Managing Allergic Rhinitis and Chronic sinusitis

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Morbidity

- Fatigue
- Concentration
- Lethargy
- Insomnia
- Emotional well being
- Embarrassment
- Missing school/work
- Halitosis
- Difficulty studying
- Sniffing/snorting
- Blowing nose

Case presentation allergic rhinitis 1

- Mr CS 16 yrs
- Symptoms: sneezing, itchy nose, rhinorrhoea, postnasal drip
- Blocked sensation, headaches and anosmia when particularly bad.
- Poor sleep, frequent waking, tired
- Perennial with a seasonal component

Case presentation allergic rhinitis 2

- Symptoms began at 5 yrs, worse each year
- Eye symptoms: red & itching, grittiness
- Uses Loratadine prn
- PMH: eczema in childhood, mild asthma
- FH: sister has asthma
- Environment: villa, old carpet, cat on bed

Case presentation allergic rhinitis 3

- Physical findings
- Allergic shiners, sneezing, swelling of the nasal mucosa
- Red eyes
- Chest: mild wheezing

Skin test results 4

• Saline	0 mm
• Histamine	5 mm
• Grass mix	12 mm
• HDM	10 mm
• Cat	1 mm
• Dog	1 mm

Epidemiology of allergic rhinitis

- Tecumseh MI 7.5% (M), 8.2% (F)
- Sweden 15% (M), 14% (F)
- Denmark 7%
- Overall 5-20%

Increase in Allergic rhinitis

- 1955 5.1 per 100 000
- 1970 10.6 per 100 000
- 1981 19.7 per 100 000

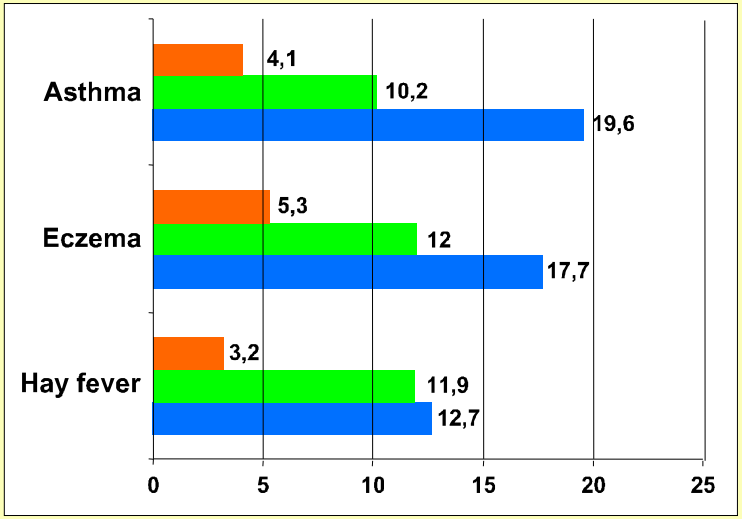
Uk General Practice

Increase of allergy in children

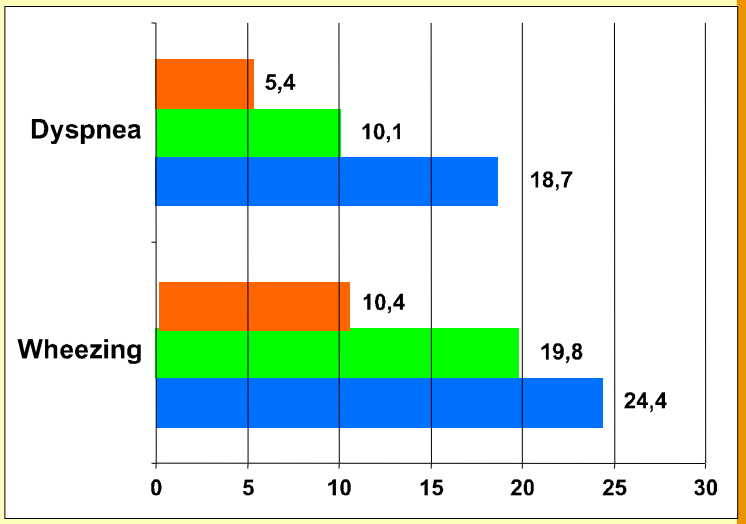
- based on questionnaire in Scotland

Russell G. et al. BMJ 1997;315:1014

Allergic diseases

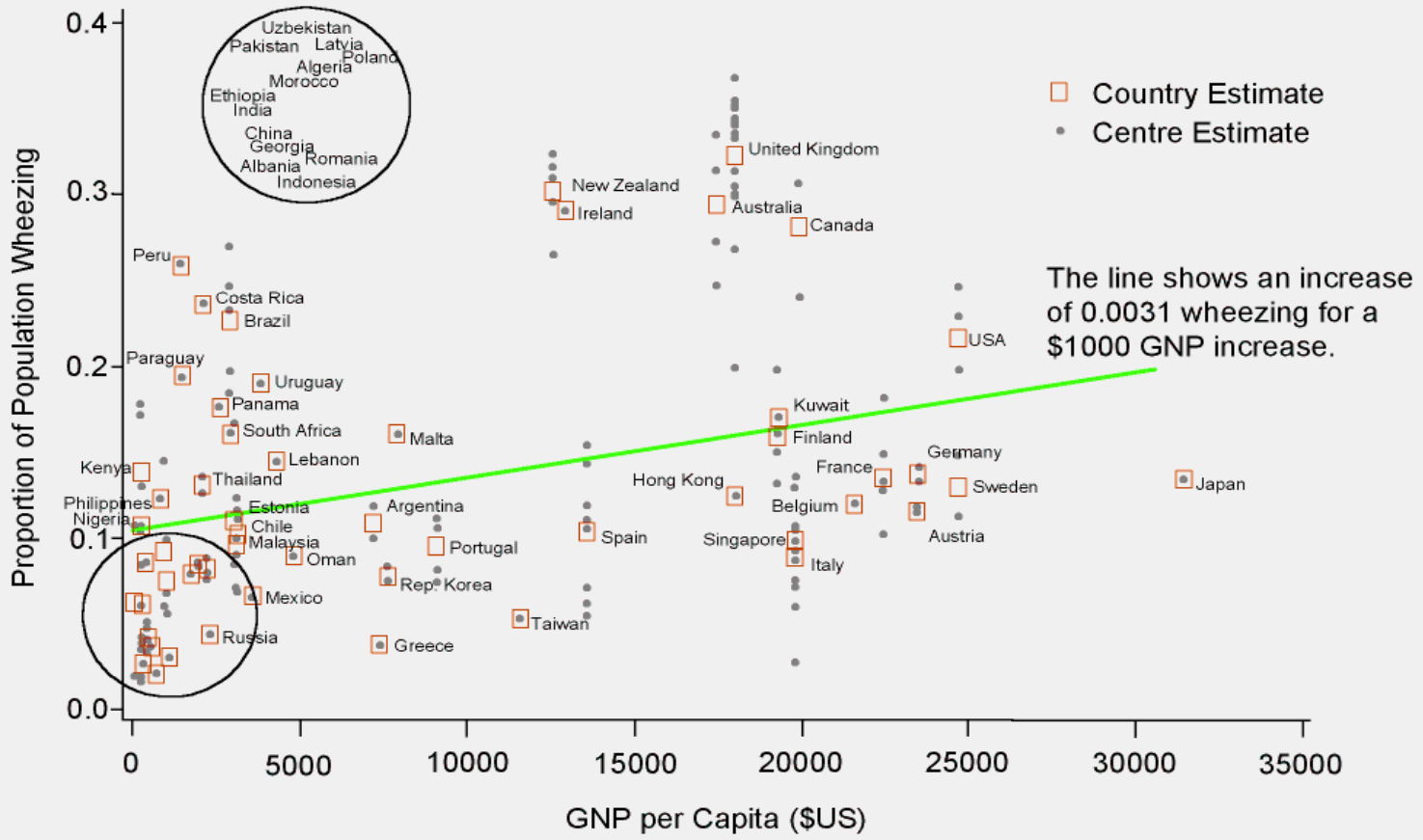


Respiratory symptoms



1964 1989 1994

Association between prevalence of wheeze in 13-14 year olds and GNP per capita



Increase in atopy

- Hygiene (dirt) hypothesis
- Immunisations, antibiotics
- Diet
- Exercise
- Homes better insulated
- Pollution
- Pet ownership
- Occupational

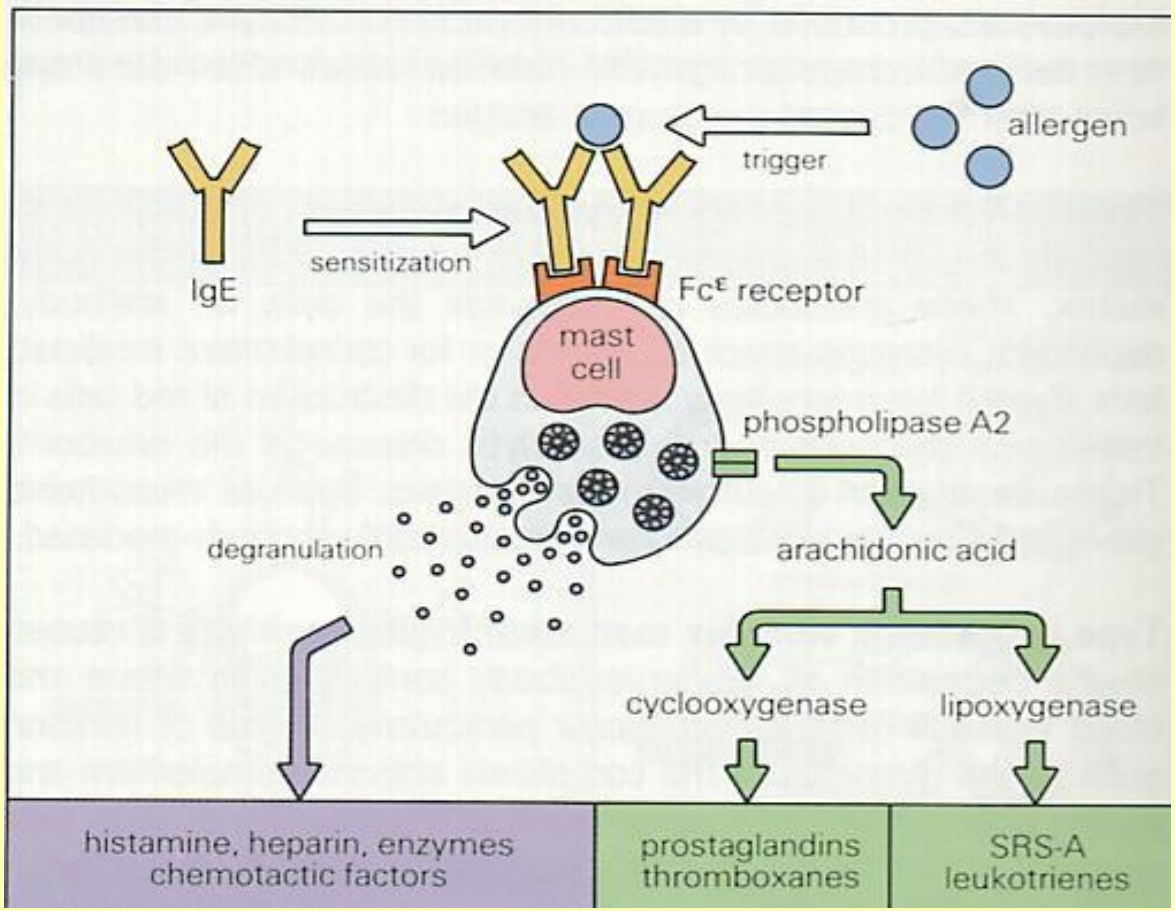
Inheritance of atopy

- Neither parent atopic 10%
- One parent atopic 30%
- Both parents atopic 60%
- Both parents and one sib >80%

