33.59. **Model:** Assume the field is constant over the cross section of the patient.
Visualize: The changing field results in a changing flux and an induced emf.
Solve: To determine the largest emf, assume the normal to the surface is parallel to the field . From Faraday's law, the emf is

$$\mathcal{E} = \left|\frac{d\Phi}{dt}\right| = \left|\frac{d}{dt}AB\right| = A\left|\frac{dB}{dt}\right| = A\left|\frac{\Delta B}{\Delta t}\right|$$

The time interval acceptable for the change is

$$\Delta t = A\frac{|\Delta B|}{\mathcal{E}} = \frac{\left(0.060\ \text{m}^2\right)|5.0\ \text{T} - 0\ \text{T}|}{0.10\ \text{V}} = 3.0\ \text{s}$$

Assess: This is a reasonable amount of time in which to change the field.