APPENDIX A

SYLLABUS/CURRICULUM FOR ALLERGOLOGY SUB SPECIALIZATION

I. GENERAL CONCEPTS / BASIC SCIENCES

A. Definition of Allergy, Atopy, Hypersensitivity, Intolerance.
   1. World Allergy Organization Guidelines on “What is an Allergist”.
   2. World Allergy Organization “Requirements for Physician Training in Allergy 2006”

B. The Genetics of Allergic Disease, Asthma and the Allergic March
   E.g. Beta2 receptor polymorphisms, genes linked to allergic cytokines, asthma and steroid receptor genes.

C. Environmental Factors and Allergic Disease
   1. Allergen Nomenclature (biology, molecular biology of the major allergens [food, drug, aeroallergens], geographical distribution, cross-reactivity).
   2. Indigenous allergens in Southern Africa (Environmental Exposure):
      a) Indoor (e.g. house dust mites, cockroach, fungal, pets, latex, laboratory animals)
      b) Outdoor (e.g. aeroallergens, fungal spores)
      c) Pollutants (e.g. sulphur dioxide emissions)
      d) Adjuvants
      e) Aero biology / Pollen monitoring
      f) Allergen sampling (Burkard)
   3. Allergen vaccine, production, standardization, biological units, protocols, routes of administration, potency, shelf life, storage and regulatory approval for importation.

D. Immunology and Biochemistry of Allergic Disease
   1. Anatomy and normal physiology and function of the immune system
   2. The developing immune system and allergy
   3. IgE regulation: Specific IgE responses
   4. Cytokine and Chemokine regulation of the immune response (IL4, IL5, IL10, TGFB, IL13, ΔIFN)
   5. T-cells and allergy (TH1, TH2, Modified TH2 response, Regulatory CD25, T cells
   6. Early and late phase reactions
   7. The biology of mast cells, secretagogues and mediators
8. Immunoglobulins, IgG, IgM, IgA. Synthesis/half life
9. Complement system (C1 esterase inhibitor, C4)
10. Mouse models of allergens (knock out mice)
11. Biology of histamine
12. Diurnal variations of corticosteroids and C4 positive cholamines
13. Laboratory tests available to measure cytokines, chemokines and mediators.

E. Pharmacology / Pharmacokinetics
1. Antihistamines
2. Corticosteroids (different types: topical, oral, inhaled, intranasal, systemic, new steroids {ciclesonide, Momethazone INH})
3. Beta-2 agonists (SABA, LABA, Ultra LABA)
4. Anticholinergics
5. Leukotriene synthesis modifiers and leukotriene receptor antagonists
6. Anti-IgE
7. Theophyllines
8. Adrenaline (biology, half life, correct usage)
9. Combination therapy (corticosteroids + LABA, Corticosteroid + LTRAs)
10. Dosing in the young (drugs registered for paediatrics versus off label usage)
11. HFA vs CFA / spacers / delivery
12. New drugs for allergies (e.g. recombinant molecules, genetically modified molecules)
13. Calcineurin inhibitors (e.g. Pimecrolimus, Tacrolimus)
14. Immunosuppressants (e.g. cyclosporine, methotrexant)

F. Strategies for Prevention of Allergy
1. Identification of high-risk infants
2. Primary prevention
3. Secondary prevention / Avoidance of exposure
4. Allergy in pregnancy

G. Immunotherapy
1. History and objectives
2. Types of immunotherapy:
   a) Subcutaneous injection (SIT)
   b) Sublingual (SLIT)
   c) Peptide
   d) Recombinant
3. Mechanisms: SIT/SLIT
4. a) Indications and contra-indications
   b) Available vaccines
   c) Vaccines relevant in the RSA
5. a) Practical aspects
   b) Regulatory considerations
c) Protocols
6. Risks & Precautions
7. Duration
8. a) Follow up
   b) Quality of Life

