

## CF Guidelines - Sweat Testing

### Guidelines for sweat tests:

The primary defect in CF affects chloride ion transport across membranes producing excessively viscous secretions. The major presenting symptoms are failure to thrive, recurrent respiratory infections and pancreatic insufficiency resulting in malabsorption. The increased secretion of chloride (and to a lesser extent other) ions in sweat is the basis of a diagnostic test for the condition. A sweat test measures the amount of sodium and chloride (salt) that is in the sweat. Sweat tests should only be performed by experienced Practitioners following national guidelines.

### Patient Suitability:

- A sweat test can be performed after 2 weeks of age in infants greater than 3kg who are normally hydrated and without significant systemic illness.
- A sweat test can be attempted in term infants after 7 days of age if clinically important but will need to be repeated if insufficient quantity of sweat is obtained.
- Sweat tests should be delayed in patients who are dehydrated, systemically unwell, or who have eczema affecting the potential stimulation sites.
- Sweat tests should be delayed in patients who are oedematous and/or on systemic corticosteroids.
- Sweat tests should not be performed on patients who are on oxygen by an open delivery system due to the minimal risk of an electrical spark. This would not apply to infants in a headbox or on nasal prong oxygen.
- Sweat test samples should not be pooled from more than one site, if insufficient sweat collected try again on another day, ensuring the patient is well hydrated beforehand. If still having difficulties, discuss with CF Specialist regarding pooling 2 samples, however the results will need to be interpreted with caution especially if a result is equivocal (borderline).

### Results:

In most cases the test result will clearly show either a high (abnormal) or normal chloride level in the sweat. Results that are equivocal (borderline) or insufficient quantity will need to be repeated. If the results are abnormal a repeat test is also essential to confirm the results. 2 equivocal results will often need further investigation, please discuss with the patient's consultant the need for further tests such as blood test for CF genotype, faecal elastase, cough swab and lung function (if age appropriate).

### Performing a sweat test for CF:

- Explain the procedure to the child and parents. The procedure in total takes approximately 1 hour, during which the child can eat and drink normally.
- Check electrodes before each use, if they show any signs of pitting or buckling then replace. Check pilocarpin gel pads, do not use if out of date, cracked or showing signs of deterioration.
- Clean the skin of the forearm, firstly with an alcohol swab, then with a cotton wool ball soaked in sterile water (NOT SALINE). Dry area with clean cotton wool or tissue. The forearm is the easiest site to use, but the inner thigh may also be used. The skin should be hairless and not be broken or irritated.
- Moisten the skin with clean cotton wool/tissue to ensure good conductivity.
- Gently and carefully place the pilocarpin gel pad in the red electrode and secure to the forearm using a Velcro strap. Repeat this with the black electrode and site this one above the elbow. Ensure electrodes are at least 2 cm apart and the

skin in between is dry.

- Connect the electrodes to the box and switch on. A small current of electricity is passed between the electrodes, this lasts for approximately 5 minutes when the box will the 'beep' and switch itself off. The electricity and the pilicarpin stimulate the sweat glands to produce sweat. Never leave the child during iontophoresis, a tingling sensation is very normal during this procedure, however investigate any complaints of stinging or burning at once. If any evidence of blistering or burning seek medical attention.
- Remove both electrodes from arm, starting with the black electrode and clean the skin. Remove the red electrode and clean that area thoroughly using cotton wool/tissue soaked in sterile water (NOT SALINE). Dry thoroughly with another cotton wool/tissue. A red area will be seen and this is quite normal.
- Immediately place the collecting duct exactly over the reddened area and firmly secure with the appropriate Velcro strap and bandage. There is a blue dye on the back of the collecting duct so that sweat can be seen in the tubing.
- The collecting duct must remain in-situ for a minimum of 20 minutes and maximum of 30 minutes, after which no more sweat will be collected.
- Remove the bandage and the clear round cover of the collecting duct. Locate the end of the tubing with the blunt dispenser provided and secure the dispenser in the end of the tubing.
- Carefully unravel the tubing, ensuring that the dispenser is not squeezed as this will push the sweat out of the tubing. With the clippers provided, cut the tubing as near to the base as possible.
- Gently squeeze the dispenser so that the sweat is deposited in the specimen pot. Label this pot and send to lab for analysis.
- Remove the collecting duct and dispose of it safely, retaining the Velcro straps.
- Clean the skin.
- Clean the electrodes with sterile water and dry.

### **Results:**

- < 40 mmols sweat chloride ions - normal
- 40 – 60 mmols sweat chloride ions - equivocal
- 40 – 60 mmols sweat chloride ions - equivocal

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