The Hong Kong College of Paediatricians

Paediatric Immunology and Infectious Diseases 兒童免疫及傳染病科

Document 3:

Guidelines on Training and Development of the PIID Subspecialty

A. The PIID Subspecialty Board: terms of reference, membership, operation

1) The Board is
   a) to uphold and improve the standard of Paediatric Immunology and Infectious Diseases service in Hong Kong
   b) to improve knowledge, practice, teaching and research in the field of Paediatric Immunology and Infectious Diseases
   c) to promote the concentration of specialized expertise and facilities to improve access of care
   d) to establish a close understanding and working relationship with other disciplines
   e) to encourage coordinated management of relevant clinical services throughout the region
   f) to strive for local, regional and international recognition of Paediatric Immunology and Infectious Diseases as a subspecialty
   g) to formulate and to establish training guidelines
   h) to assess, to accredit and to monitor training centres, training programmes, trainers and trainees
   i) to coordinate continuing medical education in the field of Paediatric Immunology and Infectious Diseases
   j) to organize and to conduct subspecialty examination with the authorization of the Council of Hong Kong College of Paediatricians
   k) to recommend to the Council of Hong Kong College of Paediatricians and Hong Kong Academy of Medicine candidates for the award of Subspecialist in Paediatric Immunology and Infectious Diseases

2) The Board is
   a) under the auspices of Subspecialty Board and the Council of Hong Kong College of Paediatricians
   b) to liaise with Education Committee on issues regarding training and examination of the subspecialty in Paediatric Immunology and Infectious Diseases
   c) to be composed of 5-6 members of which a majority being Paediatric Immunology and Infectious Diseases subspecialists. The subspecialist

members should be elected amongst those First Fellows registered with the Hong Kong College of Paediatricians. There should be at least one general paediatrician or other subspecialist in the Board, who is appointed by the Council of Hong Kong College of Paediatricians. If possible, at least one member would come from each of the universities, Hospital Authority, and Private Sector. The term of office of Board Members would be 3 years.

d) to be chaired by a chairperson who is elected among the Board members every 3 years and appointed by the Council. The chairperson should be a Paediatric Immunology and Infectious Diseases subspecialist and the term of office will be 3 years. The chairperson is eligible for election for a maximum of 3 consecutive terms.

B. The PIID Training Programme:

a. Objectives

Paediatric Immunology and Infectious Diseases subspecialists after completion of the training programmes should have acquired comprehensive knowledge and skills in the subject. They (1) are clinically competent in the field of PIID, (2) are capable of working in a variety of settings, and (3) possess habits of life-long learning to build upon their knowledge, skills and professionalism.

1. Clinical competence is defined as:

   a. A basic core knowledge of the clinical manifestations, pathophysiology, management and prevention of paediatric immunological and infectious diseases. This knowledge base should include an appropriate content of anatomy, genetics, biochemistry, physiology, pharmacology, epidemiology, statistics, ethics, and human behavior relative to the practice of PIID.

   b. The clinical skill of data collection including history-taking, physical examination and the appropriate request of laboratory and imaging studies.

   c. The ability to formulate appropriate differential diagnoses and therapeutic plans based on an ability to critically analyze the clinical data, and integrate this analysis with the basic foundation of medical knowledge.

   d. The ability to perform as a consultant or a healthcare team leader when summoned.

   e. The knowledge to treat the common and uncommon diseases found in the practice of PIID - To develop the understanding of the principles,

indications, contraindications, risks, costs and expected outcomes of the various treatments; To recognize the need for appropriate consultation and the reasonable expectations from a consultant.

f. The performance and/or interpretation of diagnostic and therapeutic procedures common in the practice of PIID. This skill should include the understanding of the principles, indications, contraindications, risks, costs and expected outcomes of these procedures.

g. The further development of communication skills with patients, peers and allied health professionals.

h. The further development of qualities of professionalism and humanistic skills including integrity, ethics, compassion, willingness to teach and inspire juniors, and respect for patients, peers and allied health professionals.

i. Competent PIID subspecialists must possess a level of skill and expertise in research. All fellows must be capable of demonstrating competence in the understanding of the design, implementation and interpretation of research studies; specifically including research methodology, critical interpretation of data, critical interpretation of published research, and the responsible use of informed consent.

2. The ability to work in a variety of settings is desirable. The fellows will be able to demonstrate clinical competence in the following settings:

   a. As the primary healthcare provider in the acute inpatient setting, the ambulatory clinic, the emergency department, and the intensive care setting

   b. As the consultant to other general paediatricians or other physicians in the acute inpatient setting, the ambulatory clinic, the emergency department, and the intensive care setting

   c. As the leader of a multidisciplinary healthcare team

3. Life-long learning is an essential component for clinically competent physicians and required for the acquisition, critical analysis, synthesis and assessment of knowledge, skills and professionalism. All fellows will be capable of demonstrating their ability to be life-long learners by their:

   a. Independent study habits in the acquisition of clinical and research knowledge and skills

   b. Attendance, presentation and participation in the organization of local educational conferences

c. Attendance and presentation at regional and international professional scientific conferences

d. Commitment in the design, implementation, analysis and reporting of clinical audits and research projects

b. Curriculum (knowledge, skills, attitudes)

Knowledge

By the end of training, all trainees will:

- know and understand the ontogeny of the immune response in children
- know and understand the classification of immunodeficiencies
- know and understand the clinical manifestations of the different types of immunodeficiency
- know and understand the diverse conditions and treatments which result in secondary immunodeficiencies
- know and understand the pathophysiology and the principles of treatment of allergic and autoimmune disorders
- know and understand the basis of the immune system including the innate and specific adaptive systems
- understand the developmental aspects of immunity and their relevance to susceptibility to infections in infants and young children
- understand the rationale underlying immunisation strategies in children, including active and passive immunisation
- understand the development and modes of action for active and passive immunisation
- know about routine immunisation schedules as well as immunisation in special situations, for example immunisation of the immunocompromised host
- understand the mechanisms of autoimmunity
- understand the different types of infection commonly associated with different kinds of immunodeficiency
- know when to use chemoprophylaxis and immunoprophylaxis, and which to use
- understand the principle of immunomodulatory therapy
- know about novel, emerging and re-emerging infectious diseases, as well as diseases with a possible infectious aetiology such as Kawasaki disease, chronic fatigue syndrome and haemophagocytic lymphohistiocytosis
- know the principles and details of epidemiology of infectious diseases and be able to apply them
- know and understand how to investigate and manage infections with specific microorganisms
- know and understand about specific infections in the immunocompromised child
- know and understand the complexities of the relationship between the host and infecting organisms
- know and understand the management of situations where the host immune response to infection has triggered a pathological inflammatory response

- know and understand the management of situations where the host inflammatory response has been triggered by a non-infectious condition
- know and understand the principles of quality control in laboratory testing

Emphasis on Infectious Diseases:

