https://van.physics.illinois.edu/qa/listing.php?id=6793

please tell value of human body resistance
- thiru (age 21)
india

Thiru -

There are a lot of factors involved and not every person has the same electrical resistance. For instance, men tend to have lower resistance than women. Just like for the resistors used in electronics, the resistance of a person's arm depends on the arm's length and diameter. Resistance goes up with length and down with diameter. Since men tend to have thicker arms and legs (more muscle), they usually have lower resistance. (An implication of this is that .) A rough value for the *internal* resistance of the human body is 300-1,000 Ohms. Naturally, the resistance also depends on the path that electricity takes through the body - if the electricity goes in the left hand and out the right foot, then the resistance will be much higher than if it goes in and out of adjacent fingers.

Within the body, the tissues with the greatest resistance are bone and fat - nerves and muscle have the least resistance. That said, the majority of the body's resistance is in the skin - the dead, dry cells of the epidermis (the skin's outer layer) are very poor conductors. Depending on the person, the resistance of *dry skin* is usually between 1,000-100,000 Ohms. The skin's resistance is much lower if it is wet or burnt/blistered. This means that when a person is electrocuted in real life, the body's resistance drops as the skin is burned. To determine a person's total resistance, just add together the resistance of each part of the body - remember that the electricity must pass through the skin twice (on the way in and on the way out), so the total resistance is:

$$R_{total} = R_{skin}(in) + R_{internal} + R_{skin}(out)$$

Another interesting point to consider is that in addition to acting like a resistor, the epidermis acts like a capacitor if placed in contact with a piece of metal (the underlying tissue is like one plate of a capacitor and the metal surface is like the other plate - the dry epidermis is the less-conductive material or "dielectric" in between) . In cases of electrocution by a DC voltage source, this capacitive property has little importance. But if the electrocution is by an AC source, the epidermis's natural resistance is "shorted out", allowing the current to bypass that part of the body's resistance and making the body's total resistance much lower.

-Tamara