IONTOPHORESIS

Therapeutic Modalities

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**ION TRANSFER**

* Iontophoresis: Therapeutic technique that involves the introduction of ions into the body tissues by means of low-voltage direct electrical current
* Ion transfer first described by Leduc in 1903
* Has come in and out of popularity

**ION TRANSFER**

* Ionization: the process by which soluble compounds such as acids, alkaloids or salts dissociate or dissolve into ions that are suspended into some type of solution.
* Ions of a specific polarity can be driven into the tissues with a polarity of the same charge
* The force that moves the ions is determined by
* Strength of the electrical field (current density)
* Electrical impedance of tissues to current flow
* Can deliver medication to depths of 6 to 20mm below the skin
* In regular e-stim the active electrode is positive, in Ionto the active electrode is the one your drug is under.
* Under the (-) electrode there is an accumulation of (+) ions making it more Alkaline (more likely to cause tissue damage)
* (-)=acidic (+)=alkaline

**TERMS**

* Electrolytes: Solutions in which ionic movement occurs
* Electrophoresis: the movement of ions in solution

**Advantages**

* Painless
* Sterile
* Non-invasive
* By-pass the liver
* localized concentration of medication vs. sytemic

**Disadvantages**

* Unreliable results with certain medications
* doubt to how much medication is actually introduced into the tissues
* In children anxiety caused by Ionto was not significantly less than that of an injection
* medication must have small ions vs, large
* Only 6 to 20mm depth

**Current Density**

* Size, shape and type of electrodes
* Skin contact
* Adipose tissue or tissue thickness
* Spacing the electrodes (one study says 18 inches apart)

**Iontophoresis Generators**

* Must be able to produce continuous direct current
* Automatically adjusts for changes in current density throughout the treatment
* Automatically shuts down if skin impedance decreases to some preset limit
* Adjustable intensity from 1 to 5mA
* Automatic timer that figures out the duration based on the intensity (mA/min)

**Treatment Setup**

* Clip hairs
* Check for abrasions
* Clean with isopropyl alcohol
* Screen patient for any drug allergies or sensitivities
* Inform the patient of effects and possible side effects
* Treatment Setup
* Place electrodes on patient (polarity of the wire is the same as the polarity of the ion in solution)
* Increase intensity to patient tolerance (no Pain) 3-5mA
* Duration is found by dividing the amplitude by 24mA
* Recheck the skin every 3 to 5 min
* Dose Range - 0 to 80 mA-minutes
* Current Range - 0 to 4.0 mA (constant current; 0.1 mA increments)
* Maximum Voltage - 80V DC
* Display - Dose, Time Remaining, Current (displayed simultaneously with interactive set-up)
* Current Ramp Up - Automatic (0 to 4.0 mA; built in option for manual override)
* Current Ramp Down - Automatic at end of treatment (built in option for manual override)
* Controls - 2 (dose and current)
* Pause Feature - Yes
* Low Battery Light - Yes
* Open Circuit Light - Yes
* Audible Alerts - Yes
* Battery - 1 - 9V (1604A/6LR61)
* Battery Life - 50 - 60 treatments (40 mA-minutes each)
* Accessories - Twin lead cable, batteries (2), carrying case, instruction guide, warranty card
* Warranty - 1 year (limited)
* Includes TL7 snap style twin lead cable

**Types of Electrodes**

* Traditional
* Capsule
* Hydratable
* Integrated electrode and battery

**Medications**

* Dexamethasone
* Lidocaine
* Magnesium
* Acetate
* Chlorine

**Burns**

* Caused from the current not the drug
* pH of the skin is greater than 5
* Sodium Hydroxide which is positive causes an alkaline reaction resulting in sclerosis
* Lesion is pink and raised at first
* Within hours it turns grey and oozing
* Poor electrodes