- know the fundamental classification of infectious agents and basic microbiological characteristics, especially an understanding of virulence factors, culture requirements and inherent drug resistance
- have an understanding of serological and molecular diagnostic tests for various infectious diseases
- know the pathogenesis of infection and infectious injury, including: bacterial (especially sepsis, septic shock and toxic shock syndromes), viral, fungal, protozoal and helminthic diseases
- know the pathogenesis of immunological disorders with probable infectious aetiology
- know the local, regional and global epidemiology of infectious diseases including novel, emerging and re-emerging infectious diseases (e.g. influenza A H5N1, SARS, EV71), zoonoses and multi-drug resistant microorganisms (e.g. MRSA, MDRTB, XDRTB)
- have thorough understanding of therapeutics in infections and primary and secondary immunodeficiencies (e.g. patients with malignancy, haematopoietic stem cell / bone marrow or organ transplantation, HIV/AIDS) including use of antimicrobials both therapeutically and prophylactically, rationale for usage and interpretation of sensitivity tests (including minimum inhibitory and bactericidial tests), pharmacokinetics of antimicrobials, therapeutic drug monitoring, hospital antibiotic stewardship programmes, and hospital antibiotic policies
- know the principles and practicalities of infection control in hospital settings, including prevention of nosocomial infections (e.g. catheter-related infections, ventilator-associated pneumonia, multi-drug resistant bacterial infections) and outbreaks of common childhood infections in the hospital (e.g. RSV, rotavirus, norovirus, measles and chickenpox) , handling and care of intravascular catheters, and handling of biohazardous specimens
- know the principles and practicalities of infection control in community settings, including notification programmes, disease surveillance, preventive measures (e.g. contact tracing, outbreak control) and statutory requirements in the management of infection
- know the details about immunisation, including global importance of vaccination programmes and new developments in vaccinology
- know about the investigation and management of travel-related infections and imported infectious diseases of global, regional and local importance, and how to advise on travel health (e.g. personal protection and hygiene, anti-malarial measures, pre- and post-exposure prophylaxis)
- know about the recognition, diagnosis, investigation, treatment and prevention of infections in different situations, such as life-threatening infectious emergencies, zoonoses, occupational exposures, nosocomial transmissions, and biological attack / bioterrorism

Emphasis on Immunology:

- know the structure and function of the specific and non-specific immune systems, especially the basis of normal and abnormal immunological

responses to microbial infections and the developmental aspects of such responses
- know the laboratory basis of immune function tests and the diagnosis of immunological disorders
- know the classification and diagnosis of primary immunodeficiencies on both the phenotypic and genetic levels.
- know the use of immunomodulating agents – corticosteroids, immunoglobulins, cytokines, growth factors and immunosuppressive drugs
- know the role of haematopoietic stem cell / bone marrow transplantation and gene/cellular therapy in the management of immunological disorders
- understand the cellular and molecular pathology of common allergic diseases
- understand the epidemiology, clinical history and natural history of common allergic conditions
- know and understand the ontogeny of the allergic immune response in early life
- know and understand basic allergic mechanisms
- know and understand local tissue responses in allergic diseases
- know and understand the immunopathogenesis of the immediate and late phase allergic response
- know and understand the way in which allergy, allergen exposure and infection interact and manifest as disease
- know and understand the relationship between immunodeficient states and allergic disease
- know about primary and secondary prevention of atopic disease
- know and understand about cross-reactive antigenic determinants and know common cross-reactivities
- know and understand the use and limitations of skin-prick testing and measurement of total and specific IgE
- know the value of diagnostic allergy testing set against the advantages and problems of direct organ challenge
- know about the epidemiology, clinical presentations and risk factors for autoimmune conditions in children and adolescents
- know and understand current theories on aetiopathogenesis of autoimmune diseases
- Know and understand the relationship between immunodeficiencies and autoimmune diseases
- be aware of the extra-articular associations of rheumatologic conditions, in particular juvenile arthritis and eye disease
- know the epidemiology, spectrum of clinical presentation and laboratory features that constitute multi-system autoimmune diseases
- know how to assess the clinical features and function of all potential target organs that may be involved in autoimmunity, including acute and chronic conditions

Skills

By the end of training, all trainees will:

- be capable of providing independent consultation to patients with infectious and immunological diseases
- be capable of providing continuity of care and out-patient follow-up of individual patients whom they have managed during consultation
- know about and have experience in caring for patients with intravascular catheters
- have experience working in clinical microbiology, virology or immunology laboratories so as to understand the range and limitations of diagnostic tests available
- know how to obtain and handle appropriately the necessary diverse clinical specimens for diagnosis of infectious and immunological diseases
- understand immune function testing and be able to interpret the results including specific antibody assays, complement, phagocytic cell and T cell tests
- understand and be able to request for molecular genetic tests available for diagnosis of primary immunodeficiencies
- be able to interpret relevant ancillary diagnostic tests such as radiologic imaging studies and lung function tests
- have developed links with laboratory staff so as to become familiar with the practicalities and personnel involved in the performance of tests such as cultures, microscopy, rapid antigen detection, polymerase chain reaction, immunoglobulin assay and flow cytometry
- be capable of liaising and cooperating with the hospital infection control team and public health officials in the surveillance, investigation, prevention and control of nosocomial infections and outbreaks of infectious diseases
- be able to present a clinical audit and have participated in drafting a clinical guideline or protocol for management of a specific infectious or immunological disease under the supervision of a trainer

Emphasis on Infectious Diseases:

- be able to assess and initiate acute and long-term management of patients presenting with immunological and infectious diseases including emergency management of life-threatening infections and coordination of care for the critically ill
- be able to investigate and manage infections with specific micro-organisms
- be able to investigate and manage infections of the foetus and newborn
- be able to investigate and manage the protean presentations of tuberculosis in a child and its contacts
- be able to investigate and manage infection and/or inflammation of specific organ systems
- be able to use appropriate treatments for infectious agents, including antibacterials, antivirals, antiretrovirals, antifungals, and anti-parasitic agents
- be able to investigate and manage systemic infections and/or inflammation, including sepsis, septic shock and toxic shock syndromes

- have experience in the management of HIV/AIDS in infants and children, be able to manage HIV in pregnancy to prevent transmission to the fetus, and be able to coordinate multidisciplinary management of the child and family affected by HIV/AIDS
- be able to investigate and manage infections in the immunocompromised host including those undergoing bone marrow transplantation and/or solid organ transplantation (e.g. severe or disseminated infection with herpes group of viruses, invasive mycosis, disseminated mycobacterial infection, *Pneumocystis jirovecii* pneumonia)
- be able to investigate and manage fever of unknown origin or fever without localizing signs, periodic fever syndromes, opportunistic infections, recurrent infections, travel-related infections and imported infections (e.g. malaria, dengue fever)
- be able to retrieve, synthesize, review, interpret, discuss and apply current information on infectious disease epidemiology and guidelines on clinical management, prevention and control of infectious diseases in a knowledgeable manner in day to day clinical practice
- be able to supervise and carry out infection control and proper personal protection in the management of patients infected with transmissible agents, especially highly infectious agents capable of transmission by the airborne route

Emphasis on Immunology:

- be able to recognize the different patterns of clinical presentation of primary and secondary immunodeficiency disorders, investigate with laboratory testing, interpret the findings, and institute appropriate management
- know when to investigate children with recurrent infections, autoimmunity, fever allergy and or malignancy for primary immunodeficiencies
- be able to understand and interpret laboratory tests for diagnosing primary immunodeficiencies, such as innate and specific immune cell function test and genetic mutation analysis.
- Be able to use various treatment modalities for primary immunodeficiencies including chemoprophylaxis, immunoprophylaxis, immunosuppressants, biologics, hematopoetic stem cell therapy and specific cellular therapy.
- know the specificity, sensitivities and predictive values of skin-testing and in vitro IgE antibody measurement for individual allergens
- ensure that guidelines for the management of anaphylaxis are implemented
- be able to recognise multiple presentations of food allergy
- be able to interpret a dietary diary and be able to advise about its management, including the risks and benefits of avoidance diets, use of alternative and hypoallergenic milk formulas and a hypoallergenic weaning diet
- know the indications for food challenges, challenge protocol procedures (open, single blind and double blind placebo controlled) and safety precautions

- be able to use measurements of specific IgE and skin test results to optimise the timing of food challenges
- know the relationship and cross-reactivities between food, pollen and food, and latex and be able to advise patients appropriately
- know how to assess future risk of allergic reactions and which patients require the prescription of injectable adrenaline
- understand the role of allergen triggers and avoidance in the pathogenesis and
  management of eczema and be able to advise patients appropriately
- be able to examine and assess the severity of eczema in an affected child
- know the sensitivity and specificity of measuring total and specific IgE and skin testing in children with eczema and be able to investigate them appropriately
- be able to manage patients with severe eczema including the use of emollients, anti-inflammatory preparations and wet wraps
- know the indications for, limitations of and protocols for drug challenges and desensitisation

Attitudes

- Appreciation of the scope and limitations of microbiological, virological and immunological investigations.
- Appreciation of the need to participate in formulation of clinical guidelines and protocols for infectious and immunological diseases to maintain the standard of care.
- Appreciation of the importance of infection control in the hospital and community, as well as prevention of infectious diseases globally.
- Appreciation of the need for cooperation with infection control personnel and public health officials in the control and prevention of community and hospital acquired infections
- Understanding the importance of appropriate, effective and timely communication with children, parents, colleagues and other healthcare professionals.
- Willingness to contribute to team work, and interact and liaise with various disciplines such as adult infectious disease specialists, microbiologists, virologists, immunologists, radiologists, pathologists, other paediatric organ specialists, general paediatricians, family physicians, general practitioners, pharmacists, epidemiologists, researchers, academics, public health officials, and hospital infection control team in delivering an integrated infectious disease and immunology service.
- A supportive approach to supervision and training of junior staff, and influence by role modelling.
- Appreciation of the need to develop quality as a team leader in mobilizing input from allied medical professionals including clinical

psychologists, physiotherapists, occupational therapists, nurses and medical social workers.

- Commitment to self-directed continuous professional development and fostering a scholastic approach to maintain understanding of recent advances and current concepts of the subspecialty over a professional lifetime.
- Keen interest in participating in the formulation of clinical guidelines and protocols for better management of infectious and immunological diseases.

c. Requirements of the training programme (format, duration, logistics of assessments)

Programme for paediatric immunology and infectious diseases training

The Paediatric Immunology and Infectious Diseases (PIID) subspecialty training programme offers a 3-year training programme in Hong Kong. It is formed by a network of hospitals to optimize the training opportunities.

Candidates must have completed 3 years basic training in general paediatrics and have passed the Joint MRCPCH (UK) / Hong Kong College of Paediatricians Intermediate Examination. One overlapping year with higher training in general paediatrics is allowed when they are deemed eligible for commencing the subspecialty training with the approval of the Subspecialty Board of PIID. (NB: At the Training Programme Director and Subspecialty Board's discretion, a degree of flexibility is allowed to recognize a cumulative period of one year of subspecialty training during the three years of Higher Training in General Paediatrics).

Applications from candidates seeking academically oriented training with an interest in basic or clinical research are encouraged.

The curriculum is designed to train candidates in an environment which prepares them to provide outstanding clinical care and to develop the fundamental skills with which to pursue a life-long career in the relevant subspecialty. The first 2 years of training include inpatient and outpatient clinical rotations in at least 2 of the following 4 regional hospitals: Princess Margaret Hospital, Prince of Wales Hospital, Queen Elizabeth Hospital, and Queen Mary Hospital.

All trainees would undergo mandatory core training of 12 months of Immunology module (of which 6 months would be rotated to an accredited Immunology training centre with bone marrow transplantation, currently QMH and PWH) AND 12 months of Infectious Diseases module (of which 6 months would be spent in the Infectious Disease Centre of PMH). Trainees are encouraged to have a balanced exposure of ID and Immunology through the

2-year core programme. The Training Programme Director holds responsibility to steer the training profile of individual trainee prospectively.

All trainees are advised to receive 6 months of overseas training in infectious disease / immunology at tertiary referral centres, and another 6 months of elective training in related disciplines. Prior approval of these programmes by the Training Programme Director is required.

Training should be competence based that integrates clinical care with small group tutorials, clinical case write-ups, postgraduate courses, journal clubs, clinical and/or laboratory meetings, interdisciplinary conferences, and grand rounds. During the 3-year training, trainees are encouraged to pursue basic or clinical research projects. Supervision is provided by trainers who have achieved stature as clinicians, educators, and scientists.

Obtaining the qualification of a postgraduate diploma or degree (e.g. MSc, MPhil, PhD or MD) related to Immunology and/or Infectious Diseases may also be recognized as completion of training for up to a maximum of 6 months subject to approval by the Training Programme Director.

Regarding the requirement of trainees being in “full time subspecialty training”, it is agreed that the minimum requirement would be more than 50% of the time in his/her daytime duties.

Methodology for Teaching PIID

In order to achieve the goals and objectives for the competence based fellowship program the following experiences have been established for the purpose of teaching PIID fellows. These include:

A) Inpatient PIID experience

B) Ambulatory PIID experience

C) Interdisciplinary interactions

D) Didactic conferences

E) Research experience

F) Continuing medical education and participation in professional societies

G) Development of teaching skills

H) Case reports / Case write-ups

A) Inpatient PIID experience

The fellows assigned to this rotation will be responsible for organizing the activities of this service. This primarily includes the supervised evaluation of inpatient consultations and patients admitted to the PIID service as well as the continued follow-up of these patients during their hospitalization. Essential in this role is the development and refinement of clinical evaluation competences for patients with PIID. These competences include the formulation of appropriate differential diagnosis, assessment of the need for hospitalization, and development of diagnostic evaluation strategies and treatment plans. Essential in this rotation will be developing skills in providing consultation services, to include communicating with the referring physicians and ensuring support for continued care of the patients. A fellow will be called upon to perform literature search on topics appropriate to the case at hand. They will participate actively in the teaching activities of the consultation team. Through this experience the fellow will also develop a comprehensive understanding of the indications, contraindications, techniques and complications of various procedures, as well as the interpretation of results from such procedures. The fellow will also acquire the knowledge and skills in educating patients about the procedure and in obtaining informed consent. Supervision by trainers is required in developing these competences.