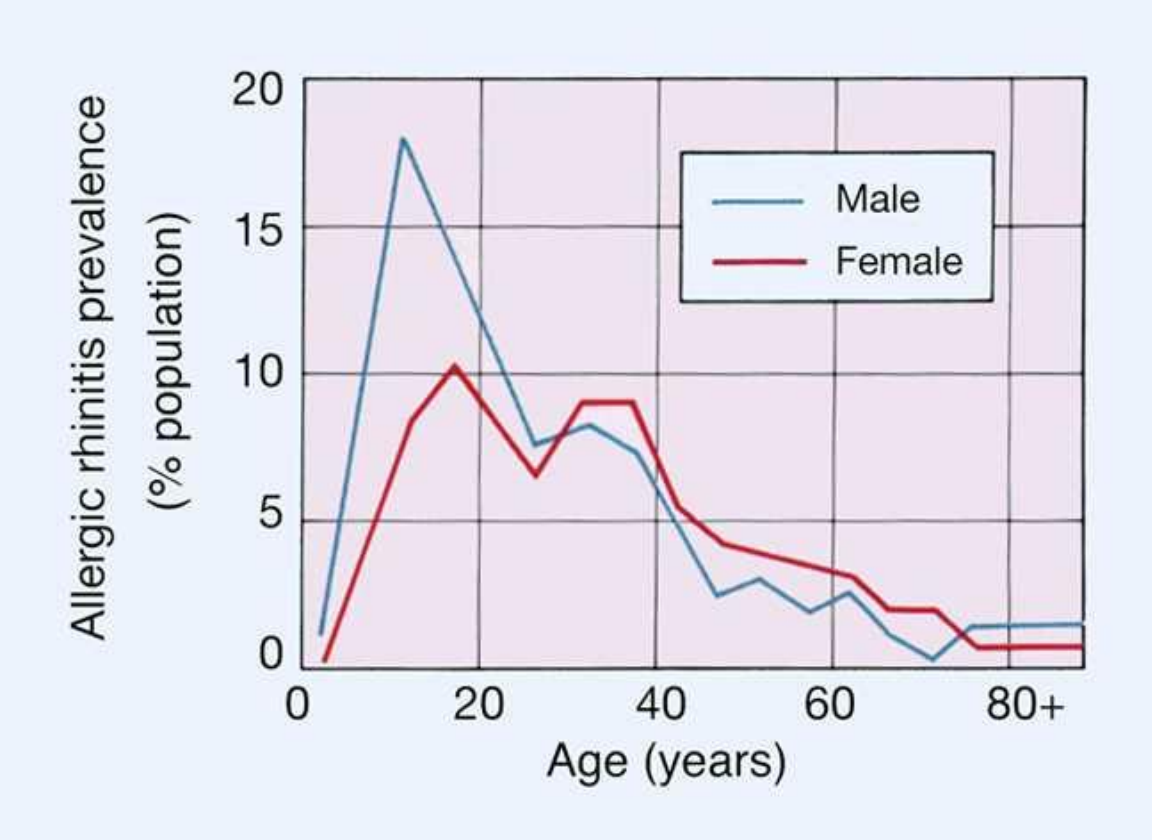
Pathogenesis

- Response of URT to allergen
- Genetically determined IgE response
- Associated with other allergies
- Most children have an allergic trigger
- Natural history is to improve in later life

Pathogenesis



Prevalence of allergic rhinitis by age group



Nasal features of allergic rhinitis

- Symptoms — obstruction, rhinorrhoea, sneezing, pruritus, hyposmia
- Signs — swelling, (polyps), twitching, salute

Pharyngeal features of allergic rhinitis

- Symptoms — soreness, pruritus
- Signs — postnasal drip, throat clearing, cough

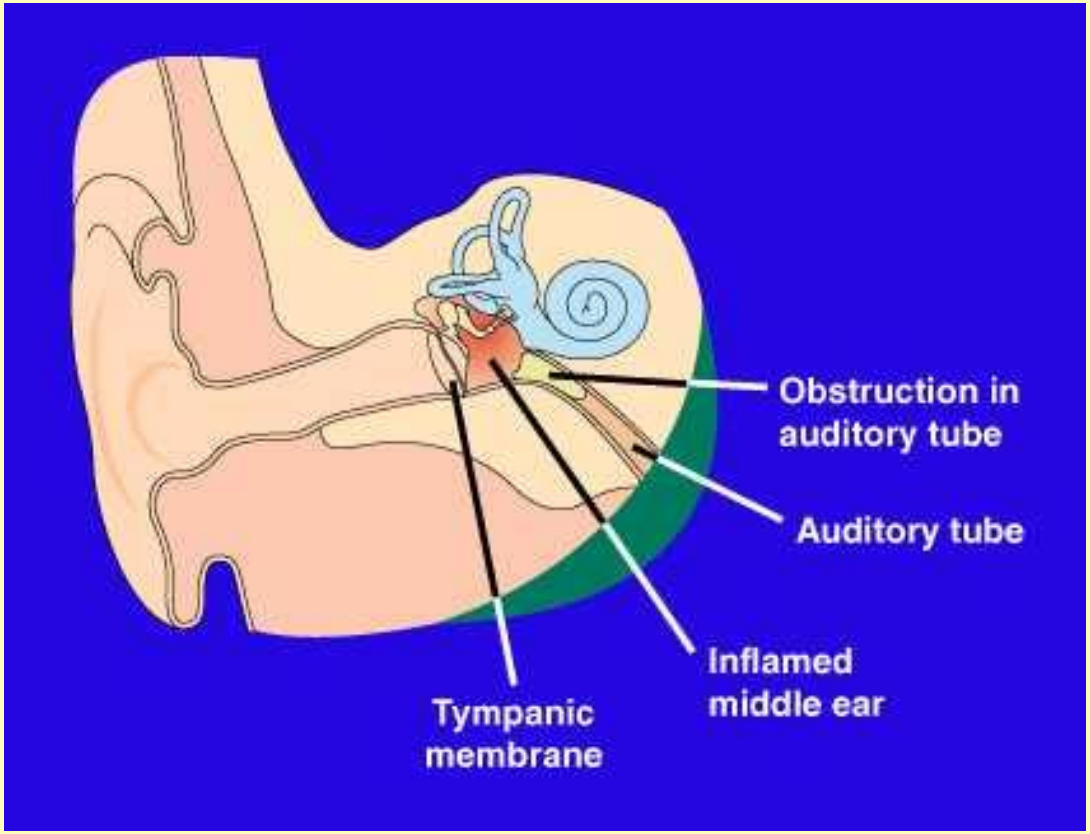
Sinus related features of allergic rhinitis

- Symptoms — headache, fullness, lethargy
- Signs — tenderness

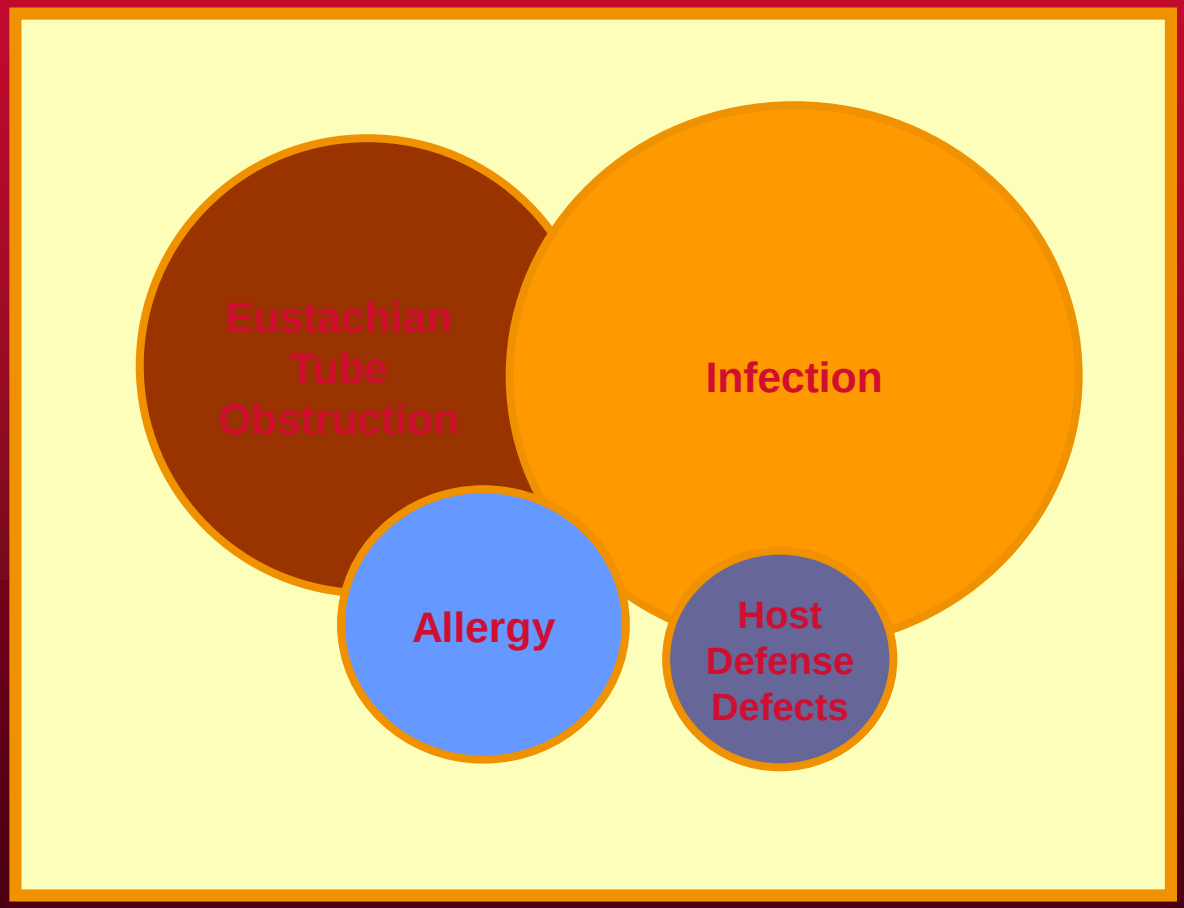
Aural features of allergic rhinitis

- Symptoms — pain, popping, pruritus
- Signs — bulging drums, fluid, hearing
- Must be considered a cause of recurrent otitis media

Allergy as a cause of chronic OM with effusion



Allergy as a cause of chronic OM with effusion



Seasonal pattern

- Perennial — allergic rhinitis
  non-allergic rhinitis
- Seasonal — grass, weed and tree pollens
- Perennial with a seasonal component

Clinical evaluation

- History:
  - age of onset
  - progress,
  - geographic
  - triggers
    - specific
    - irritant
    - complications
  - treatment
    - topical
    - oral
- Associated atopic conditions
- Surgery