H. Psychosocial effects on allergy
1. Epidemiology of allergic diseases in South Africa
2. Hygiene hypothesis
3. Effects of affluence
4. Family size
5. Obesity
6. Crèche exposure
7. Influence of viral infections

II. CLINICAL DISEASES

A. Asthma
1. Epidemiology: a) ISAAC Global
   b) South African Asthma Epidemiology
2. Aetiology / genetics
3. Pathophysiology
4. Allergy investigations
5. Lung functions / small airways
6. Diagnosis and clinical manifestations at different ages
7. Differential diagnosis
8. Prevention and therapeutic approach
9. GINA Guidelines and National Guidelines
10. Asthma control
11. Prognosis and risk factors for severe asthma
12. Special situations in asthma:
   a) Occupational
   b) Asthma under the age of 5
   c) Aspirin induced
   d) Immunotherapy and asthma
   e) United airway concept
13. Approach to chronic cough

B. (i) Allergic Rhinitis
(ii) Non Allergic, Vasomotor
(iii) NARES (non allergic rhinitis with eosinophilia)
1. Epidemiology
2. Aetiology / genetics
3. Pathophysiology
4. Diagnosis and clinical manifestations and differential diagnosis
5. Prevention and therapeutic approach (National Guidelines, ARIA Guidelines, monosensitive versus polysensitive, nasal cytology, rhinometry)
6. Prognosis

C. Sinusitis

1. Epidemiology:
   a) Acute
   b) Chronic
2. Aetiology / Association with allergy
3. Pathophysiology and organisms
4. Diagnosis and clinical manifestations in young children, in older subjects. CT scanning
5. Prevention and therapeutic approach.
   - Medical/Surgical referral criteria
   - Duration of treatment
   - Antibiotic recommendations
6. Complications

D. Nasal Polyposis

1. Pathophysiology and Aetiology
2. Diagnosis and clinical manifestations: Association with Aspirin sensitivity
3. Therapeutic approaches: 
   - Medical
   - Surgical referral indications
   - Desensitization
4. Prognosis

E. Food Allergy

1. Nomenclature and definitions of adverse reactions to food (Allergy, Intolerance, Toxic, Aversion)
2. Classification:
   a) IgE mediated
   b) IgE / Non-IgE mediated
   c) Non IgE mediated
3. Epidemiology
4. Aetiology / Major allergens:
   - Stable versus unstable allergens
   - Cross reacting allergens
   - Major food families
   - Profilins
5. Pathophysiology
6. Diagnosis and clinical manifestations
   - Anaphylaxis / Angioedema
   - Eczema
   - Elimination diets
- Skin prick tests
- RASTs
- Cut off values
- Open challenges
- Double blind placebo controlled food challenges

7. Specific syndromes:
   - Eosinophilic oesophagitis
   - Oral allergy syndrome
   - Latex / Food allergy syndrome

8. Prevention and therapeutic approaches
9. Prognosis
10. When to re-challenge (guided by in vitro or skin prick test cut off values)
11. Genetically modified foods
12. Common food additives and preservatives
13. South African food labelling laws

F. Atopic Eczema (Dermatitis)

1. Epidemiology: Prevalence
2. Aetiology / genetics: Adults vs Children
3. Pathophysiology:
   - Allergic March
   - Histology
4. Diagnosis and clinical manifestations:
   - Extensive
   - Flexural
   - Nummular
   - Nerodermatitis
5. Prevention and therapeutic approaches:
   - Role of food/diet
   - Topical steroids
   - Calcineurin inhibitors
6. Prognosis.