B) Ambulatory PIID experience

All fellows will be required to attend at least one subspecialty clinic session per week for the 24 months looking after patients with PIID. This experience will continue with progressive responsibility during the fellowship training and will be appropriately supervised by dedicated trainers. The goal of this experience will be for the fellows to gain competences in the outpatient evaluation and management of PIID problems. The experience provides an opportunity to develop an understanding of the natural history of these conditions over an extended period of time.

C) Interdisciplinary interactions

The fellow should be provided elective training in other disciplines whose experience is required for the care of patients with PIID. These disciplines may include: (1) adult infectious disease, immunology, allergy, transplantation or rheumatology (2) HIV/AIDS medicine (3) tuberculosis and chest medicine (4) sexually transmitted disease, venereology or genitourinary medicine (5) critical care (6) haematology / oncology (7) nephrology (8) dermatology (9) public health such as experience within Centre for Health Protection (e.g. Surveillance and Epidemiology Branch or Infection Control Branch) (10) microbiology, virology or laboratory immunology. The goal of these experiences is for the fellow to appreciate the approach to the specific conditions that relate to PIID within these subspecialties. This interdisciplinary interaction can occur in the form of a clinical rotation in one discipline for up to 6 months, or 2 disciplines of 3 months each, or 2 disciplines of 2 and 4 months respectively, or 3 disciplines of 2 months each, subject to approval by the Training Programme Director. Acquisition of clinical experience should

be under the direct supervision of attending clinicians or trainers in the respective disciplines who participate fully in the educational goals of the rotation.

D) Didactic conferences

Conferences will be held on a regular basis with attendance required of all fellows and trainers. At a minimum there should be at least one monthly clinical case conference and one bimonthly literature review conference (journal club). Basic science or clinical research conference may be held quarterly. It is encouraged that the content of these conferences will include members from other disciplines as outlined in section C as well as radiologists and pathologists who have specific interests in the field of PIID. Fellows will be required to attend a minimum of 75% of each of the conferences.

E) Research experience

An active research component must be included within the fellowship training program. A meaningful research experience must be provided with appropriate protected time for each fellow to achieve a level of competency to initiate independent research project. Exposure to research programmes should be initiated during the first 3-6 months in the fellowship training to allow the fellow adequate insight into the areas of potential research in preparation for the ultimate selection of a trainer to serve as research mentor for the remainder of the fellowship training program. It is expected that each fellow will be able to complete a research project during the three years fellowship which is ready for submission for peer review in publication format. The immediate goal of the research experience is for the fellow to learn sound methodology in designing and performing research studies and the correct interpretation and report of research data. During this phase of training the fellow will work under close guidance of the research mentor.

F) Continuing medical education and participation in professional societies

In addition to participating in the organized didactic conferences established within the fellowship program it is also strongly encouraged that all fellows become members of the HKSPIID as well as any local society on infectious disease and immunology. Participation in the continuing medical education (CME) activities of these professional organizations will help foster the standards of professionalism and augment the process of life-long learning. It is envisaged that the CME activities of these professional societies will form the basis of the continuing professional development of the fellows.

G) Development of teaching skills

The programme must provide a nurturing environment and ample opportunity to foster activities of teaching. This includes the education of not only medical students,

physicians and other allied health personnel, but also the education of the patients and their families. Development of these competences requires the fellow to receive instruction and feedback in counselling and communication techniques. This latter training must include cultural, social, behavioural and economic issues such as confidentiality of information and indications for life support systems. Delivering health education to professionals and the public at large will also be encouraged.

H) Case reports / Case write-ups / Dissertations

Details of at least 6 interesting or complicated cases have to be presented. The cases reported need not be confined to the period of higher and subspecialty training. The description and discussion of each case should add up to around 1000 words (excluding the appended references). A word count should be inserted at the end of each case. They should reflect a comprehensive exposure in the field of immunology and infectious diseases. A total of at least 3 immunology and 3 infectious disease case reports have to be presented for final assessment. Examples of reportable cases may include, but by no means restricted to those listed in the Appendix. Alternatively, an essay type of 5,000-word dissertation on one pre-approved topic or case cohort or a research project that is published as a full paper in a peer-reviewed scientific journal can serve the same purpose.

d. Requirements of an accredited training network (general facilities, clinical and academic activities, caseloads, programme director, trainers)

Composition of a training network

Usually a training centre comprises a single physical unit. However, for PIID there is a great advantage to have two or more units collaborate to form a training network that provides a better training opportunity than when each of them stands alone.

Requirements for a paediatric Immunology and infectious diseases training network

A paediatric immunology and infectious diseases training network must:

a) Provide an integrated service for the referral and transfer of patients with complex infectious diseases and communicable diseases, in close collaboration with other paediatricians and disciplines
b) Have an adequate clinical workload with a full range of infectious diseases with at least 250 new cases per year and an infectious disease clinic operating at least on a weekly basis
c) Provide an integrated service for the referral and transfer of patients with complex immunological disorders, in close collaboration with other paediatricians and disciplines within the network, and including a

full range assessment techniques for allergy, autoimmunity, and immunodeficiency

d) Have an adequate clinical workload with a full range of immunological disorders with at least 250 new cases per year and an immunology clinic operating at least on a weekly basis

e) Centres with facilities to provide haematopoietic stem cell transplant for major primary immunodeficiencies (eg SCID, WAS) will provide rotation for all trainees to go through such core module

f) Have a close working relationship with medical genetics centre and clinical genetics consultants and supporting staff

g) Able to refer or perform prenatal diagnosis and genetic counselling in collaboration with geneticists and obstetricians, for well known Medelian genetic disorder resulting in immunodeficiencies (eg. WAS, CGD, SCID), autoinflammtory disorder (eg, CINCA) and immunodysregulation (eg. IPEX).

h) Able to perform various in vivo and in vitro allergen tests

i) Have a close partnership with in-house microbiologists, infection control team and supporting staff, with regular scheduled rounds or meetings with microbiologists

j) Have a close partnership with virologists and supporting staff

k) Have a close partnership with immunologists and supporting staff

l) Have an in-house neonatal and paediatric intensive care unit with consultants and supporting staff

m) Have capability and facility for providing intensive care to critically ill children requiring airborne isolation

n) Have an in-house haemtology and oncology unit with consultants and supporting staff

o) Have established surgical specialties with consultants and supporting staff

p) Have a microbiology laboratory capable of providing rapid diagnostic tests (antigen tests, immunofluorescence, polymerase chain reaction) and identification of multi-drug resistance for microorganisms, in addition to a 24-hour service for CSF examination, Gram smear examination, and peripheral blood smear examination for malarial parasites

q) Have radiology facilities to perform US, CT, MRI, and radioisotope scans, with a 24-hour service for urgent radiological investigations and a radiologist on emergency call

r) Have conducted and published substantial research related to the subspecialty

s) Have adequate library, laboratory and other facilities to support subspecialty work, training and research, over and above that required for the recognition of FHKAM(Paed) and higher training posts

t) Have established close collaboration with other paediatricians in the clinical network, including major roles in continuing postgraduate education, training, research and auditing services.