Clinical evaluation

- Environmental hx carpeting, drapes
  lounge suite
  soft toys on bed
  pets, smokers, mould
- Work and school environment

Examination of the nose

- Nasal septum (deviation, colour, spurs, ulcers, perforations)
- Turbinates (size, swelling, colour)
- Secretions (colour)
- Sundry (polyps, cysts, foreign bodies, tumours)

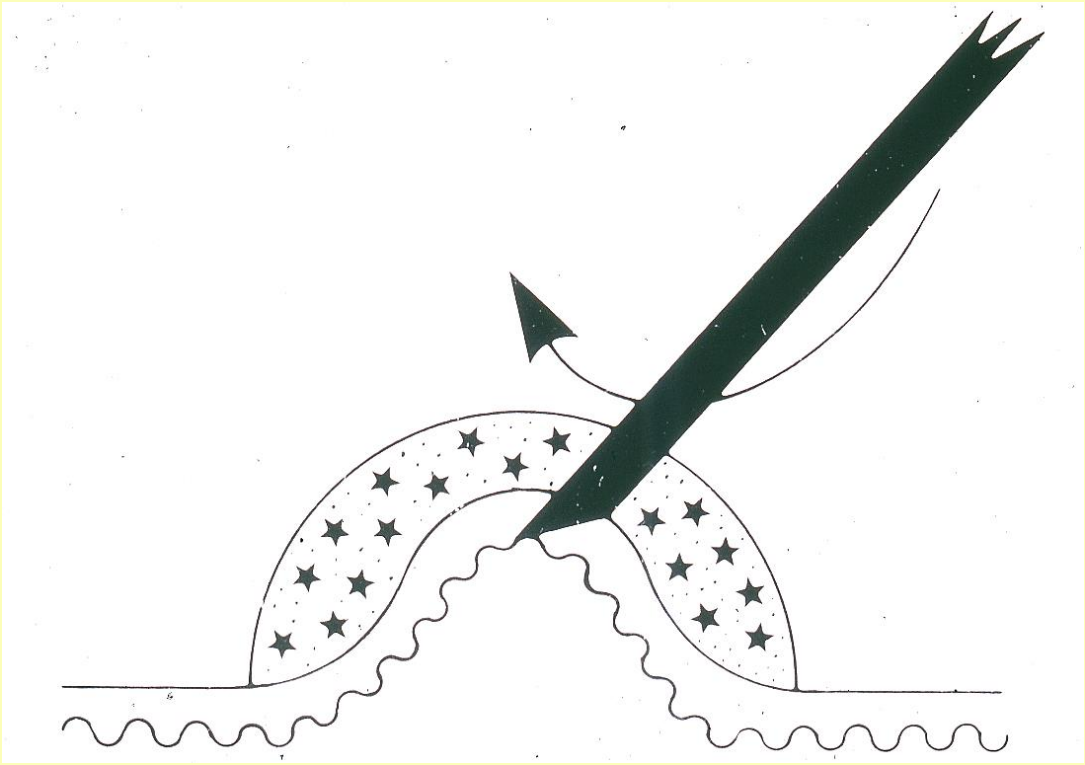
Physical findings

- Exterior
  - Eczema
  - Nasal crease
- Intranasal
  - Swelling of mucosa, polyps
  - Septal deviation
  - Nasal ulceration
  - Crusting
  - Mucous discharge

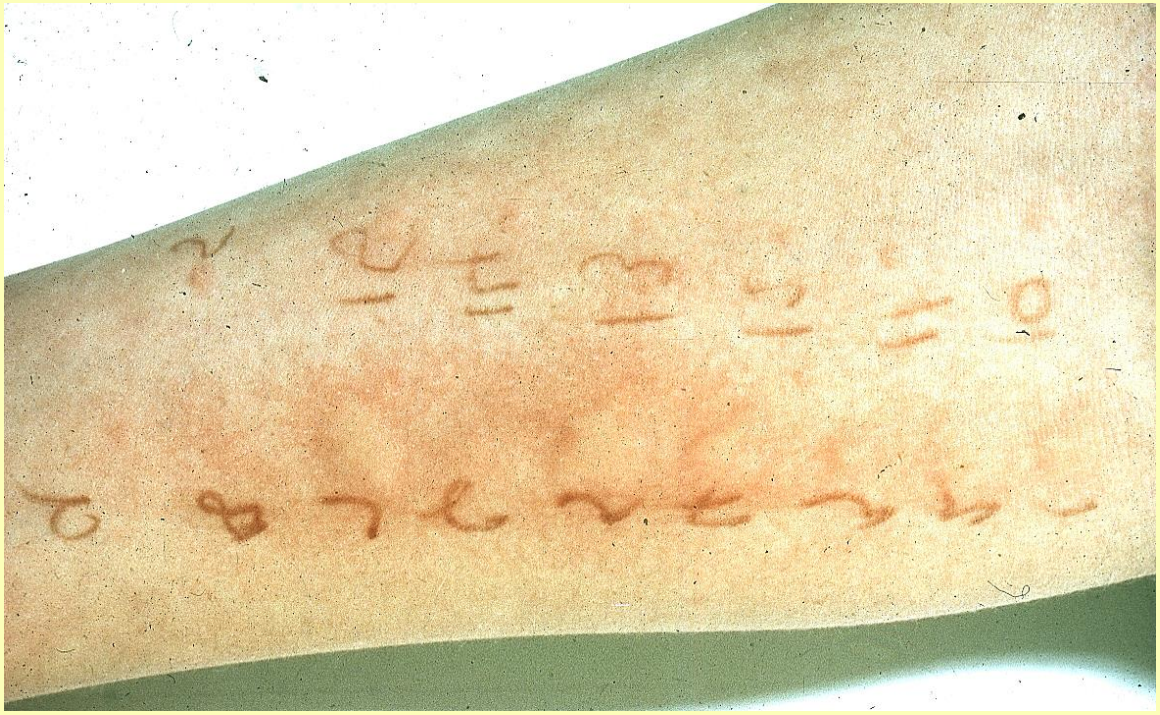
Investigations

- FBC & diff
- Skin testing
- Sp IgE testing if appropriate
- Immunoglobulins
- CT sinuses (see below for indications)

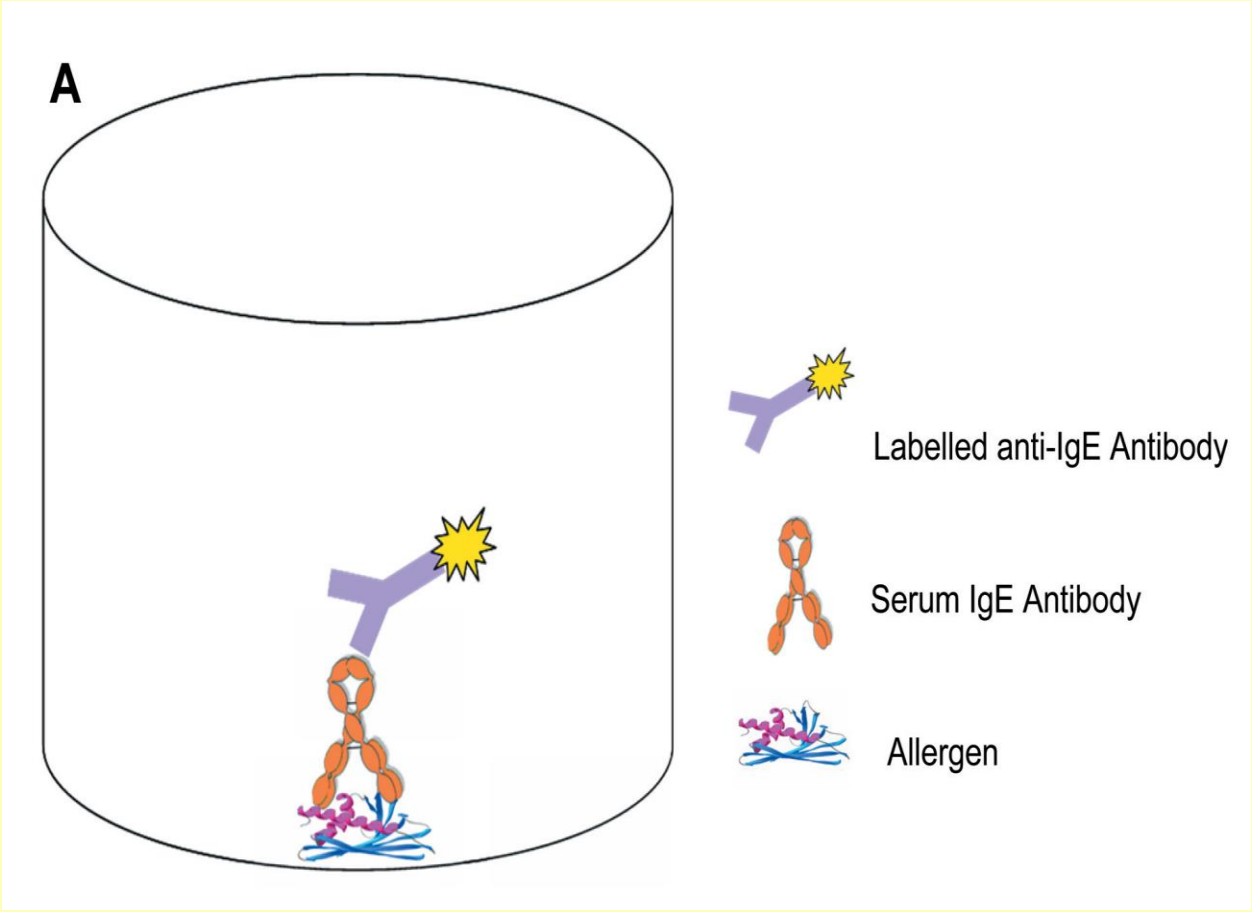
Skin testing



Skin testing



Specific IgE testing



Differential diagnosis

- Non allergic rhinitis
- Viral, bacterial or fungal rhinitis/sinusitis
- Rhinitis medicamentosa
- Samter’s triad
- Foreign body
- Congential abnormality
- Immune disorder eg Wegeners
- Malignancy

Imaging

- Anatomical factors suspected
- Unilateral symptoms
- No response to medical management
- Suspected malignancy
- Pre-surgical

