The Children's Hospital of Philadelphia  
Division of Allergy and Immunology

Patch Test Preparation and Application for Eosinophilic Esophagitis

Selection of foods:

Careful diet history is obtained and any food that is suggested of causing a reaction is tested. If a family cannot identify any foods causing symptoms, a general screen is done. The current general screen is: Milk, Egg, Soy, Peanut, Wheat, Rice, Corn, Oat, Barley, Potato, Beef, Chicken, Ham, Lamb, Turkey, Peas, Green Beans, Squash, Carrot, Sweet Potato, Peach, Pear and Apple. The exact foods are dependent of the physician’s judgement.

All foods are tested by percutaneous or “scratch” tests and patch testing.

Always include a negative control (saline) for patch testing.

Patients must be off oral steroids or other systemic immunosuppressants for one month before testing. Topical immunosuppressants (Protopic, Elidel and topical steroids can not be used at the site of patch testing for one week prior to application of the patch tests).

Supplies:

- Dry powder foods
- Jarred single ingredient baby foods
- Patches (Finn Chambers) and patch trays (Available from Allerderm, www.allerderm.com)
- Gram Scale

Typical foods tested for patch

**Dry Powders**- Milk, Soy, Potato, Rice, Oat, Wheat, Corn, Egg, Barley, and rye.

**Jarred Baby Foods**- Chicken, Turkey, Lamb, Ham, Beef, Sweet Potato, Green Beans, Pea, Bananas, Apple, Squash, Carrot, Pear, and Peaches

**Other**- Peanut

Finn Chambers- “Patch Stickers”

The “50 x 5” size Finn Chambers are used in most cases. For “bigger” children 12 yrs and older, the “200 x 1” size Finn Chambers are used for milk, soy, chicken, and beef. *The selection of foods and size is per the attending physician.*
Dry Powder Food Preparation
For dry foods, 1 gm of foods is mixed into 1 ml of sterile water. For milk, 3 gm of food into mixed into 1 ml of sterile water.

Small quantity (1-4 gms) of powdered food is placed into plastic medicine cup. Sterile Water (1-2 ml at the ratio mentioned above) is added via a syringe to powdered food, to make up a fine “pasty” paste. The consistence is similar to wallpaper paste. The food and water are mixed with plastic coffee stirrers.

Patch Preparation
Place patches (Finn Chambers) in patch trays. Trays are marked with arrows as to help in preventing any “mispositioning” of the patches.

Once dry powdered foods are prepared, the foods are placed into the aluminum cups (Finn Chambers on Scanpore, Allerderm Laboratories, Inc. Petaluma CA). Enough food is placed in the well to cover the entire bottom of the well. Excess of food, food higher than the level of the well, should be removed.

For fruit and vegetable jarred baby foods, use the more “solid” portion of the foods- often time found around the rim of the jar, or under the cap. The solid portion of the jarred baby foods is needed to cause a potential positive response. Avoid too much “watery” portion of the food.

Pointer: I have found it best to prepare the jarred baby foods portions of the patches first. These foods contain more liquid, and tend to dry up less fast. I apply the “dry powder” foods to the patches last, with milk being the last one to apply to the patch.

Applying the Patches

- Have parent or older child remove or lift up shirt/ blouse/ clothing to expose back.
- Locate area on back where there is ample and relatively flat space to apply patches.
- Clean off selected area on back with alcohol prep, and let dry.
- Gently remove the paper from the unexposed covered edge of patch, and place patch on desired location, holding the patch very taught immediately prior to application so as to avoid “wrinkling”, “bulging”, or “buckling” of the patch sticker.
- Continue to do the same for the remaining patch stickers.
- Once the patches have been put in place, seal the patch sticker around each well by gently rubbing a finger over the tape surrounding the individual wells, to make certain that the wells are sealed by the tape.
- After all wells have been sealed, take a black Sharpee marker, and place a dot on the skin next to the individual wells.
- If the patches appear to be not sticking very well, medical tape can be applied to help secure the patches to the skin. (If taping the patches, make certain that the patches are flat, with all wells in direct contact with the skin)
- Draw a basic map on the patch testing sheet of the region on the child’s back where the patches were placed, and the order/positioning of the patches.

**Pointers**- Avoid applying the patches on areas such as the scapular edges and places which may undergo a good bit of motion. For bigger and older children, I find that the lower region of the back is a good location for placing the patches.

For the larger “200 x 1: chambers, it is easiest to work with the wells individually, and to apply these patches individually.

**Desired positioning for patients**
For older cooperative children, have them stand straight, with their shoulders back.

For infants, have the parents hold the child, with their faces towards the parents.

For younger children, have them sit in their parents laps, facing their parents, and have them sit as straight as possible.

**Teaching Items for Parents**

- Keep child’s back dry until time of patch removal-approximately 48 hr after patch application.
- Tell parents of the importance of the wells being in direct contact with the skin for the 48 hours. If the parent notices that a patch is beginning to come off of the skin, or if a well is lifting away from the skin, then medical tape should be applied to secure the patches and wells to the skin.
- After 48 hours from the time of patch application, have parents gently remove patches, and then wash off the back with soap and water. Encourage parents/child to try and leave some of the “Sharpee” mark remaining on the skin, to aid in the patch reading.
- Provide family with “day” and “after hrs” telephone numbers in case of questions/concerns.
- Remind families of follow-up appts 72 hours after patch application.
Reading of Patch Tests and Interpretation of the results

Reading of results:

Patch tests are read at 72 hours after application of patches. Patch tests are read on scale of 1 to 3, similar to contact dermatitis.

0: No reaction
1: Single or scattered red papules with min. induration
2: Solid red area with moderate induration
3: Solid red area with significant induration

Negative: Reaction 1

Reaction 2:

Reaction 3:

Any food with a reaction of 1 or greater is considered positive. If the saline is positive, then the results should be repeated in one month.
Diet recommendations:

Avoidance of all positive foods (either skin test or patch test) for 2-3 months with a repeat endoscopy and biopsy at that time.

If biopsy are normal:
Avoid food for a total of 6 months, and reintroduce one new food a week. IgE-positive foods should be introduced by formal food challenge or repeat scratch testing with conversion to negative before reintroducing at home due to the concern for anaphylaxis.

If biopsy are not improved:
Elemental diet is recommended for 1 month, with repeat biopsy. If biopsy are still not normal, the patient do not have food-mediated disease and alternative therapies are discussed. If the biopsy are normal, then reintroduction of foods, one a week starting with fruits and vegetables, progressing to grains then meats and finally “allergic foods” (milk, egg, soy, peanut, fish, and nuts).

If biopsy are improved but not normal:
Review diet history to make sure the occult allergic foods are not added to diet. Foods should be avoided for another 2 months and repeat biopsy again