Standards for the accreditation of Paediatric Immunology and Infectious Diseases training network

Workload

An annual minimum of

1. Case load per year	>3000 acute hospital admissions and in-patient consultations >250 out-patient attendances related to infectious diseases >150 out-patient attendances related to immunology		
2. Case profile – Infectious Disease	* Highly complex	10	%
	* Complex	10	%
	* Intermediate	30	%
	* Simple	50	%
3. Case profile – Immunology	* Highly complex	10	%
	* Complex	20	%
	* Intermediate	30	%
	* Simple	40	%

*Highly complex – requiring advanced knowledge and considerable experience for optimal management, often rare or uncommon conditions demanding sophisticated diagnostic techniques, complicated treatment regimen and multidisciplinary team approach

eg. Primary immunodeficiency syndromes, HIV / AIDS, bone marrow transplant, infections in stem cell transplant or solid organ transplant recipients, graft-versus-host disease, lymphoproliferative disorders

*Complex – requiring special diagnostic tests and careful therapeutic monitoring, or newly identified conditions with diagnosis and treatment under development

eg. multi-drug resistant bacterial infections, multi-drug resistant tuberculosis, infective endocarditis, infections in immunocompromised hosts excluding transplant recipients, SARS, highly pathogenic avian influenza, systemic lupus erythematosus, mixed connective tissue disorders, allergen desensitization

* Each network is expected to handle at least 20-40 complex and highly complex PIID cases a year

*Intermediate – >60 cases per year of serious or life-threatening systemic or organ-specific disorders, or conditions requiring extensive diagnostic evaluation

eg. tuberculosis, fever of unknown origin, periodic fever syndromes, meningitis, meningoencephalitis, sepsis, congenital infections, empyema, shunt infections, infections due to antibiotic resistant organisms, EV 71 infection, Kawasaki disease, organ-specific autoimmunity, anaphylaxis and anaphylactoid reactions, vaccine reactions, food and drug allergy, Stevens Johnson syndrome

*Simple – >200 cases per year of common conditions that are generally managed at secondary level if hospitalization is required, and diagnosis and treatment are straight forward

eg. common respiratory infections, gastroenteritis, urinary tract infections, common childhood exanthems, allergic rhinitis, atopic dermatitis

Trainers and Training Programme Director

a) A trainer must be FHKAM(Paed) and HKCPaed accredited Paediatric Immunology and Infectious Diseases subspecialist or equivalent, and have at least 3-years of post-subspecialty experience, and should be working as a full-time staff in the training network. The requirement of trainers to have 3 years post-Subspecialty Fellowship experience will be exempted in the first 3 years of establishment of the Subspecialty.

b) There must be at least 1 trainer per training centre and at least 2 trainers to oversee a trainee within a programme or the training network.

c) One of the trainers must be designated by the Training Programme Director to co-ordinate the training programme, accepts its main responsibility for supervision of the trainee under his charge and be actively involved in it.

d) There is only one training programme to cover the training network. The Training Programme Director should have at least 10 years of post-subspecialty experience in Paediatric Immunology and Infectious Diseases and is working as a full-time staff in the training network.

Facilities

Each centre should have:

a) At least 10 well equipped negative pressure isolation rooms with at least 2 capable of delivering intensive care for critically ill children requiring airborne isolation
b) Adequate supportive resources including a medical library, internet access, information technology and statistical supports
c) A reliable electronic medical record system

Each centre should have the supportive services considered as mandatory to the programme:

1) Coordination with other relevant subspecialties
   a) PICU/NICU
   b) Medical subspecialties
   c) Surgical subspecialties
   d) Orthopaedic subspecialties
   e) Oncology

2) Special investigatory support
   a) Haematology
   b) Chemical pathology
   c) Histopathology
   d) Microbiology
   e) Radiology: US, CT, MRI, radioisotope scan

3) Special therapeutic support
   a) Interventional radiology
   b) Chemotherapy,

4) Other ancillary support
   Pharmacy, Dietetics, Clinical Psychologists, Medical Social Workers

Activities

Each centre will be accredited for training in Immunology and/or Infectious Diseases for a specified maximum period.

Each centre should have:

a) Special clinical activities such as ground rounds, joint meetings with related specialists or subspecialists, and laboratory or research meetings related to the subspecialty
b) Annual statistics including workload (discharge diagnoses and procedures), complications, morbidity and mortality data related to the subspecialty
c) Quality assurance activities / morbidity and mortality meetings
d) Regular review and update of clinical management guidelines
e) A coordinated education programme at subspecialty level
f) Research activities related to the subspecialty

Inspection of training centre

The standard of training centres and programmes will be reviewed:

a) Every 5 years, or
b) When the Training Programme Director changes, and
c) From time to time when considered necessary

PAEDIATRIC IMMUNOLOGY AND INFECTIOUS DISEASES TRAINEE

Eligibility

Trainees should have completed basic training, passed intermediate examination and in the third year of higher training.

Application

a) The training centre will advertise for prospective trainees to apply for a training position in Paediatric Immunology and Infectious Diseases Training Programme which leads to certification as a subspecialist in Paediatric Immunology and Infectious Diseases
b) Prospective trainees will apply to the training centre for the training post
c) Applicants will be asked to forward a curriculum vitae and the names of two referees
d) The training centre will organize the selection exercise
e) Applicants will be assessed against the following criteria:
    - Previous experience in the field of Paediatric Immunology and Infectious Diseases
    - Previous experience in the field of advanced paediatric skills and techniques
    - Previous CME activities related to Paediatric Immunology and Infectious Diseases
    - Research experience
    - Teaching experience
    - Referee reports
    - The results of selection will be submitted to the Paediatric Immunology and Infectious Diseases Subspecialty Board for approval before commencement of training.

Registration

Following the confirmation of acceptance to the subspecialty training programme. The trainee must register with the HKCPaed Subspecialty Board before commencement of training.

Prospective approval of training

a) Every year, application to continue Paediatric Immunology and Infectious Diseases Training has to be approved by the Paediatric Immunology and Infectious Diseases Subspeciality Board before training can proceed.
b) Approval for continuation of training should be based on satisfactory logging of experience and the trainer's recommendation.

Logging of experience

i. The trainee has to keep a logbook as required by the Board. The trainee is required to log his or her clinical activities, teaching experience, quality assurance activities, research activities, and attendance to workshops, conferences, symposia, and lectures and items as stipulated in details in the logbook. The logbook would be checked on the fulfillment of training requirements.

ii. The minimum amount of work expected for each trainee on average over the period of training includes:

a. 500 new and old out-patient consultations in that subspecialty during the whole period of subspecialty training

b. At least 1 subspecialty clinic per week

c. 200 simple cases being managed independently (various common childhood infections, exanthems, atopy, etc,)
d. 100 cases of moderate complexity managed either independently or under supervision on various immunological disorders (multiple atopy manifestations, suspected immunodeficiencies, autoimmunity, inflammatory conditions, GVHD etc) and infectious diseases and their complications (severe sepsis, unusual site of infections, pyrexia of unknown origin, neutropenic fever, infections in immunocompromized host, communicable disease outbreaks, etc.)
e. 10 highly complex cases managed in a team approach (e.g. stem cell transplant for major immunodeficiencies, uncontrolled sepsis, investigation of nosocomial outbreaks, disseminated fungal infections in immunocompromized hosts, initiating / building up and maintaining allergen specific immunotherapy, etc.)
f. 50 immunology and infectious disease consultations to other disciplines executed either independently or under supervision
g. 200 cases of interpreting various microbiological tests including rapid diagnostic tests, cultures, sensitivity tests, MIC, serology, antibiotic level monitoring, etc.
h. 50 cases of interpreting various immunological tests (e.g. DHR, NBT, lymphocyte subsets, lymphocyte proliferation, Ig pattern, functional antibodies, autoimmune markers, basophil activation test, tryptase, CRP, etc.)
i. 50 cases of performing or interpreting allergy tests

