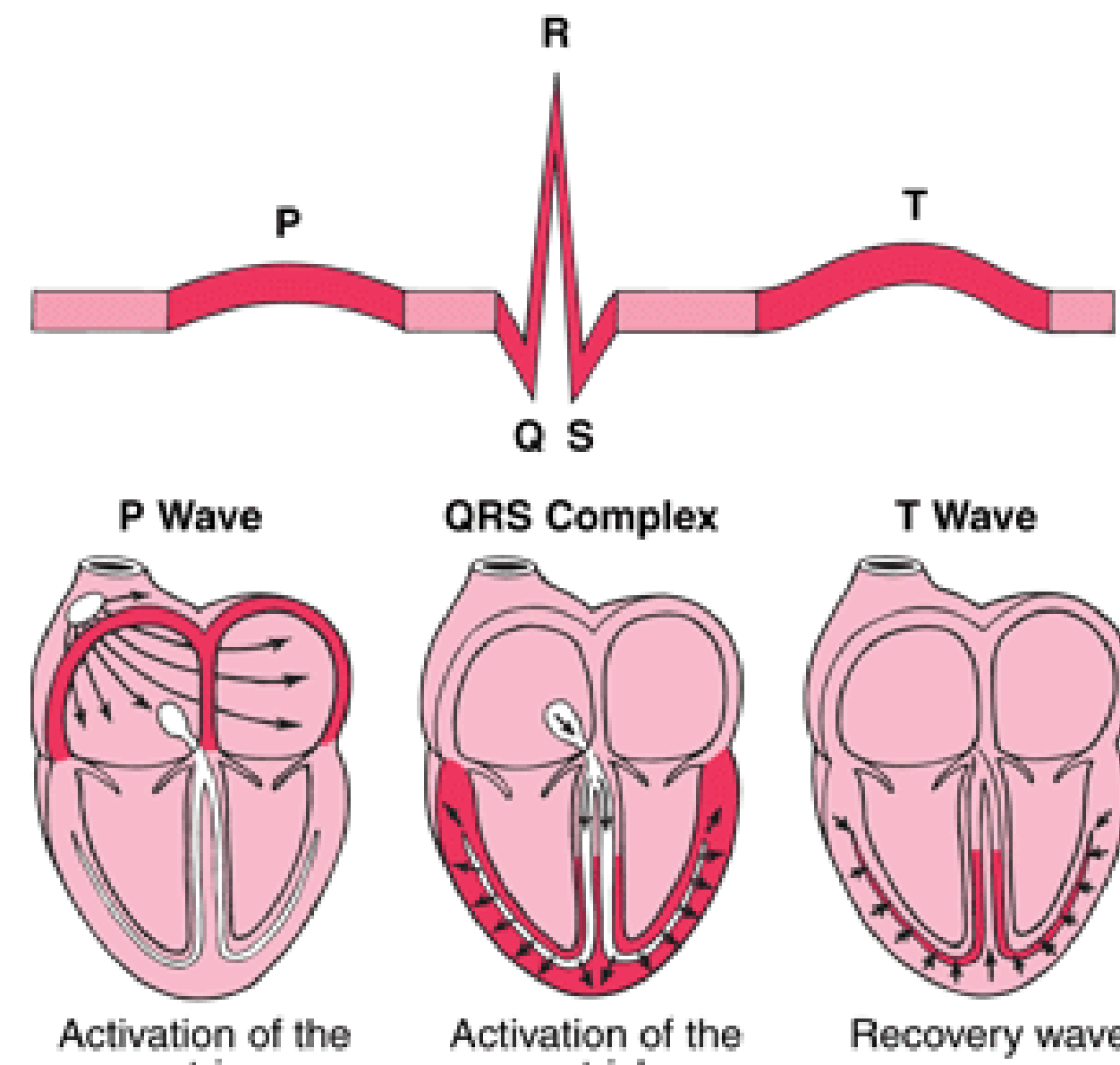
- Coronary artery disease (atherosclerosis)
- Blood clot (thrombosis)
- Arterial inflammation
- Coronary spasm



