I am a resistor of 10 kΩ and I wish I had paid more attention in Phys 231 class.

> 14 kV power supply!!

(a) What is I through you? (Hope not)

\[ V = IR \Rightarrow I = \frac{V}{R} \]

\[ I = \frac{14 \text{ kV}}{(10 \text{ kΩ} + 2 \text{ MΩ})} \]

resistors in series
(you + internal resistance)

\[ I = 1.17 \text{ A} \]

(b) What is power dissipated in your body?

\[ P = I^2 R = (1.17 \text{ A})^2 (10 \text{ kΩ}) \]

\[ P = 13.7 \text{ kW} \]

Ouch!

(c) Can make this safer by increasing internal resistance.

Lethal shocks are about 100 mA so let's make max current 10 mA or less.

\[ V = IR \Rightarrow R = \frac{V}{I} \Rightarrow R + R_{\text{human}} = \frac{V}{I_{\text{max}}} \]

\[ R + R_{\text{human}} = \frac{14,000 \text{ V}}{0.001 \text{ A}} = 14 \times 10^6 \text{ Ω} = 14 \text{ MΩ} \]

Since \( R_{\text{human}} = 10 \text{ kΩ} \)

\[ R = 14 \text{ MΩ} - 10 \text{ kΩ} \]

\[ 14 \text{ million} - 10 \text{ thousand} \]