Programme of training

3 years (incorporating a cumulative of 1 year of training in PIID during the 3 years of higher training in general paediatrics plus 2 years of subspecialty training afterwards)

The training programme would be either 3 years full clinical activities, **or**

A minimum of 30 months of full clinical activities plus 6 months of research related to paediatric immunology and infectious diseases

Obtaining the qualification of a postgraduate diploma or degree (e.g. MSc, MPhil, PhD or MD) related to Immunology and/or Infectious Diseases may also be recognized as completion of training for up to a maximum of 6 months subject to approval by the Training Programme Director

The full time trainee should have more than 50% involvement in the subspecialty during normal working hours throughout their training period.

The research component should be planned soon after commencement of the programme and appropriately timetabled and mentored.

Trainees will be granted a maximum 84 days for sick leave, maternity or other special leave (excluding standard entitled vacation leave and study leave) during the whole period of training; if the period exceeds 84 days but less than 104 days, an extension of 3 months of training is required; if the period exceeds 104 days, the subsequent action will be determined by the Board.

Trainee to trainer ratio

A trainee to trainer ratio of no more than 2:1 within each training centre.

Assessment

In order for the training programme to achieve its goals and objectives, it is essential to establish an evaluation process incorporating interim and summative assessment of the fellows, and a reciprocal evaluation by fellows of the programme itself and the trainers.

Interim Assessment of the Fellows

Interim evaluation should occur at the completion of any substantive interaction with a specific trainer or specific rotation. For each clinical rotation, an assessment form will be completed by the supervising trainer. The assessment form utilized is one distributed and recommended by the Hong Kong College of Paediatricians. All trainers must complete the form prior to the completion of the rotation and review their impressions directly with the fellow. All completed assessment forms are returned to the Training Programme Director for review and placed in the fellow's permanent training record. These assessment forms are completed every 2-6 months depending on the duration of the rotation. Completed assessment forms submitted to the Training Programme Director are immediately reviewed upon their receipt. Any forms that contain a rating less than satisfactory in any category will require an immediate meeting between the fellow and the Training Programme Director to identify causes for the poor performance and suggest means for improving the deficiency. All fellows will be required to keep a case and procedure log book, identifying the patients they have managed and the procedures they have performed, including information such as date, diagnosis, treatment, outcome, complication, and name of supervising clinician. A copy of this log will be provided to the Training Programme Director 6-monthly for placement in the fellow's permanent training record. At least 3-monthly, all fellows will confer individually with the Training Programme Director to review all of their performance. This meeting is to provide feedback to the fellow and to identify areas for enhancement.

Summative Assessment of the Fellows

The overall performance of each fellow is reviewed annually by the Subspecialty Board designated Trainee Monitoring Committee comprising the Training Programme Director and 2 subspecialty board members through assessment of the portfolio and a structured interview. This committee is asked to monitor the performance and assess the level of competence of each fellow through a detailed and structured interview with specific objectives to attain in different domains. The fellow needs to present and discuss the merits of the portfolio based on his/her training in the past year. The committee's assessment is written and recorded in the programme files for future reference. Any adverse judgements regarding the fellow's performance or competence should first be directed to the Training Programme Director. If the fellow feels that the annual review is not to his / her satisfaction, then the grievance can be addressed by an established appeal mechanism directed by the College.

Evaluation of the Programme and its trainers

All fellows are required to complete and return a programme and trainers evaluation form once every year. Evaluation forms are collected in a fashion to assure the anonymity of the fellow. Fellows are encouraged to maintain a high level of communication with the Training Programme Director and trainers. Annual evaluation meetings to be attended by all trainees and subspecialty board members will be established. These meetings can be used to disseminate training information and gather timely feedbacks. The feedbacks received during informal and formal meetings, and the annual evaluation forms will be used to suggest and assist in programmatic changes.

Final Exit Assessment

The final Exit Assessment normally takes place in June and/or December each year. The trainee is to submit a collection of case/case series reports (appendix) or a 5,000-word dissertation or a published research project and attend a viva examination conducted by an Assessment Panel. The Assessment Panel comprises of either 3 Hong Kong examiners (NOT coming from the primary training centre and declare conflict of interests) or 2 Hong Kong examiners and 1 external examiner who is usually a Programme/Training Director in paediatric infectious disease or paediatric immunology from another region, or an overseas expert of renown in paediatric infectious disease or paediatric immunology. College Subspecialty Board representative is welcome to sit in to observe the standard of examination or report fault to the Subspecialty Board (without the right to score candidate or veto). Trainees who are successful at the Exit Assessment will be invited to apply for College Subspecialty Fellowship.

The examinee and the College Subspecialty Board will be informed at least 4 weeks prior. There will be a scoring system to assess examinee‘s core competency and pre-defined minimal standard. A viva of at least 30 minutes will focus mainly on clinical competency which contributes 40% of final marks. 6 Case write- ups or a 5000-word dissertation or a published research project contributes 35 % of final marks. Supervisor reports contribute

25% of final marks. The candidate will still fail if he or she could not produce case write- ups or dissertations to the satisfaction of the Assessment Panel despite scoring a total mark of more than 55 (pass level) from the other 2 domains.

If the candidate fails to pass the Exit Assessment, the Assessment Panel will recommend subsequent action for consideration by the Paedaitric Immunology and Infectious Diseases Subspecialty Board and the Subspecialty Board of the Hong Kong College of Paediatricians.

Admission of Paediatric Immunology and Infectious Diseases Subspecialist

A trainee who has completed the training and passed the exit assessment satisfactorily may apply to be a Paediatric Immunology and Infectious Diseases Subsepcialist.

PIID CME/CPD Programme and Audit

1. The Continuing Medical Education (CME) / Continuing Professional Development (CPD) cycle is 3 years.
2. CME/CPD activities related to Paediatric Immunology and Infectious Diseases:
   Research
   Publications made to immunology and infectious diseases subspecialty journals shall be eligible in obtaining active CME at the discretion of College's CME subcommittee
   Teaching
   Teaching activities to post-graduates on the relevant field shall be eligible in obtaining active CME at the discretion of College's CME subcommittee
   Attending conferences related to Paediatric Immunology and Infectious Diseases
   A minimum of 90 CME/CPD points (at least 45 points on Paediatric Immunology and Infectious Diseases) is required in a 3-year audit cycle. The method of calculating CME/CPD is similar to the current CME/CPD system of general paediatrics. The College reserves the right to accept or reject the subspecialty CME/CPD points claimed.
3. Audit activities of trainees**:**
   (a) A statistical summary (representative month's work schedule and sessions) related to Paediatric Immunology and Infectious Diseases of the patients managed over the past 3 years.
   (b) Logging of cases and procedures related to Paediatric Immunology and Infectious Diseases in 12 months within the 3 years will be audited. Related cases and procedures include but not limited to the following:
   Suggested list of procedures for infectious diseases: obtaining pernasal swab in infants with suspected pertussis, obtaining conjunctival scrapings in neonates with suspected chlamydial conjunctivitis, obtaining specimen from skin vesicle for immunofluorescence and culture in children with suspected herpes simplex or varicella zoster virus infection, administering tuberculin skin test for investigation of tuberculosis or contact tracing, diagnostic and therapeutic aspiration of suppurative BCG lymphadenitis, lumbar puncture and microscopy of CSF specimen in the evaluation of CNS infection, thoracentesis for diagnosis and treatment of pleural effusion, administration of fibrinolytic agent to improve drainage of pleural effusion, pleural biopsy for diagnosis of pleural tuberculosis.