Allergens

- Indoor allergens- can be avoided
- Outdoor allergens- cannot be avoided

Trigger factors

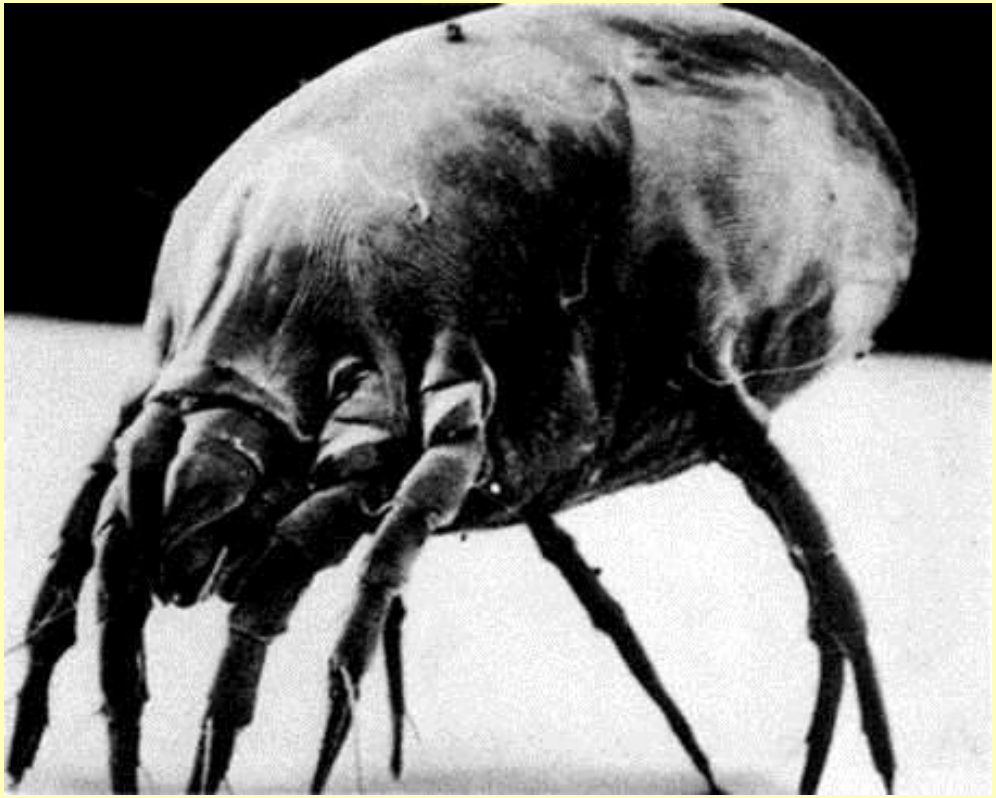
- Indoor allergens
  - HDM
  - Cats
  - Dogs
  - Moulds
- Occupational factors

Trigger factors

- Outdoor allergens

  Grass pollens
  Tree pollens
  Weed pollens
  Moulds

Dust mites



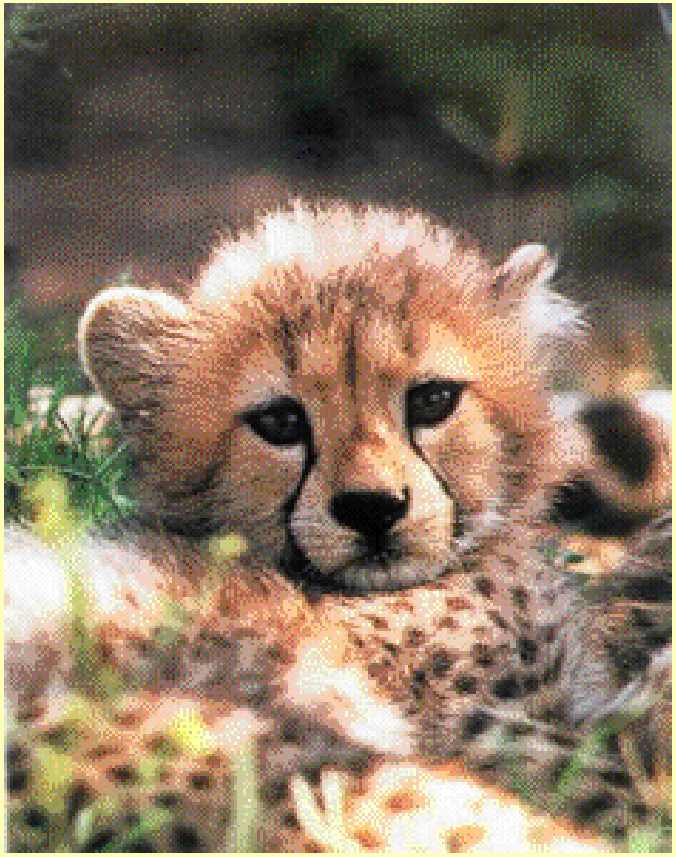
Dust mite ecology

- Microscopic arthropods
- Feed off human scales
- Prefer high humidity and temperate climate
- Fecal pellets coated with digestive enzymes
- Allergens reside in fecal pellets
- HDM allergy is generally hay fever or asthma

Dust mite avoidance measures

- Pillow, mattress and duvet covers- most effective measure
- Wash bedding in a hot cycle
- Dehumidifier or HRV
- Dust mite sprays
- Soft toys: remove or freeze and wash
- HEPA vacuum cleaner
- Remove carpets if feasible

Allergy to cats



Cat allergy

- NZ has one of the highest cat ownership rates in the world
- Fel D1, mw 39 kD, dimeric, from pelts
- Synthesised in the skin
- More than 85% have IgE to Fel D1
- Large allergen, airborne
- Very “sticky”

Cat allergy

- Lasts >2 yr after cat is removed
- High concentrations, in schools etc
- Very important to find out if the patient is symptomatic

Allergy to dogs

Dog allergy

- Less common than cat allergy
- Major allergen Can F1
- Present in houses, schools etc

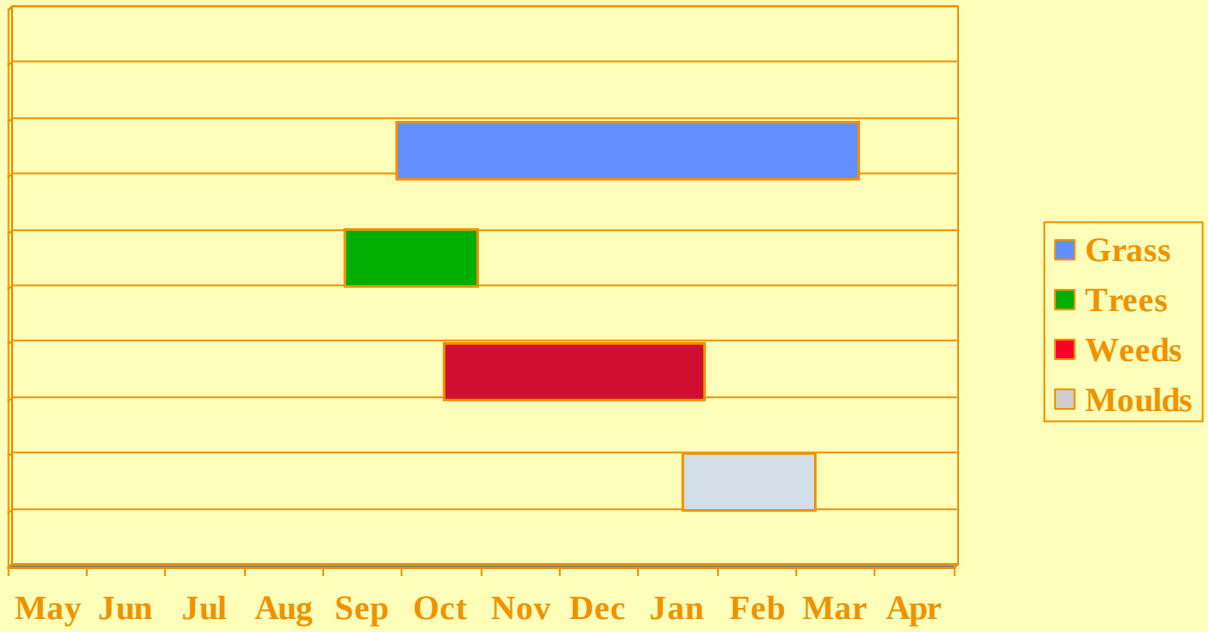
Cockroach allergy

- Major problem in the US and Africa
- Urban populations are heavily exposed
- Bla g1 (mw 30 kD) and Bla g2 (mw 36 kD)
- Strong correlation with asthma
- Role in AR is being investigated
- Probably not a major problem in NZ

Pollens

- Grasses: Rye, Cocksfoot, Timothy, Vernal
- Weeds: Plantain, Privet (irritant)
- Trees: Birch, Acacia, Pines, Olive, Plane
- Moulds: Alternaria, Aspergillus

Pollens


May
Jun
Jul
Aug
Sep
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Nov
Dec
Jan
Feb
Mar
Apr
Grass
Trees
Weeds
Moulds

Therapeutic options

- Allergen avoidance
- Anti-inflammatory therapy
- Immunotherapy
- Surgery

Drug treatment

Drug treatment

- Decongestants: oral or topical
- Antihistamines: oral or topical
- Cromoglycate
- Ipratropium
- Nasal steroids

Decongestants

- Oral or nasal
- Oral: tachyphylaxis
- Nasal: danger or rhinitis medicamentosa
- Use for 2-3 days as adjunctive therapy
- Side effects aggravation of hypertension, glaucoma, urinary retention

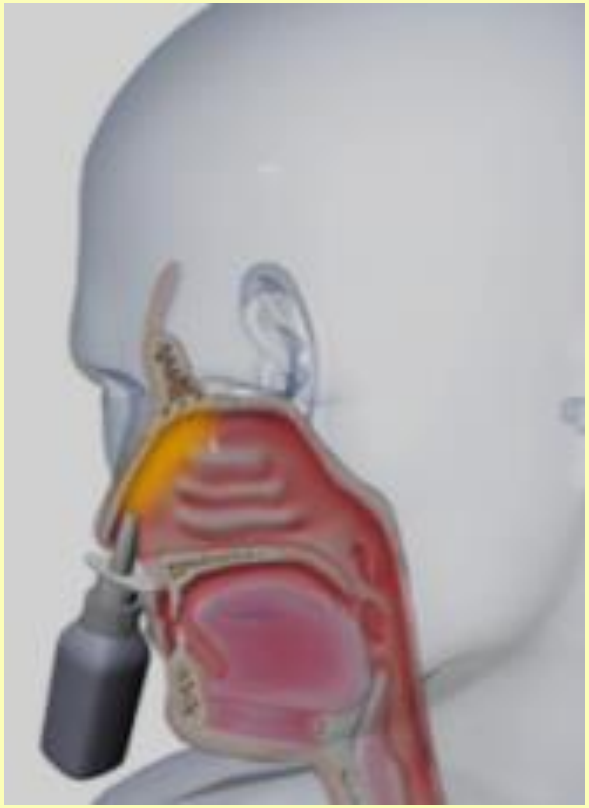
Antihistamines

- May need twice daily treatment
- Larger doses may be needed
- Combinations of AH can be useful
- Combination with nasal steroids
- Some newer antihistamines can sedate
- Expense was a significant barrier for therapy
- Syrup is more expensive

Nasal steroids

- Useful for both AR and NAR
- Useful in combination eg antihistamines
- Helps reduce late phase reactions
- Adverse effects, crusting and epistaxis
- Fewer SE with aqueous preparations
- Inspect nasal mucosa every 3 months
- Adequate technique
- Will not work immediately

