HAND SURGERY RESIDENCY

TRAINING REQUIREMENTS

(A) INTRODUCTION

The surgical specialty of hand surgery includes the study and prevention of diseases, disorders, and injuries of the hand and upper limb and their treatment by medical, surgical, and physical methods. It also includes competencies in microsurgery and its clinical applications including microsurgical reconstruction. The education in hand surgery must be 48 months in length.

(B) PROGRAMME OVERVIEW

The advanced specialty programme is designed to be seamless with the Surgery-in-General programme for the trainee. There will be core postings in Hand Surgery and selected elective postings to expose the trainee to the breadth and depth of the specialty. The structured programme will lead to progressive acquisition of competencies detailed below. The educational outcome is a Hand Surgeon capable of independent management of common hand and upper limb conditions, and providing a microsurgical service. This education will also form the foundation for further subspecialty training in a particular area within the specialty.

(C) ADMISSION REQUIREMENTS

Entering residents into SIG must have successfully completed an accredited ACGME-I Transitional Year residency or a MOH accredited internship.

Entry into the advanced specialty program requires successful completion of the SIG program, and passing of the MRCS examination.

(D) TRAINING SYLLABUS

1. Resources
   a. Residents must have access to outpatient facilities, clinics, and office space for education in the regular preoperative evaluation and postoperative follow-up of cases for which the resident has responsibility.
   b. Technologically-current equipment considered necessary for diagnosis and treatment must be available.
   c. To provide an adequate interdisciplinary educational experience, the institution that sponsors the hand program should also participate in a Surgery-in-General program.
   d. Resources for scholarly activity by residents must include laboratory space and equipment, computer and data analysis services, statistical consultation services, research conferences, faculty expertise and supervision, support personnel, time, and funding.
e. Clinical problems of sufficient variety and volume to afford the residents adequate experience in the diagnosis and management of adult and pediatric hand disorders must be available.

f. Each resident should be the surgeon or assist for at least 200 cases per year. Of these, there should be a good mix of cases from R3-R6 including at least 20 microsurgical cases between R4-R6.

2. Participating Sites

There must be a qualified hand surgeon appointed by and responsible to the Hand Surgery program director in each geographically separate site.

a. This individual must be responsible for the education of the residents, and supervise the educational activities of other faculty as they relate to resident education at that site.

b. This individual must have major clinical responsibilities at the participating site.

3. Regularly Scheduled Didactic Sessions

a. On average, there must be at least three hours of formal teaching activities each week.

b. An average of an hour a week of this formal teaching will be provided by a National Training Program, which will provide formal teaching for core topics.

c. The principal clinical conferences should be provided at the primary site.

d. Basic science education must be provided. These may be covered onsite, at a national level, or via compulsory external courses.

i. The basic science program must include resident education in anatomy, biomechanics, biomaterials, pathophysiology of cartilage, bone, tendon muscle, skin, blood vessels and nerves; pharmacology of commonly used drugs like analgesics (Opioids, NSAIDs), antimicrobials, and medications used in the treatment of osteoporosis (bisphosphonates and other agents); and basic genetics.

ii. Residents must have organized instruction that links the patho-physiologic processes to the diagnosis, treatment, and management of clinical disorders;

4. Supplemental conferences may also be provided at other locations.

5. Evaluation of new or experimental techniques and/or materials should be included.

6. Residents must have instruction in:

a. basic motor skills, including proper use of surgical instruments and operative techniques;

b. basic microsurgery skills, including proper use of microsurgical instruments and the use of an operating microscope; operative microsurgery including microvascular anastomosis and nerve co-aptation
c. anatomy that includes study and dissection of anatomic specimens by the residents or lectures or other formal sessions;

d. pathology that includes correlative pathology in which gross and microscopic pathology are related to clinical and roentgenographic findings;

e. biomechanics emphasizing principles, terminology, and application within hand surgery;

f. the appropriate use and interpretation of radiographic and other imaging techniques; and,

g. hand related oncology, rehabilitation of neurologic injury and disease, orthotics and prosthetics, and the ethics of medical practice

