Membrane voltage and a traveling activation — review sheet

Use this after attempting the worked examples and practice. Explain each claim in words before calculating.

Key ideas

- Membrane voltage, activation maps and ECG recordings are different objects.
- Cell-specific currents and recovery matter; a neuronal analogy is not a cardiac model.
- Constant-speed arrival time is distance divided by speed.
- A prescribed delay translates a shape but does not solve tissue dynamics.
- A 3D rendering does not establish 3D physiological detail.

Common errors and repairs

The electrical wave is blood moving through the tissue. It is sequential excitation of coupled cells, not bulk blood transport.

A delayed local trace is automatically an ECG lead. An ECG requires a different observation model involving distributed activity and the body.

Retrieve without your notes

- Convert 0.4 mm/ms to m/s.
- What evidence could assess the constant-speed assumption?

Readiness check

- Distinguish membrane voltage at one cell from a spatial activation pattern and an ECG.
- Explain qualitatively how regulated ion movement supports excitation and recovery.
- Calculate arrival time from distance and a specified conduction speed with consistent units.
- Interpret a space-time plot and a 3D activation view without claiming that a prescribed wave solves tissue dynamics.