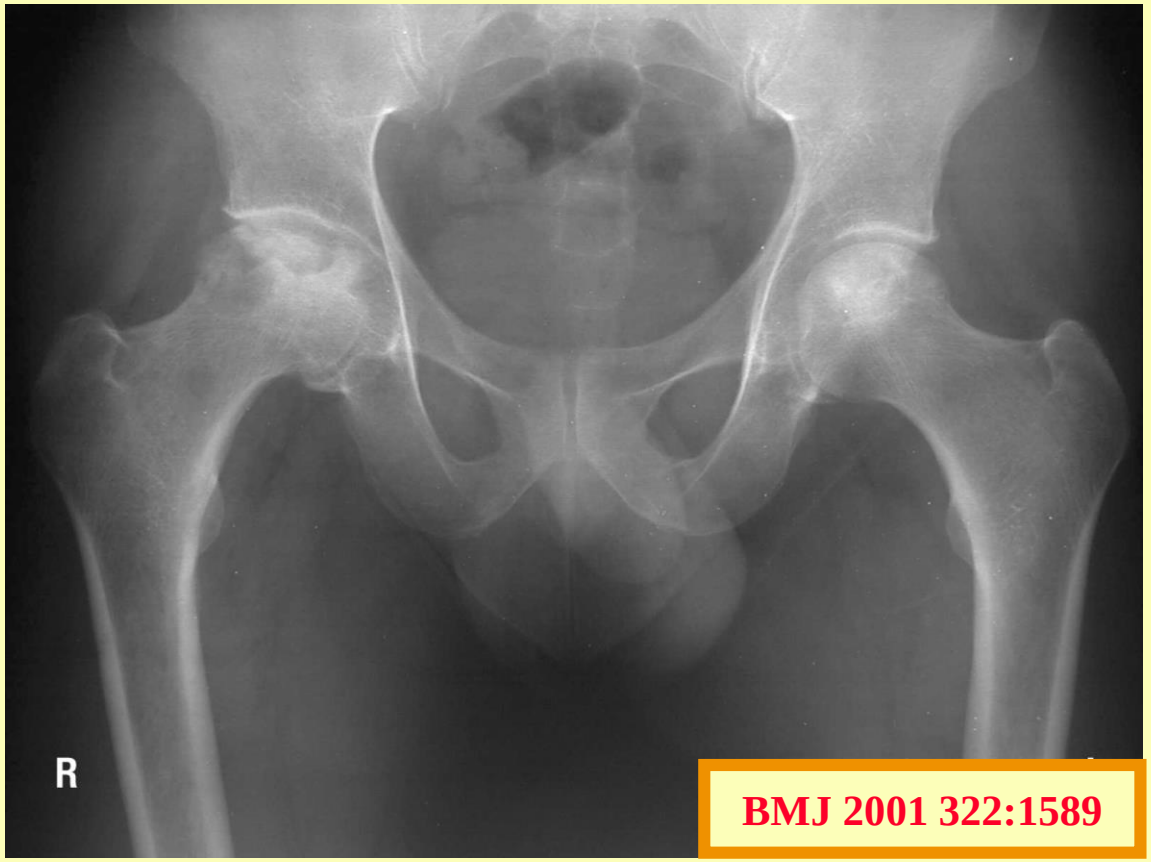
Nasal steroids: correct technique



Not recommended

- Yearly depot steroid injections
- Intranasal steroid injections
- Long term oral steroids

Avascular necrosis after depot steroid injections for hayfever

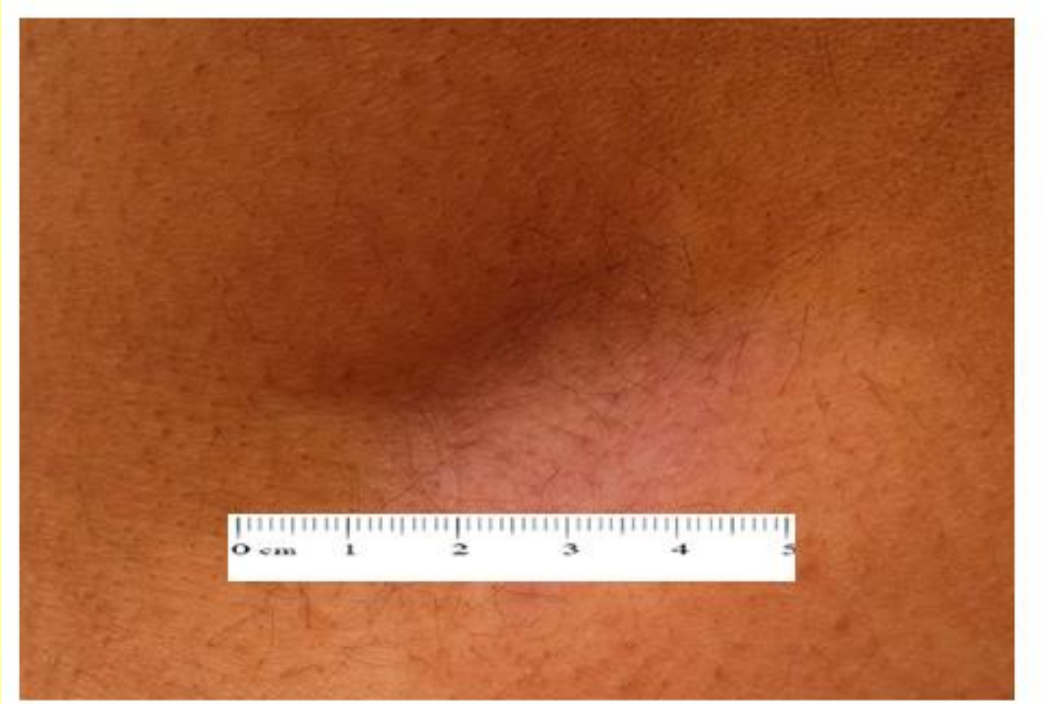


BMJ 2001 322:1589

Avascular necrosis after depot steroid injections for hayfever

BMJ 2001 322:1589

Gluteal atrophy caused by depot steroid injections for hay fever

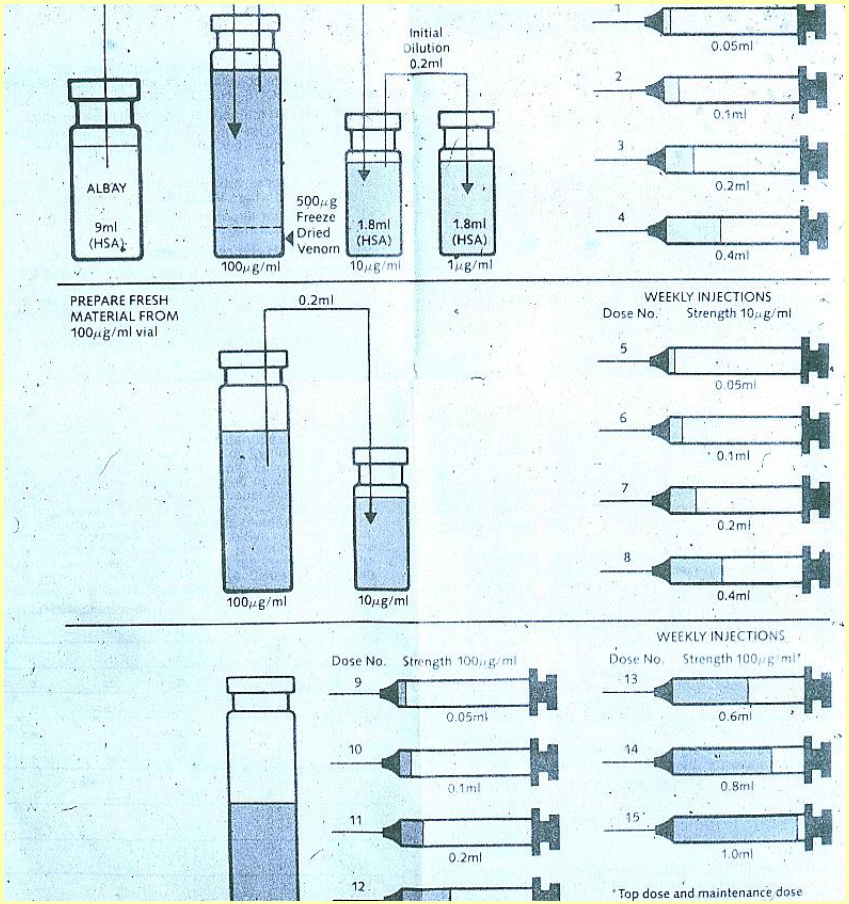


Ameratunga WAO Journal 2013

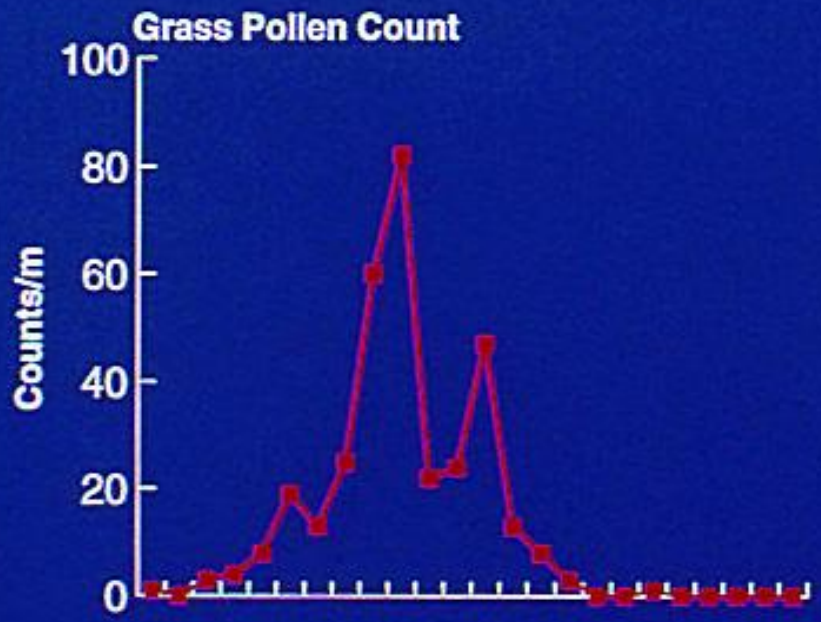
Immunotherapy

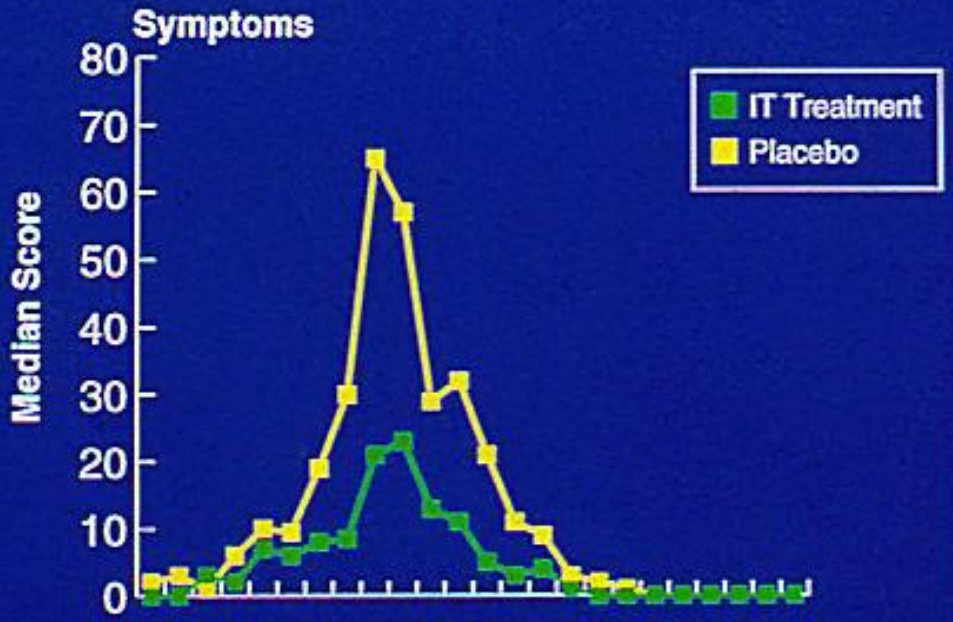
- Requires identification of specific allergens
- Administered in two phases
- Generally given for 3-5 years continuously
- Benefit for hay fever is well established
- Small risk of local and systemic reactions