Coronary artery disease

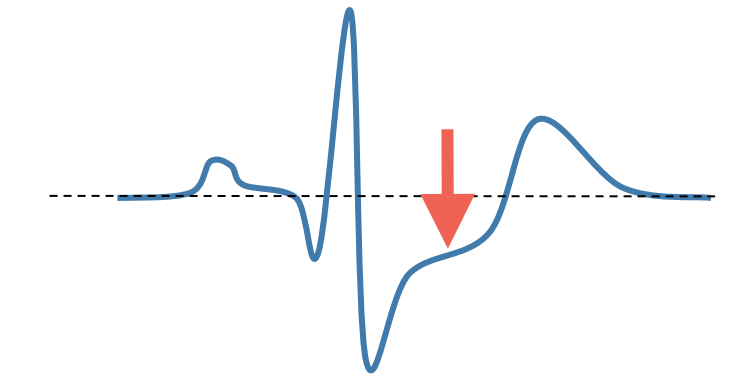
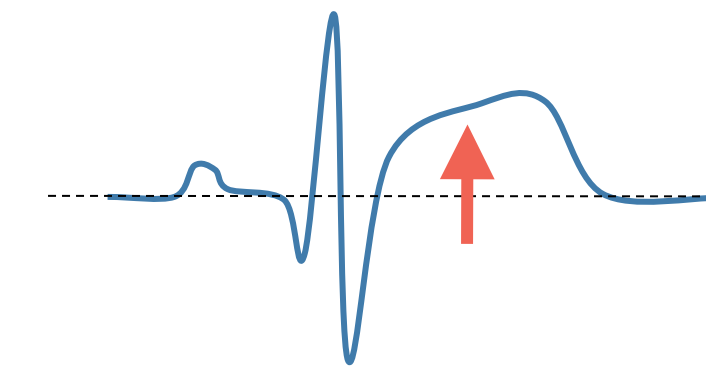
## Diagnosis

- Electrocardiogram (ECG), Exercise Testing (ET)
- Blood tests
- Echocardiogram
- Nuclear scan
- Coronary angiography
- Cardiac CT



