Selection of Antigen Therapy

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Selection of Antigen for Therapy

- The number of antigens available from supply houses for treatment of allergy almost limitless
- Practical and Cost factors influence the amount of allergens purchased
- Limitation by third party payers
- History of “Venipuncture Allergist”
- Which antigens to chose becomes an important task of setting up an allergy practice
Regional Allergens

- It is rare to have more than 30 to 40 inhalant allergies of significance in one location.
- A determination of the major allergens in a geographic area, coupled with the patient's history of specific exposures.
- Be aware of the beginning and end of the blooming seasons of different plants.
Resources Available

- Supply Houses (Regional Maps)
- [WWW.aaaaai.org](http://WWW.aaaaai.org).
- National Allergy Bureau NAB
- Index Allergens (Extracts in greatest demand)
- Walter Lewis Text book of regional allergens
Tree Pollen Maps

Tree pollination season typically extends from late February through June. Updated daily at 5PM EST
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Major Categories or Allergens

- **Seasonal**
  - Trees
  - Grass
  - Weeds

- **Perennial**
  - Dust
  - Epidermal
  - Mold
Seasonal Allergens-
Blooming Seasons

- Hay Fever
- Pollens (Severity vs. Duration)
- Physician has to become acquainted with the pollen allergens in an area and the degree of importance of each
- The length of the seasons can be affected by the latitude, prevailing winds, rainfall, etc.
- The sequence of blooming in the country and in a local area may vary by weeks
Trees-Spring

- 6-12 weeks
- Elm trees – snow on the ground and again in the fall
- Mountain Cedars- Winter.
Elm Tree Pollen
Grass-Summer

- Pollinates in the Summer
- Season last 6-12 weeks
- Subtropical areas vary (year round) but still predominate in the summer
- Strongest allergens may be associated more with anaphylaxis
- Charles Blackley and Noon Units.
Weeds-Fall

- Mid August until the first frost
- Well known allergy season in the north East
- Rag weed is an index plant in the majority of allergy studies.
- The range of weeds is varied and there is some reactivity with some subfamilies.
Winter

- Very little Bloom
- People are indoors
- Perennial allergens are the major offenders
Thommen’s Postulates

• Wind-Borne
• Produced in large quantities
• Buoyant to be carried by the wind for considerable distances, with a diameter of 15 to 58 mcg.
• Abundantly distributed, or habitually grown near human habitation.
• Must be allergenic.
Cross Reactivity

• Pollens as well as other allergenic entities contain more than one allergen
• Many plants causing inhalant allergenic activity contain a variety of allergens that are identical or very similar to those of other plants in the same family.
• Sensitivity is based on the response to a specific allergen
• Not necessary to treat with a variety of pollens that contain the same allergen.
Cross-Reactivity Pollens

• From plants to foods
• From subfamily to subfamily
• Order of cross-reactivity
  – Grasses
  – Weeds
  – Trees
Grass (Gramineae)-Cross reactivity

- Pooideae
  - Brome, June, perennial rye, fescue, sweet vernal, orchard and *Timothy*

- Chloridoideae
  - *Bermuda*, grama

- Panicoideae
  - *Bahia*, crabgrass, Johnson and others
Weeds- Cross reactivity

- Compositeae
  - Astereae: Groundswell
  - Heliantheae: **Ragweed** (10-12 types)
  - Helenieae: No significant allergens
  - Anthemideae: dog fenel, wormwood, sage, mugworts

- Chenopodiaceae
- Amaranthaceae
- Plantaginaceae
Cross Reactivity
Trees

- Cross reactivity between trees is truly minimal
- Only among closely related subfamilies
- Oak, Elm, Birch cross react incompletely
- One way to select the allergen extract is to select the tree of a specific Genus Name (Quercus, Juniperus) and select the most antigenic or most prevalent in the area.
Seasonal Allergen Selection

• Reviewing the regional maps
• Checking index allergens
• Being aware of some of the local allergenic plants (Check with the local botanist)
• Which plants in the area are in a significant quantity and which are limited or absent
• Physician knows which plants have allergenic propensities
• Most board will contain less than 20 allergenic extracts which provide appropriate treatment for 80% of patients
Perennial Allergens
House Dust

• House dust universal allergen made up of about 28 allergenic components. It is a collection of lysine residues in the process of degradation.
• Dust mites allergen is very similar but less potent than house dust.
• Dermatophagoides farinae and D. pteronyssinus
Dust Mites
Perennial Allergens
Epidermal

• Pet dander- Dog, Cat, Mouse, Rat, Gerbil
• Immunogenically, dog and cat are potent allergens
• You can be exposed remotely
• Dog antigen is heavier than cats - sinks to the floor.
• Testing for cat and dog in a patient with multiple sensitivities should be standard.
Epidermals cont.

- Other epidermal offenders include horses, cattle, goats localized to farm and ranches
- Barn Dust extract
Perennial Allergens

Mold

• Major offender in the inhalant allergy group
• Mold spores range 2-200mcns. The allergenicity and cross reactivity of mold is still questionable.
• The active allergen in molds is the spore head
• Allergenic extracts are made from the mold hyphen
• Molds react poorly to testing
Molds Cont…

• Perennial symptoms, aggravated in damp, cool weather and low places
• Universal Dominants
  – Alternaria, Aspergillums, Cladosporium, Penicillium, Helminthosporium, and Pullularia
• 8-10 molds are usually sufficient for testing.
Mold Spore
Adding Antigens to the Testing and Treatment Battery

- Patient driven, flowering plants heavy pollen
- Utilization patterns over a period of time years
Quantity and Type of Antigen Extract Needed

• Concentrates
  – Weight /Volume versus Standardized
    • Tremendous variation in extracts
    • Stick to a provider
  – Concentrate Preservative
    • 50% glycerin lasts 3 years
  – Quantity of extract Needed
    • Comes in 10, 20, 30 and 50 cc
Summary

• Reduction of antigen selection can be achieved by paying close attention to the patient's history.
• Identifying the most prevalent or the most frequent allergens in a specific community.
• Choosing the most antigenic or prevalent allergen in each subfamily group category.
• Cross reactivity varies within each group of allergens. Be careful of over treating with grass allergens.