Desensitisation



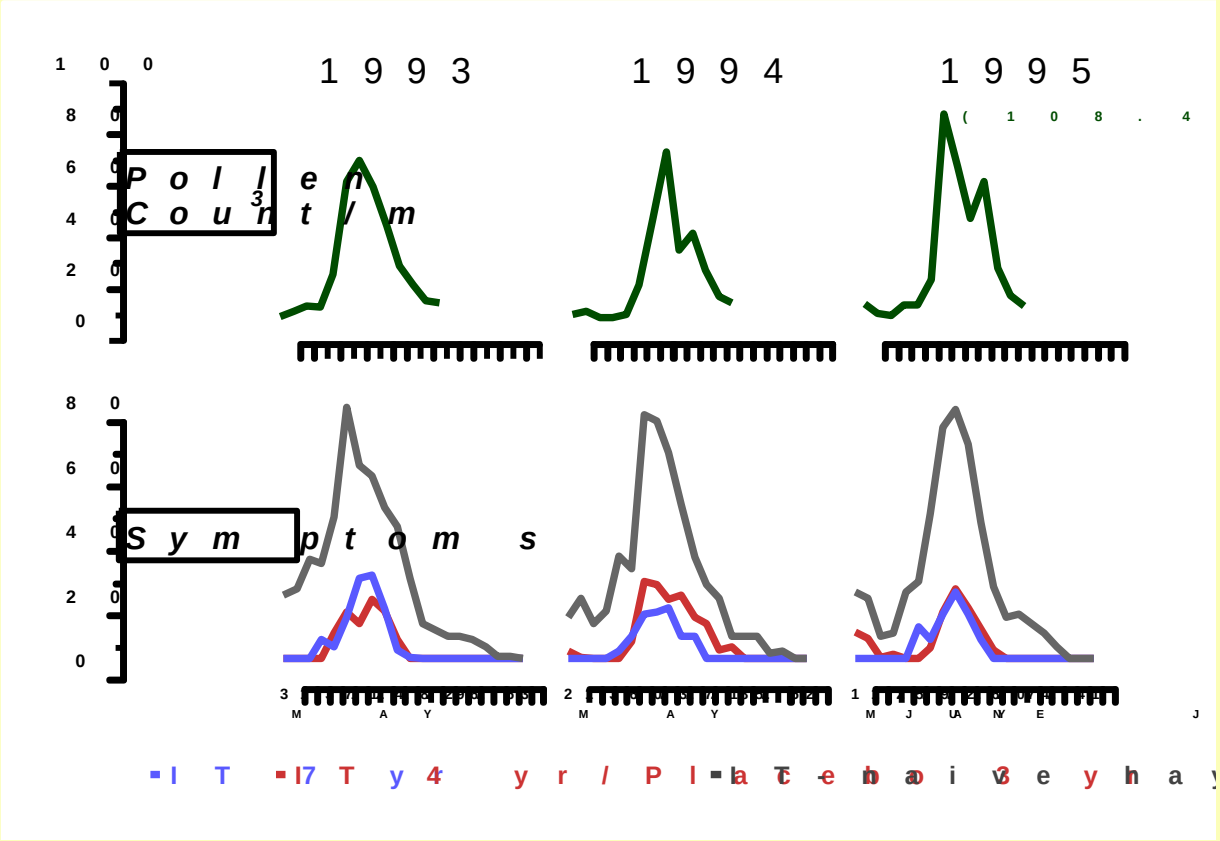
Efficacy of Immunotherapy in Allergic Rhinitis



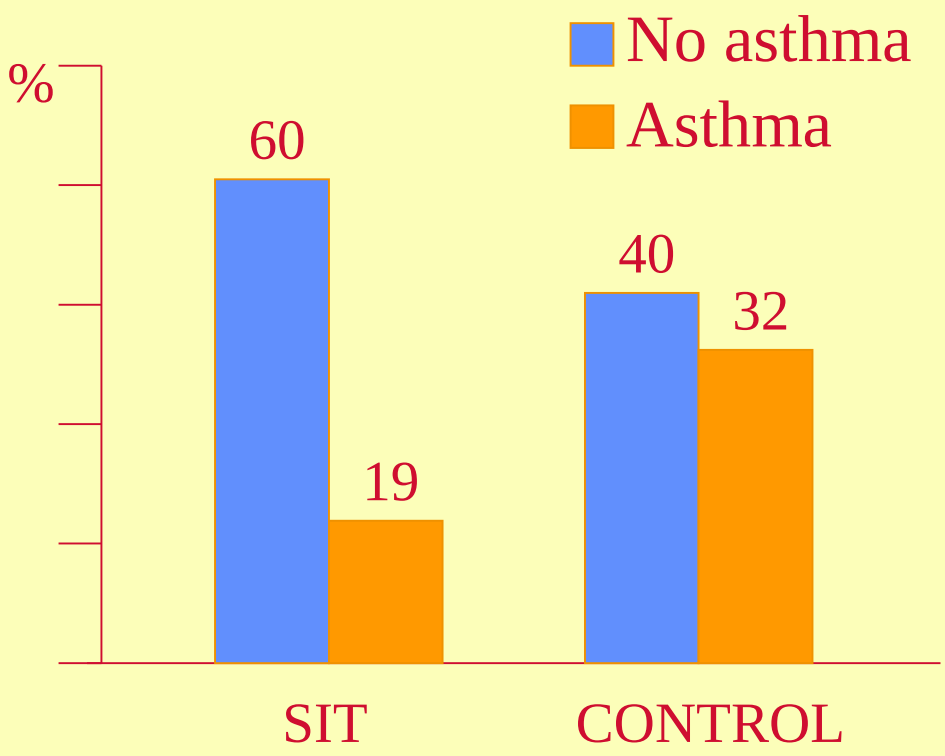


(Varney et al. *BMJ.* 1991;302:265-269.)

Long-term benefits of immunotherapy



Pre-emptive immunotherapy



205 children with rhinitis

age: 6-14 yrs

grass or birch allergy

3 yrs immunotherapy

Sublingual immunotherapy

Sublingual immunotherapy

Non-allergic rhinitis

- Prevalence upto 50%
- Pathogeneis not understood ?vasomotor
- Aggravated by alcohol, irritants, spicy foods
- No response to allergen avoidance or to desensitisation
- May respond to topical steroids, antihistamines or ipratropium

Rhinitis medicamentosa

- Common problem
- Occurs after 5-7 days of treatment
- Worse with topical decongestants
- Danger of septal perforation
- Treat underlying problem
- Use topical steroids or short course of oral steroids

Occupational allergic rhinitis

- Prevalence 5-15%
- Generally better on weekends, vacations
- Chemicals, latex, flour, animal products

Indications for referral to an allergy specialist

- Use of topical steroids on a daily basis
- Complications from treatment
- Failure to respond to treatment
- Multiple allergies
- Allergen identification assistance required
- Advice on allergen avoidance measures

Chronic sinusitis

- Symptoms present longer than 12 weeks in adults
- Eosinophilic inflammation or chronic infection
- Associated with abnormal sinus CT scans
- No response to oral antibiotics

Classification of bacterial sinusitis

- Acute bacterial sinusitis- infection lasting 4 weeks but symptoms resolve completely
- Subacute bacterial sinusitis- infection lasting between 4 to 12 weeks, but resolves completely
- Chronic sinusitis- symptoms lasting more than 12 weeks

Conditions causing chronic sinusitis

- Allergic and nonallergic rhinitis
- Samter's triad (AERD)
- Primary or secondary ciliary dyskinesia
- Cystic fibrosis- polyps
- Tumors- usually unilateral symptoms
- Immunodeficiency disorders
  - CVID, IgA deficiency etc
- Granulomatous diseases eg Wegener's
- Fungal sinusitis- controversial

Pathogenesis of nasal obstruction

- Viral and bacterial upper respiratory infections
- Allergic and nonallergic rhinitis
- Immunodeficiency disorders
  - CVID etc
- Anatomic factors
  - Deviated septum, concha bullosa, polyps

Mechanical obstruction

- Deviated nasal septum
- Concha bullosa
- Foreign body
- Nasal polyps
- Congenital atresia
- Lymphoid hyperplasia
- Nasal structural changes found in Downs syndrome

Primary and secondary ciliary dysfunction

- Kartagener's syndrome
- Tobacco smoke
- Viral URTIS
- Increased viscosity of mucus eg Cystic fibrosis
- Any cause of chronic sinus disease
- Drugs
  - Anticholinergics
  - Anesthetic agents
  - Benzodiazepines

Complications of chronic sinus disease

- Orbital- mechanical effects
  - Diplopia, proptosis
  - Periorbital erythema, swelling
- Bone erosions
  - Periosteal abscesses
- Brain invasion
  - Intracranial abscesses causing neurologic symptoms

Chronic sinus disease is associated with asthma

- Mechanism is not completely understood
- Failure to control upper airway inflammation leads to poor asthma control
- Post nasal drip is only one mechanism
- United airways disease ARIA