ST elevation

ST depression



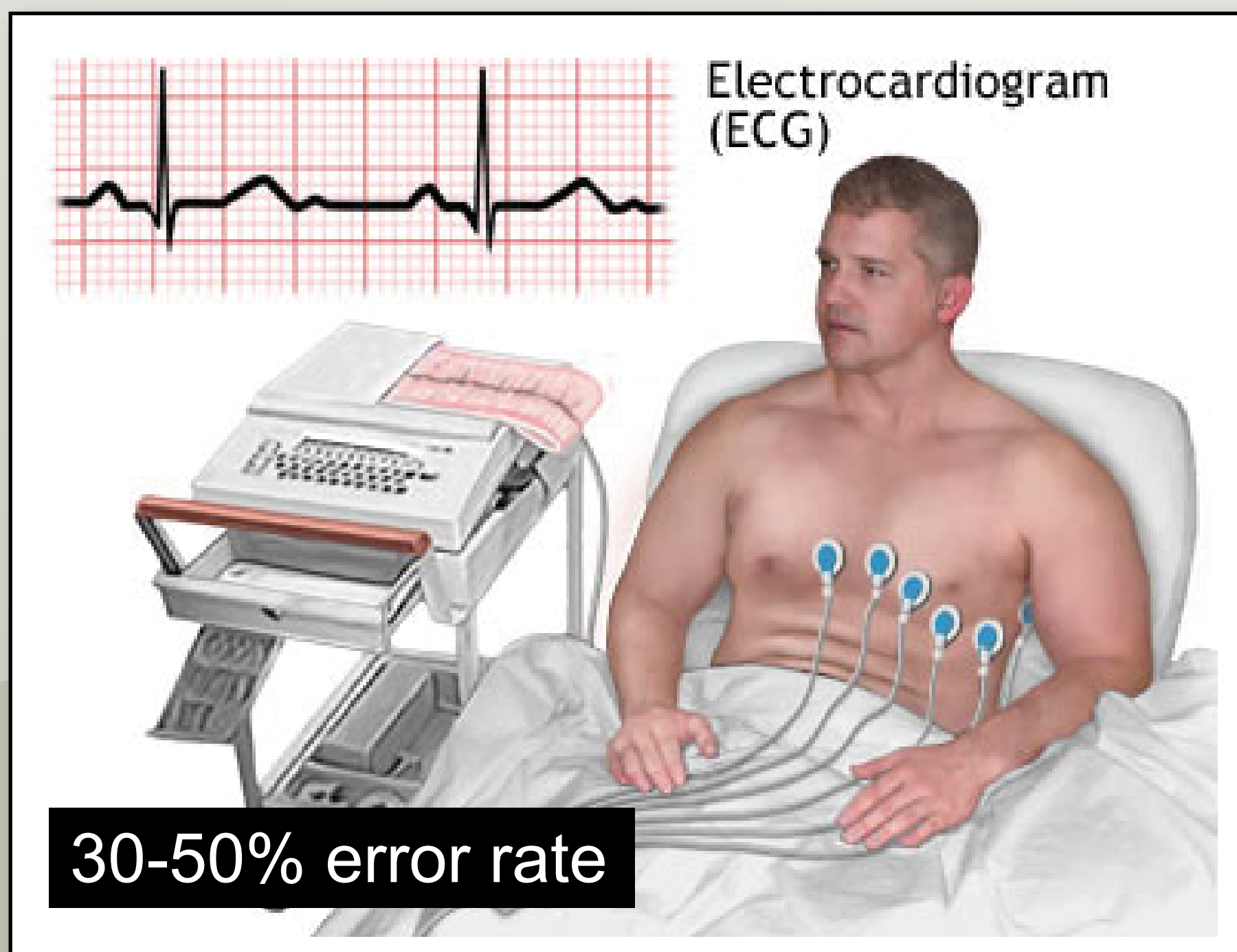
Transmural ischemia

Non-transmural ischemia

ECG based diagnosis of cardiac ischemia

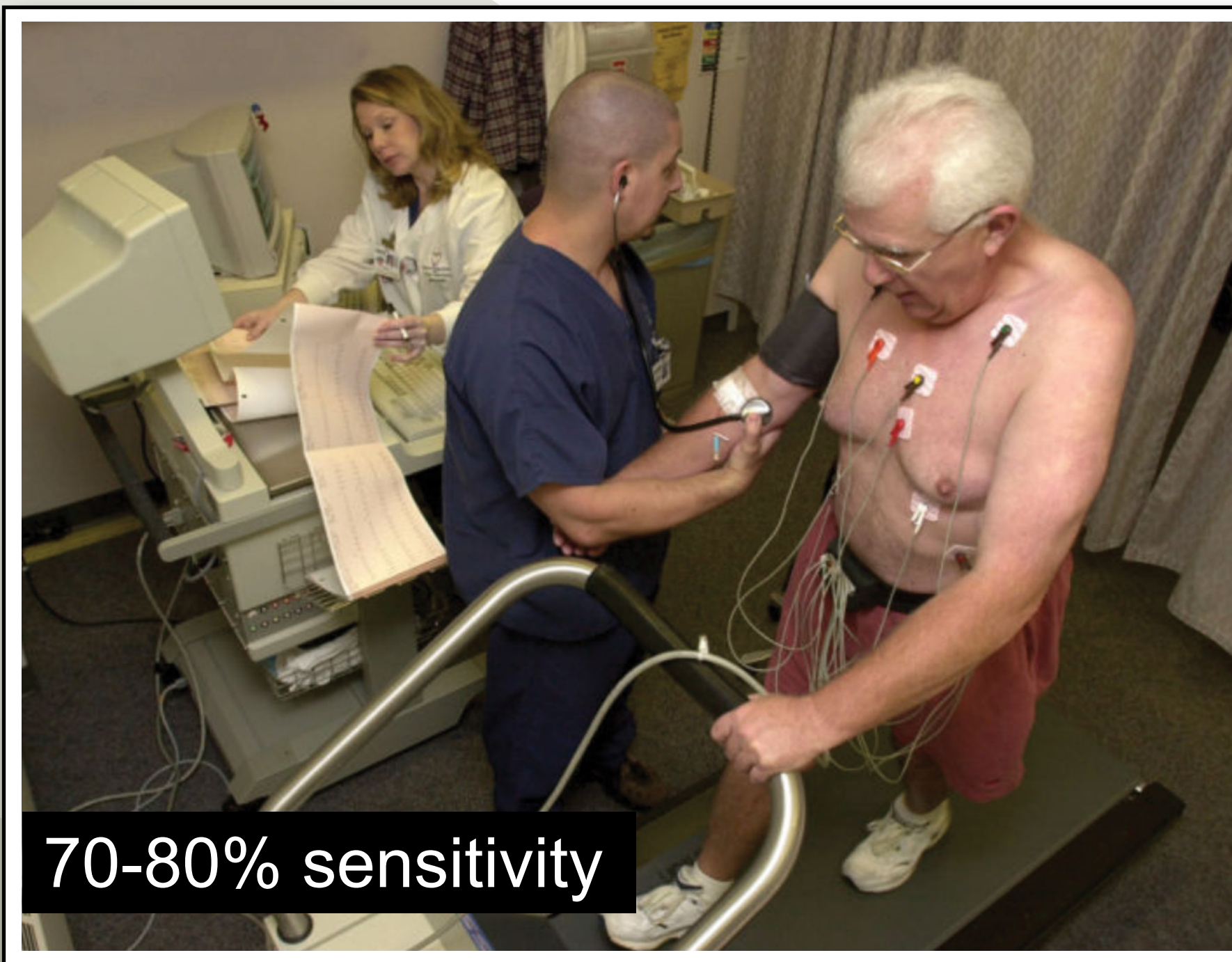
## Clinical Setting

- Diagnostic errors of 30-50%