G. Contact Dermatitis

1. Epidemiology
2. Common contact allergens and sensitising agents
3. Pathophysiology
4. Diagnosis and clinical manifestations (including differential diagnosis with eczema):
   - Role of patch testing
5. Prevention and therapeutic approach:
   - Wet wraps
   - Emollients
   - Topical steroids
6. Prognosis
7. Referral to a dermatologist (UVB, biopsy, immunosuppressants)
H. **Urticaria**

1. **Classification:**
   - a) Acute
   - b) Intermittent
   - c) Chronic

2. **Aetiology:**
   - Physical
   - Allergic
   - Food additive induced
   - Autoimmune
   - Idiopathic

3. **Pathophysiology**

4. **Diagnosis and clinical manifestations (including differential diagnosis):**
   - Including elimination diet
   - Autoantibody to IgE receptor

5. **Prevention and therapeutic approach**

6. **Prognosis**

I. **Papular Urticaria and Other Insect Bites**

1. **Epidemiology**

2. **Pathophysiology**

3. **Diagnosis and clinical manifestations (including differential diagnosis)**

4. **Prevention and therapeutic approach**

5. **Prognosis**

J. **Angioedema**

1. **Epidemiology**

2. **Classification:**
   - Hereditary
   - Drug induced (e.g. ACE inhibitors)
   - Food additive induced
   - Idiopathic

3. **Pathophysiology**

4. **Diagnosis and clinical manifestations (including differential diagnosis)**

5. **Prevention and therapeutic approach:**
   - Management of life threatening angioedemas
   - Use of Danazol, EACA, use of concentrates (e.g. Berinert)

6. **Prognosis and long term follow up**

K. **Allergic Eye Diseases**

1. **Epidemiology**

2. **Classification:**
   - Allergen
   - Vernal conjunctivitis
   - Contact lens
   - Chemical (e.g. Benzalkonium chloride)
3. Pathophysiology
4. Diagnosis and clinical manifestations (including differential diagnosis)
5. Prevention and therapeutic approach
6. Prognosis

L. Drug Allergy
1. Epidemiology: - In general population
   - In high risk subjects (AIDS, cystic fibrosis)
2. Aetiology / genetics
3. Pathophysiology
4. Diagnosis and clinical manifestations:
   - Drug allergy testing (controlled, titrated skin prick testing, and in vitro tests)
5. Prevention and therapeutic options including desensitization / Medic Alert
6. Prognosis
7. Reporting of adverse drug events

M. Latex Allergy
1. Epidemiology.
2. Aetiology: - Health care workers
   - Spina Bifida cases
3. Pathophysiology
4. Diagnosis and clinical manifestations
5. Prevention
6. Occupational health aspects and notification
7. Development of hospital latex policies and latex free environments
8. Prognosis and containing the epidemic

N. Anaphylaxis
1. Epidemiology
2. Aetiology: - Allergic, Idiopathic, Exercise induced
   - Determination of serum tryptase levels
3. Pathophysiology
4. Diagnosis and clinical manifestations
5. Prevention and therapeutic approach: Correct use of Adrenaline
6. Education and prognosis
7. Resuscitation of anaphylaxis

O. Occupational Asthma and Allergies
1. Epidemiology
2. Aetiology: Allergic/Irritant
3. Diagnosis and monitoring
4. Notification: The Occupational Health Act / COIDA
5. Compensation process
6. Prevention and management

P. **Allergies of the Gastrointestinal Tract**
   1. Oral allergy syndrome
   2. Allergic / eosinophilic oesophagitis
   3. Milk induced enterocolitis
   4. Food intolerances
   5. Allergic colitis
   6. Gastro oesophageal reflux

Q. **Miscellaneous Allergic / Immunological Diseases**
   1. Mastocytosis
   2. Immune deficiency disorders:  
      - IgG deficiency
      - IgG subclass deficiency
      - C1 esterase inhibitor deficiency
      - C6 deficiency
   3. Hyper IgE syndrome
   4. Hyper IgM syndrome
   5. Allergy in HIV and AIDS
   6. Allergy to vaccines

R. **Special Consideration in Allergy and Asthma**
   1. Pregnancy
   2. Infancy, especially milk allergies, substitutes and natural history