Testing in chronic sinus disease

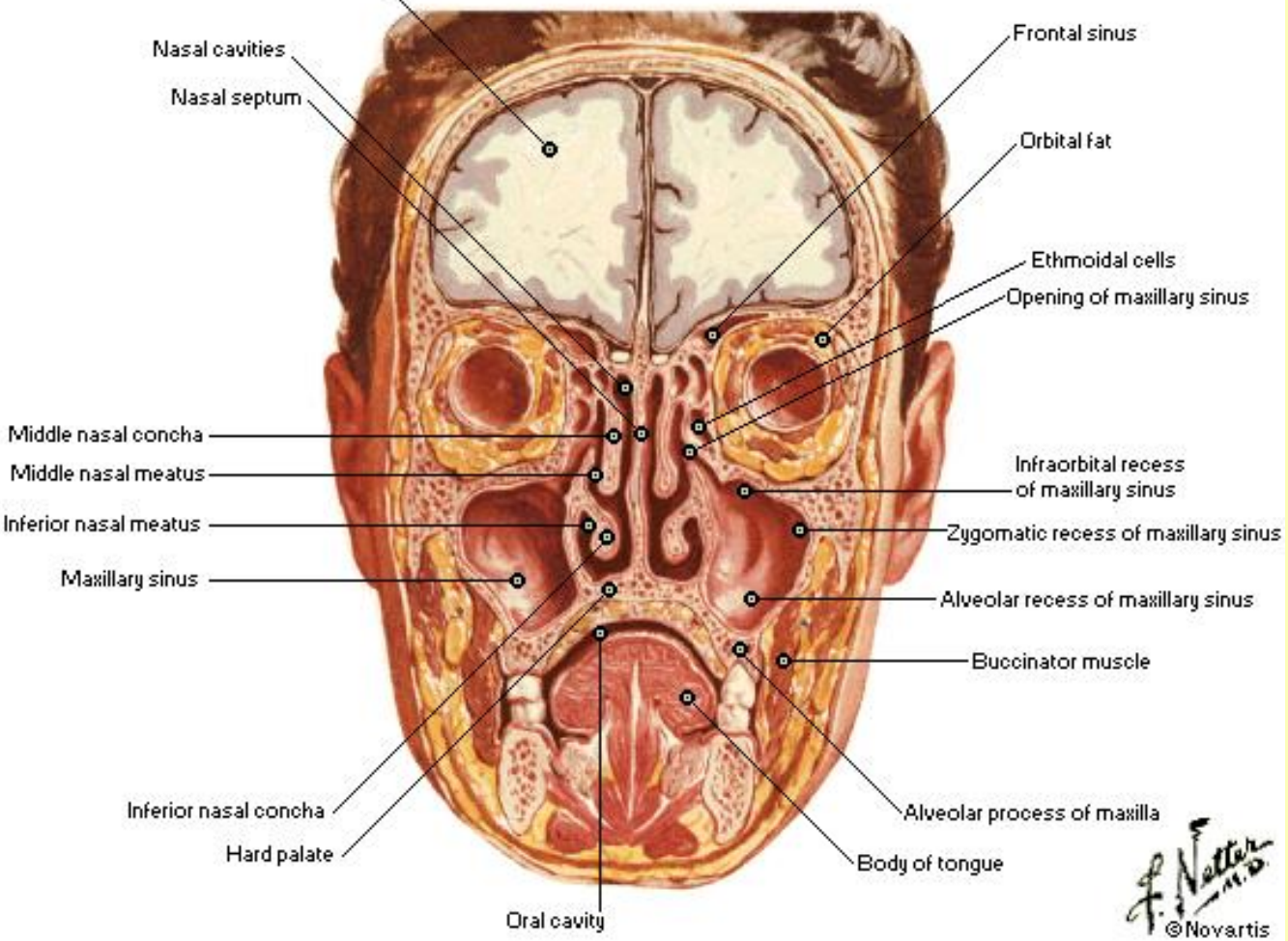
- CT or MRI

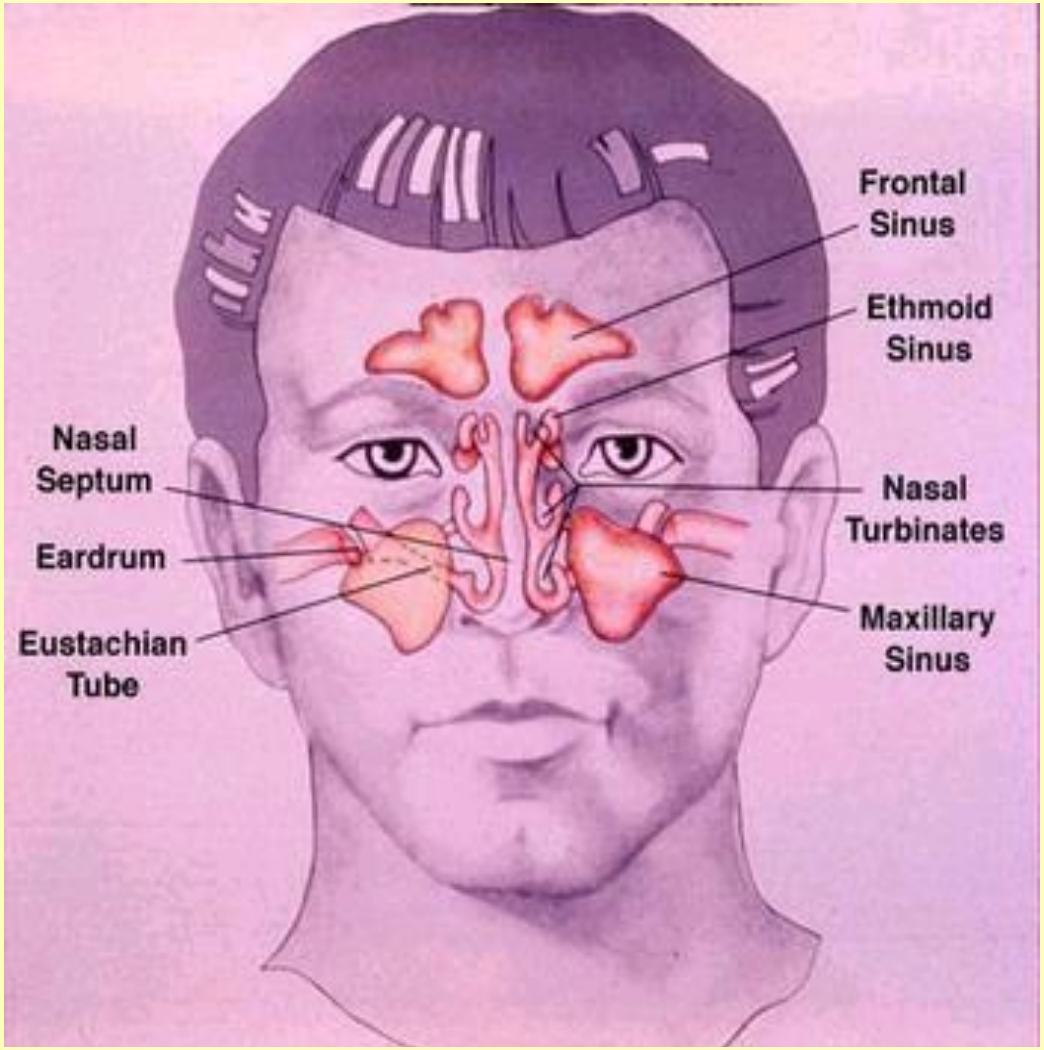
Anatomic defects, tumors, fungi

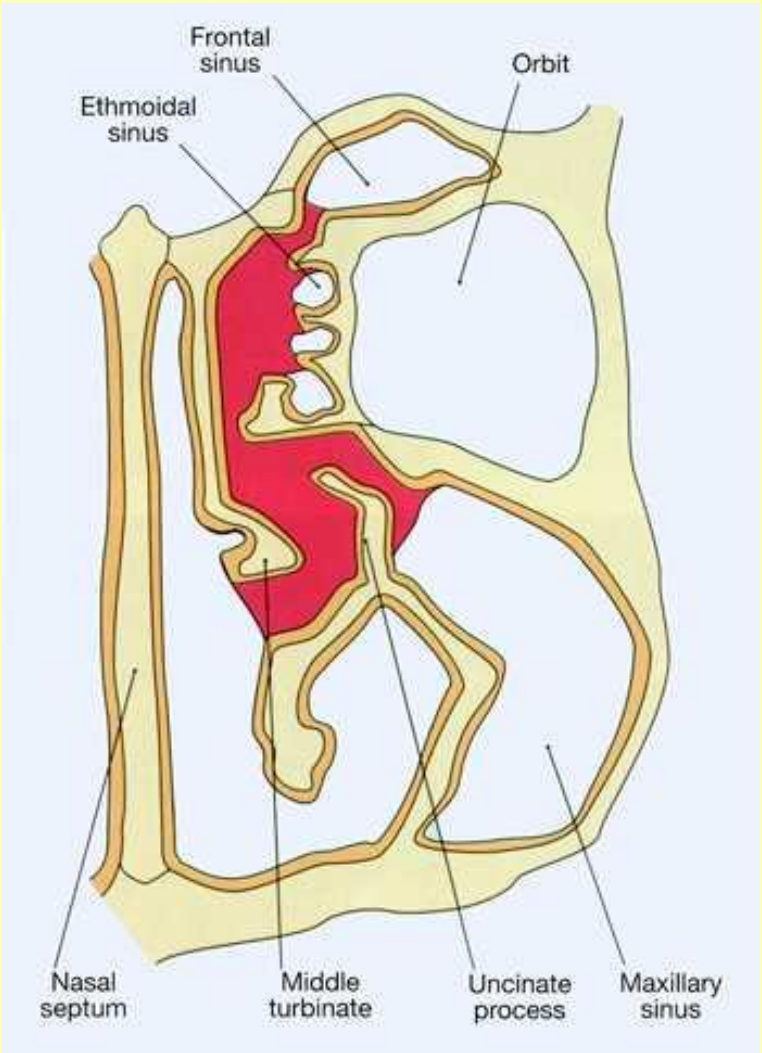
- Skin testing or specific IgE testing
  - Inhalants
- Sinus aspiration for cultures
- Immunoglobulins
- Aspirin challenge- AERD

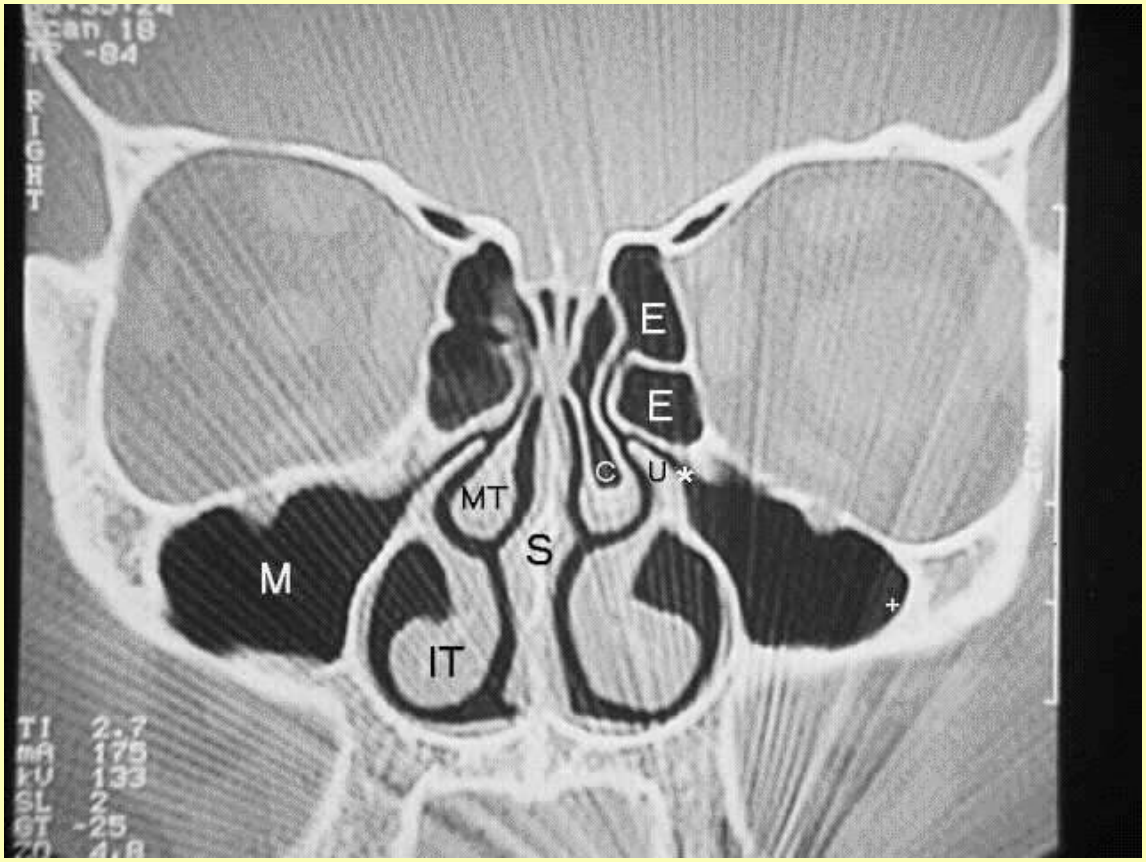
Paranasal Sinuses

Coronal Section




Frontal Sinus
Ethmoid Sinus
Nasal Septum
Nasal Turbinates
Eardrum
Maxillary Sinus
Eustachian Tube