- ECG is often normal or non-specific in patients with cardiac ischemia



30-50% error rate

Emergency Room (ER)

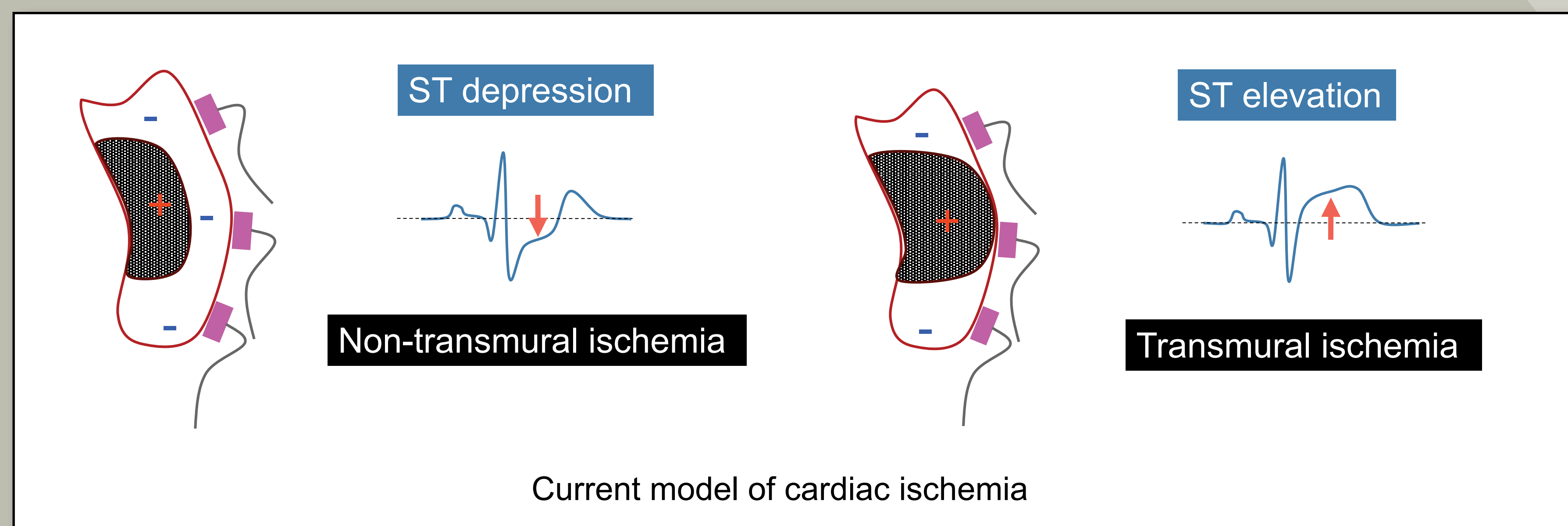


70-80% sensitivity

Exercise Testing (ET)