Suggested list of procedures for immunology: coordinating, administering and monitoring IVIG replacement or subcutaneous IG replacement, assisting intra-articular injection of steroids, administering various immunological products including vaccinations, prophylactic agents (eg VZIG,) and biologics, performing bone marrow examination for indicated immunological indications, assisting in stem cell harvest and stem cell infusions, coordinating transplant proctocol, supervising food and drug challenge procedures, performing allergen skin testing, administering allergen immunotherapy, performing skin biopsy for immunological related skin manifestations, obtaining consents and specimens for various genetic and immunology function tests, triage the use of various level of isolation procedures and facilities for immunocompromized hosts.

Appendix

Programme for paediatric immunology and infectious diseases training

IMMUNOLOGY (requires a rotation of 6 months to a centre providing service for clinical immunology and bone marrow transplantation, with the emphasis of training objectives as stated)

Primary immunodeficiency -

- Molecular and genetic basis
- Clinical syndromes
- Natural history
- Management (e.g. immunoglobulin replacement and bone marrow transplant)

Secondary immunodeficiency (e.g. oncology / ICU / transplant recipients)

Infections in the immunocompromised child

Development of immunity – innate and adaptive / specific

Host defense mechanisms – age-related infections

Immunisation – mechanism of action, contraindications, precautions and vaccine-associated adverse events

Autoimmunity

Laboratory diagnosis of immunological disorders

Should have Allergy exposure (preferably in an allergy tertiary service with the emphasis of training objectives as stated)

Atopy - genetic / environmental factors in development

Mechanics of allergic sensitivities and tolerance

Urticaria / angioedema

Anaphylaxis

Food allergy

Drug allergy

Skin prick testing, RAST

Challenges

Immune modulation

INFECTIOUS DISEASE (requires a rotation of 6 months to Infectious Disease Centre of Princess Margaret Hospital for training in communicable diseases, with the emphasis of training objectives as stated)

Pathogenesis of infection and infectious injury – bacterial / viral / fungal / protozoal / helminthic

Approach to fever and fever management

Periodic fever, fever of unknown origin, fever without localizing signs

Exanthematous infections

Congenital infections

Perinatal infections

Neonatal bacterial and fungal sepsis

Ocular and periorbital infections

ENT infections

Suppurative and non-suppurative lymphadenitis (including BCG and mycobacterial lymphadenitis)

Pneumonia – community-acquired, nosocomial, ventilator-associated, atypical

Empyema thoracis and lung abscess

CNS infections

Skin and soft tisuue infections (including necrotizing fasciitis)

Musculoskeletal infections

Surgical and orthopaedic infections

Device-associated infections (e.g. catheter-related infection, CSF shunt infection, prosthetic infection)

Pericarditis, myocarditis, infective endocarditis

Acute and chronic hepatitis

Enteric infections including typhoid and paratyphoid fever

Genitourinary and sexually-transmitted infections

Mycobacterial infections – tuberculous and non-tuberculous, focal and disseminated

HIV/AIDS

Toxin-mediated diseases (e.g. scarlet fever, staphylococcal and streptococcal toxic shock syndrome)

Systemic inflammatory response syndrome, sepsis and septic shock

Travel-related and imported infections including malaria and dengue fever

Notifiable infectious diseases of local importance not listed above

Anti-infectives - pharmacokinetics, pharmacodynamics, therapeutic and prophylactic use and abuse, resistance mechanisms, drug interactions, adverse effects and toxicity, therapeutic drug monitoring, antibiotic stewardship programme, hospital antibiotic policy

Use of anti-inflammatory and immunomodulating agents in infectious diseases

Overseas training for 6 months in a tertiary referral centre. Prior approval of a recognized programme by Training Programme Director is required.

Elective module(s) of related field(s) for 6 months subject to prior approval by Training Programme Director (each module of 2-6 months duration in 1-3 rotations).

Elective modules of high priority:

Infectious Disease Epidemiology (rotation of 3-4 months to gain public health experience in the Surveillance and Epidemiology Branch +/- Infection Control Branch of the Centre for Health Protection with the emphasis of training objectives as stated)

Burden of childhood infections in HK, China and worldwide

Surveillance methods

Notification mechanisms

Epidemiologic intelligence

Field epidemiology

Outbreak control

Infection control in the community

Interaction with the media and public

Vaccination programme management

Port health and travel clinic

Statutory requirement of notification

International Health Regulations

Public health education

Social and ethical issues in the prevention and control of infectious diseases

Microbiology (rotation of 3-4 months to a microbiology service or a virology laboratory with the emphasis of training objectives as stated)

Classification of microbes

Sample collection and specimen handling

Microbiological characteristics (bacteria, viruses, fungi, protozoa, helminths) – methods of identification

Virulence factors

Antimicrobial resistance

Non-culture diagnostic tests – antigen tests, serology, PCR, in situ hybridization, immunohistochemistry

Infection control in hospital – multi-drug resistant organisms, infectious waste disposal, occupational hazards, employee health, immunization of health care workers

Immunopathology laboratory (rotation of 3-4 months to a clinical immunology service or a HLA-tissue typing laboratory or a research immunology lab or immunogenetics lab with the emphasis of training objectives as stated)

Sample collection and specimen handing of various tests

Understanding of various functional assay of humoral and cellular immunity

Understanding of autoantibodies measurements

Understanding of RAST measurements and their interpretations

Understanding the molecular aspects of immunogenetics

Paediatric rheumatology (rotation of 3-4 months to a rheumatology tertiary service with the emphasis of training objectives as stated)

Management of SLE

Management of JIA

Recognize various vasculitides and uncommon rheumatologic conditions

Use of various DMARDS

Use of intra-articular steroids

Use of biologics

Elective modules of related fields (not more than 3 months each subject to prior approval by Training Programme Director)

(1)adult infectious disease, immunology or transplantation (2) HIV/AIDS medicine (3) critical care (4) haematology / oncology (5) paediatric nephrology including renal transplantation (6) tuberculosis and respiratory medicine (7) sexually transmitted disease, venereology or genitourinary medicine (8) dermatology

Case Reports / Write-ups

Examples of reportable cases may include, but by no means be restricted to the followings:

Immunology:

1. Wiscott-Aldrich Syndrome (WAS)
2. Perianal abscess / Chronic granulomatous disease (CGD)
3. Mycobacterium infection in CGD
4. Disseminated TB / interferon deficiency
5. BCGosis / Severe combined immunodeficiency (SCID)
6. Common variable immunodeficiency / lymphoma
7. X-linked agammaglobulinaemia (XLA) / pneumococcal meningitis
8. XLA / bronchiectasis / recurrent otitis media / recurrent sinopulmonary infection
9. EBV/ haemophagocytic lymphohistiocytosis (HLH) / X-lined lymphoproliferative disease (XLP)
10. Chronic urticaria: CINCA
11. Recurrent herpes simplex: IL-12 deficiency
12. Recalcitrant eczema / abscesss/ hyper-IgE
13. Pneumatocoele / Hyper-IgE
14. Recurrent respiratory/gut infection / Hyper-IgM
15. APECED
16. Immunodysregulation, polyendocrinopathy, enteropathy, X linked IPEX
17. GVHD / nephritis
18. PID / cord blood transplant
19. Di George syndrome / transplant / white lung at engraftment
20. WAS associated with Takayasu disease / other autoimmunity
21. WAS / post-transplant autoimmunity
22. JIA / autotransplant / full remission
23. LAD / mycobacterial colonic stricture
24. AT / bronchiectasis / malignancy / death
25. HIES / STAT3 mutation/ horrific abscesses / cause of death
26. IgG subclass deficiency / asthma / eczema / controversial association
27. CVID / autoimmune hepatitis
28. IDDM / hypothyroidism / mycobacterial infection / candida infection / cause
29. CGD / neonatal aspergillosis and mycobacterial infections
30. CGD / *Chromobacterium violaceum* infection / death
31. CGD / disseminated TB / persistent salmonellosis
32. Agammaglobulinaemia / suspected SARS / death
33. Genetic counselling of asymptomatic carrier (ethical consideration)
34. Chronic benign neutropenia
35. Partial albinism and neutropenia
36. SLE / Kikuchi lymphadenopathy
37. Kikuchi disease / aplastic anaemia / SLE
38. SLE / lymphoma
39. SLE / pericardial effusion / tamponade
40. SLE / Crohns' disease
41. SLE / neuropsychiatric lupus
42. SLE / miliary TB

43. SLE / steroid-induced avascular necrosis (AVN) of hip
44. SLE / thrombotic thrombocytopenia purpura (TTP)
45. Post-transplant lymphoproliferative disease (PTLD) / EBV
46. JIA / macrophage activation syndrome (MAS) / CMV
47. JIA / leukemia / bone pain
48. JIA / septic arthritis
49. Atypical mycobacterial monoarthritis
50. Joint pain / slipped femoral epiphysis / patient on GH treatment
51. Suspected arthritis / bone tumour
52. PUO / systemic onset JIA
53. Refractory Kawasaki Disease / Use of steroid
54. Kawasaki disease / reactive arthritis
55. Atypical Kawasaki Disease
56. Acute rheumatic fever
57. HSP / abdominal pain / gastrointestinal bleeding
58. PAN / gut perforation
59. DRESS
60. Bechet syndrome / vasculitis
61. Systemic sclerosis / dermatomyositis
62. Polymyositis
63. Autoimmune hepatitis
64. Uveitis / biologic treatment
65. JIA / biologic treatment
66. Back pain / schwannoma of spine
67. Antithyroid drug / acquired SLE / nephropathy
68. Chronic relapsing osteomyelitis CROM
69. Fibromyalgia / chronic fatigue syndrome / chronic demyelinating rediculomyelitis
70. Caffey's disease
71. VAS-HLH
72. SLE / refractory thrombocytopenia / anti-CD 20 / splenectomy
73. Autoimmune lymphoproliferative syndrome (ALPS)
74. Multiple food allergy of infancy
75. Acquired / hereditary angioedema
76. Hypereosinophilic syndrome
77. Protein-induced enteropathy
78. Peanut and tree nut anaphylaxis
79. Oral allergy syndrome
80. Contact dermatitis
81. Latex allergy
82. Paracetamol anaphylaxis
83. Perioperative anaphylaxis
84. Asprin / sinusitis / nasal polyposis
85. Chronic idiopathic urticaria
86. Atopic march
87. Eczema / psoriasis
88. Eczema herpeticum
89. Eczema / use of systemic immunosuppressives
90. Erythema multiforme
91. Takayasu vasculitis

Infectious diseases:

1. Epidemiology of specific infectious diseases
2. Clinical microbiology of specific microbes
3. Exanthematous infections
4. Measles and complications
5. EV 71 infections and complications
6. Pertussis and complications
7. Infections caused by herpes viruses (HSV, VZV, CMV, EBV, HHV-6, HHV-7)
8. Human parvovirus B19 infection
9. Group A streptococcal infections and complications
10. Atypical pneumonia
11. Opportunistic pneumonia
12. Empyema thoracis
13. Lung abscess
14. Meningitis / Encephalitis / Meningoencephalitis / ADEM
15. Brain abscess
16. Periorbital cellulitis
17. Sinusitis
18. Mastoiditis
19. Parapharyngeal / retropharyngeal infection
20. *Mycoplasma pneumoniae* infection – pulmonary and extrapulmonary
21. Tuberculosis – intrathoracic / extrathoracic / miliary
22. Nontuberculous mycobacterial infection – focal and disseminated
23. Fulminant sepsis – Gram +ve and Gram -ve
24. Toxin mediated diseases – scarlet fever and toxic shock syndromes
25. Infection-associated haemolytic uraemic syndrome
26. Life-threatening infections and infectious emergencies
27. Necrotizing fasciitis and ecthyma gangrenosum
28. Travel-related and imported infections
29. Traveler's diarrhoea
30. Parasitic infestations
31. Tropical infectious diseases
32. Malaria
33. Typhus and spotted fevers
34. Dengue infection
35. Typhoid fever
36. PUO
37. Periodic fever syndromes
38. Helicobacter pylori infection
39. Acute and chronic hepatitis
40. Infective endocarditis – treatment and prophylaxis in congenital heart diseases
41. Congenital infections and complications
42. Perinatal infections
43. Catheter-related sepsis
44. CSF shunt infection
45. Sexually transmitted diseases
46. HIV/AIDS
47. Skin, soft tissue and skeletal infections
48. Food and water-borne infections
49. Viral gastroenteritis associated encephalopathy
50. Zoonoses and pet-borne infections
51. Opportunistic infections in immunocompromised hosts
52. MDR bacterial infections
53. Infectious disease outbreaks in institutions – investigation, control and prevention

54. Systemic fungal infections
55. Novel infectious agents
56. Avian influenza
57. SARS
58. Prion disease
59. Agents of biological attack / Bioterrorism
60. Kawasaki disease
61. Infection-associated haemophagocytic lymphohistiocytosis
62. Relationships of infections to cancer and chronic inflammatory disorders
63. Chemoprophylaxis and immunoprophylaxis of specific infections
64. Immunomodulation of infectious diseases
65. Novel antimicrobial agents
66. New vaccines
67. Infection control
68. Emergency and pandemic preparedness