Frontal sinus
Orbit
Ethmoidal sinus
Nasal septum
Middle turbinate
Uncinate process
Maxillary sinus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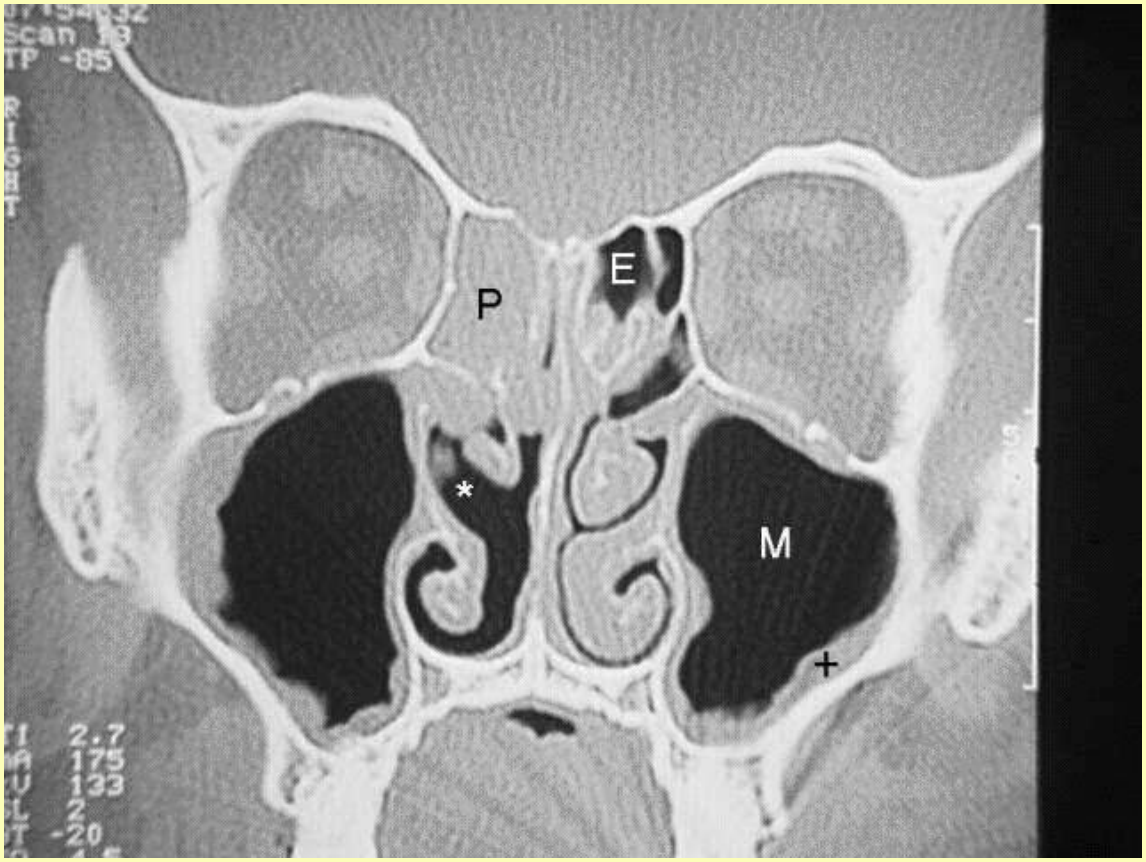
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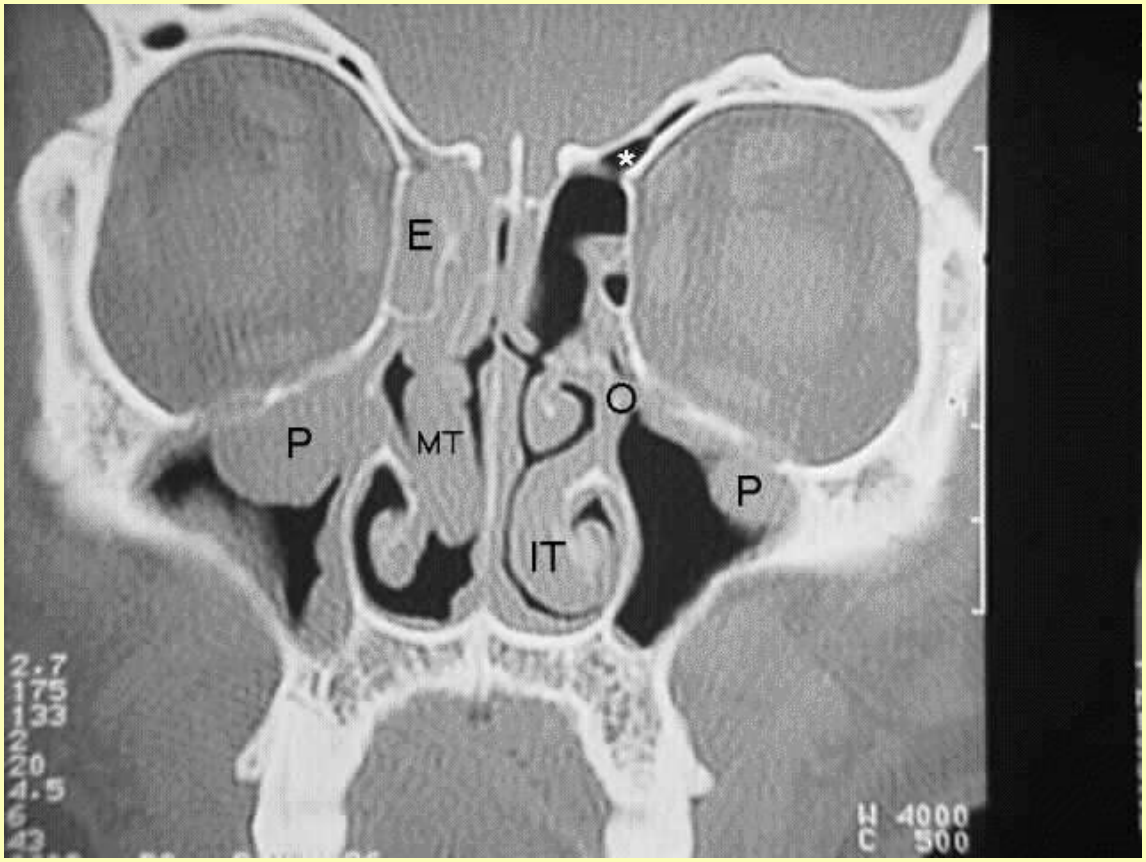
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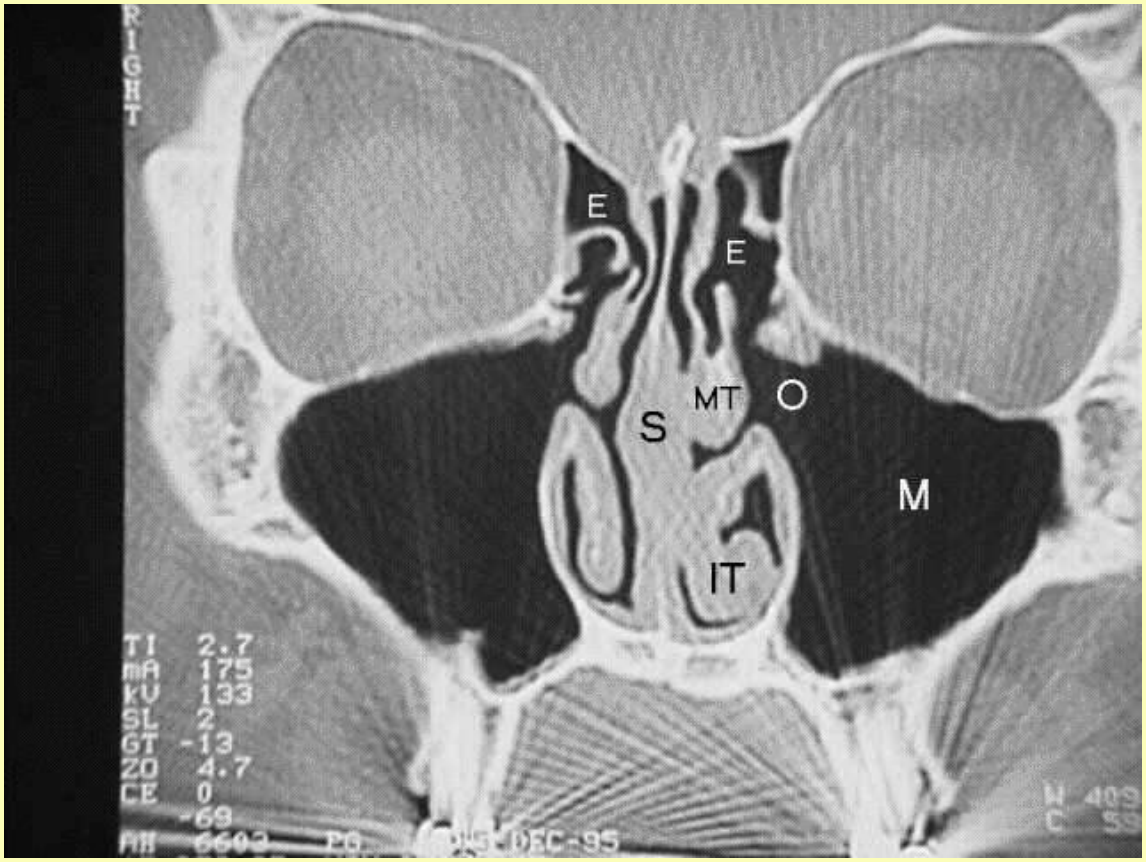
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Treatment of chronic sinus disease

- Nasal steroid spray
- Decongestants- temporary
- Steam inhalation
- Nasal irrigation- Neilmed or equivalent
- Antibiotics with exacerbations
- Ad hoc course of Itraconazole- fungal sinusitis
- Surgery

Samter's triad

- Nasal polyps
- Aspirin sensitivity
- Asthma
- May respond to Leukotriene antagonists or aspirin desensitisation

Case presentation Samter's triad (Aspirin exacerbated respiratory disease)

- Mr LW 36 yrs
- Symptoms: Blocked sensation, headaches and anosmia Minimal sneezing.
- Poor sleep, frequent waking, tired
- Perennial

Case presentation Samter's triad

- Asthma, frequent courses of prednisone
- Asthma worse with aspirin
- Reactions to Diclofenac also
- Skin testing negative
- CT scan pansinusitis and polyps
- Aspirin challenge not undertaken

Case presentation Samter's triad

- One month of oral prednisone
- Excellent but temporary response only
- Functional endoscopic sinus surgery and polypectomy
- Nasal steroids
- Low salicylate diet- temporary
- Monteleukast
- Aspirin desensitization

Indications for surgery in chronic sinus disease

- Anatomical problems eg polyps, foreign body
- Suspected malignancy
- Skeletal abnormalities eg deviated nasal septum
- Failure to respond to medical therapy
- Chronic sinus disease

Surgical procedures for chronic sinus disease

- FESS
- Septoplasy
- Polypectomy
- Partial turbinectomy
- Vidian nerve section
- Rhinoplasy
- Cautery of inferior turbinates

SUMMARY

- Chronic sinus disease requires a combined medical and surgical approach
- Identification of the underlying cause and treatment will reduce the risk of recurrence and need for future surgery.