S. **Future Therapies**
   1. Therapy directed against mediators
   2. Gene therapy
   3. Immunomodulation

**III. ALLERGY EVALUATION AND DIAGNOSTIC PROCEDURES**

A. **History Taking in Allergy**
B. **Physical Examination**
C. **Pulmonary Function Testing**
1. Static lung volumes
   a) Spirometry

2. Flows and timed volume
   a) Peak expiratory flow
   b) Forced expiratory volumes
   c) Maximal expiratory flow volume curve

3. Airway responsiveness
   a) Bronchodilator response test
   b) Bronchoprovocation (challenge testing)
   c) Exercise testing

4. Interpretation of pulmonary function tests

D. Airway Inflammation
   a) Fractional exhaled nitric oxide
   b) Inflammatory markers in induced sputum and serum (ECP, IL-5, Tryptase, etc.)
   c) Urinary leukotrienes
   d) Determination of leukotrienes in exhaled breath condensate

E. Nasal Cytological Examination
   1. Examination of nasal cavity (head lamp)
   2. Sampling technique and processing of nasal specimens (blowing, swab, lavage, scrapings)
   3. Fixation and staining (for eosinophils and neutrophils, e.g. Hansels stain)
   4. Microscopic examination (in collaboration with Haematology laboratory)

F. Laboratory / Diagnostic Studies
   1. Sensitivity, specificity, positive and negative predictive values
   2. Phadiatope, Fx5E
   3. CAST testing (sulphido leukotriene release assays)
   4. Skin-prick testing
   5. Atopy patch test
   6. Induced sputum
   7. Oximetry
   8. Audiometry
   9. Micro array techniques (new)
   10. IgE (Immunocap), Total IgE
   11. Serum tryptase
   12. Western blotting / dot blotting
   13. Basophil histamine release tests
   14. Staining for eosinophils and application of eosinophilic cationic protein in nasal smears, sputum
15. C1 esterase inhibitor functional and antigenic assays
16. Reference values, co-efficient of variation, Quality control of the allergy laboratory

G. Elimination – Challenge Testing in Food Allergy
1. Basic elimination diet
2. Open challenges
3. Single – blind challenges
4. Open challenges
5. Double blind placebo controlled food allergy challenges (DBPCFC)

H. Evaluation of Drug Allergy
1. Clinical: - Allergic (Type I)
   - Other adverse reactions
2. In vitro tests (IgE, CAST, flow CAST)
3. In vivo tests (skin prick titrated tests)
4. Ancillary tests (controlled challenges)

I. Desensitization for Drug Allergy (Protocols)
1. Antimicrobials (e.g. Penicillin, Cephalosporin, Trimetoprin)
2. NSAID’s (Aspirin)
3. Immunosuppressive agents
4. Insulin
5. Miscellaneous (other drugs)

J Imaging
1. X-ray studies
2. Computed tomography (CT scan) and limited CT scans
3. Ultrasonography
4. Nuclear medicine

K Quality of life in allergic diseases
1. Rhinitis
2. Atopic eczema
3. Chronic urticaria
4. Asthma
5. Food allergy

The use of validated specific quality of life indices (e.g. Juniper for Rhinitis or SF36) in assessment and monitoring of allergic interventions in the above diseases
IV. RESEARCH METHODS

1. Basic statistics: Parametric / Non parametric tests
2. Research design and computer literacy: Use of medical search engines
3. Clinical audits / Record keeping / Allergy databases
4. Clinical trials / GCP
5. Evidence – based methods / Levels of evidence / Cochrane database
6. How to write a paper: The candidate would be expected to conduct a literature review, design and conduct a self initiated supervised allergy research project during the 2 year training period, analyse the results, presentation of work at a congress and to submit the research for publication.

V. PLANNING NATURAL AND REGIONAL SERVICES IN ALLERGY

1. Primary health care
2. Secondary or regional hospitals
3. Tertiary services in allergy
4. Education in allergy (undergraduate and postgraduate)