## Research Motivation

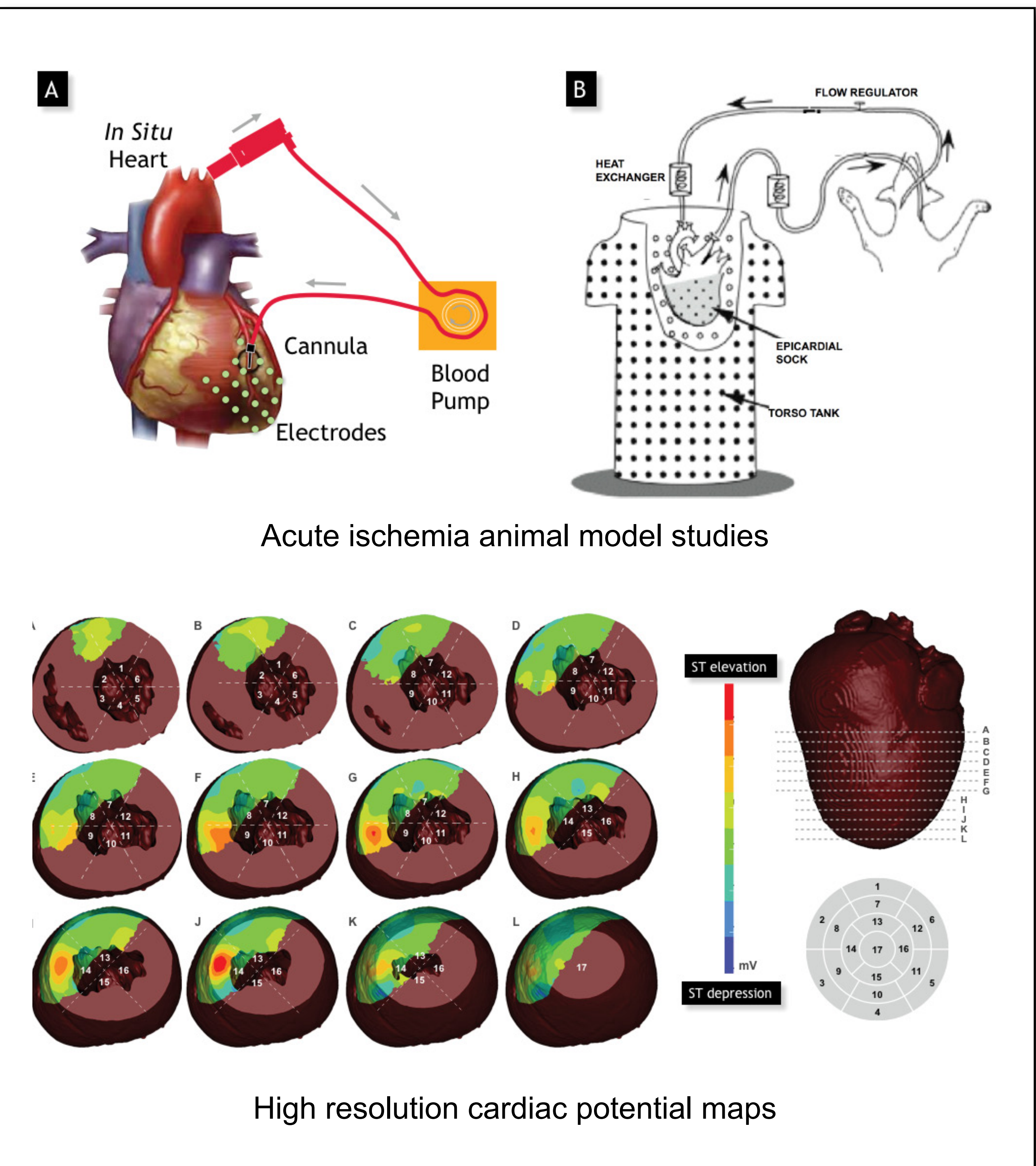
- Ischemia originates in the sub-endocardium and progresses uniformly towards the epicardium
- Current ischemia model does not explain the clinical and experimental results.
- Characterize the electrical signature of cardiac ischemia.



Current model of cardiac ischemia

## Research Overview

- Acute ischemia animal model studies using high resolution mapping of cardiac potentials.



Acute ischemia animal model studies

High resolution cardiac potential maps

