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Tomy
Neuro 430
Model Plan

Title: Sense of Touch

Purpose: to demonstrate stretch receptors and how it causes sodium ions to open when something touches the skin that will ultimately send a signal to the brain. Also, stronger stimulus leads to a greater chance of signaling.

Materials: One PVC, one towel, one large bungee cord, two metal boards, two small blocks of wood, one large peg board, one rubber band, two nails, two hook screws, 5 golf balls, screws, and a large face model.

Procedure: Make a sagittal cut through the PVC pipe. Attach one half of the PVC pipe to the peg board so that it lies with the open groove facing up using screws. At the tip of the PVC pipe, connect two blocks of wood to the peg board so that it forms a V shape. To the lateral sides of the new V-shape complex, connect two hook screws. Use one rubber band to connect the two hook screws together. Next, connect the two metal bars to the peg board. Wrap the bungee cord around the bars and connect the ends of the bungee cord to the hook screws. Attach the towel to the bars so that it forms a sheet in front of the bungee cord. Place 5 golf balls at the tip of the PVC pipe right before the V-shape complex. At the end of the PVC pipe, place the face model. Incline the board.

Have kids push on the towel and watch as the bungee cord stretches (stretch receptors). As the bungee cord stretches, it opens the V-shape complex (sodium channel). This allows for the golf balls (sodium ions) to flow down the PVC pipe. The golf balls will then roll down and hit the face at the base of the model (signaling to the person that something is touching the skin). Kids will see that the harder you press on the towel, the more signaling occurs. If you push on the towel lightly, only a little amount of golf balls flow through the channel, if any, and the person will not know something is touching him.

Issues: Sodium ions cause membrane to depolarize; it does not transmit the information to the brain. Certain touch receptors are phasic receptors. With phasic receptors, there is an on and off response that causes the brain to not know the duration of the stimulus but only allow it to recognize the initial stimulus and when the stimulus is removed.