7. Clinical Experience

a. The four accredited years must include at least three years of rotations on hand services. This must be taken in the following order:

i. 12 months of Hand Surgery in R3

ii. Minimum 24 months of Hand Surgery between R4 to R6

iii. Up to 12 months between R4 to R6 may be spent in electives such as Hand Surgery (or a focus area within it), Plastic Surgery, Orthopaedics, Vascular Surgery. Other electives beyond these will be evaluated on a case-to-case basis by the RAC. Each elective area should last no longer than 6 months.

b. Residents’ clinical education must include extensive experience in preoperative evaluation and decision making, intra-operative treatment, immediate and long-term postoperative care of both inpatients and outpatients.

c. Basic motor skills must be taught during clinical activities, especially in the operating room.

d. The residents must be involved in all aspects of care of the same patient.

e. The residents’ clinical experience must include:

i. general adult hand surgery;

ii. brachial plexus and peripheral nerve surgery;

iii. general pediatric hand surgery and pediatric trauma;

iv. arthroscopic assisted surgery;

v. microsurgical reconstruction;

vi. hand rehabilitation, including amputations and post-amputation care.

f. Residents must have adequate experience in non-operative outpatient diagnosis and care for adults and children.
g. Each week residents should have at least two-half days of directly supervised outpatient clinical experience in a physician’s offices or hospital clinics with a minimum of 10 patients per session.

h. The resident should evaluate the patient before participating in surgery of that patient.

8. Resident Duty Hours in the Learning and Working Environment
   a. On-call Activities
      A new patient is defined as any patient for whom the hand surgery service or department has not previously provided care.

9. Competencies
   a. Patient Care
      Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Residents must demonstrate competence in:
      i. the preadmission care, hospital care, operative care, and follow-up care (including rehabilitation) of patients;
      ii. gathering essential and accurate information about their patients;
      iii. making informed decisions about diagnostic and therapeutic interventions based on patient information and preferences, up-to-date scientific evidence, and clinical judgment;
      iv. developing and carrying out patient management plans;
      v. using information technology to support patient care decisions and patient education;
      vi. performing all medical and invasive procedures essential for the practice of hand surgery (see below);
      vii. providing health care services aimed at preventing health problems or maintaining health;
      viii. using investigatory and analytic thinking approach to clinical situations; and,
      ix. applying the basic and clinically supportive sciences which are appropriate to hand surgery.

Residents must be able to competently perform all medical, diagnostic, and surgical procedures considered essential for the area of practice. Residents must demonstrate competence in the following:
   x. general adult hand and wrist surgery, including
1. management of fractures and dislocations, including phalangeal or metacarpal with and without internal fixation; carpus, radius, and ulna with and without internal fixation; and injuries to joints and ligaments;

2. management of upper extremity vascular disorders and insufficiencies; and,

3. upper extremity pain management.

4. fingertip injuries;

5. tenorrhaphy, including flexor tendon repair and graft, implantation of tendon spacer, extensor tendon repair, and tenolysis/tenodesis;

6. tendon transfer and tendon balancing;

7. nerve repair and reconstruction, including upper extremity peripheral nerves, nerve graft, neurolysis, neuroma management, nerve decompression and transposition;

8. bone grafts and corrective osteotomies;

9. joint and tendon sheath repairs, including release of contracture, synovectomy, arthroplasty with and without implant, arthrodesis, trigger finger release, and stiff joints that result from rheumatoid or other injury management of arthritis, including synovectomy, arthroplasty (with and without implant), arthrodesis; joint repair and reconstruction, including contracture release and management of stiff joints; tendon sheath release;

10. thumb reconstruction, including pollicization, toe-hand transfer, and thumb metacarpal lengthening;

11. fasciotomy, deep incision and drainage for infection, and wound debridement;

12. foreign body and implant removal;

13. replantation and revascularization; and,

   xi. brachial plexus and peripheral nerve surgery;

   xii. general pediatric hand surgery and pediatric trauma;

   xiii. arthroscopic assisted surgery;

   xiv. microsurgical reconstruction: encompassing wound closure, including skin grafts, tissue flaps (local, regional and distant) and free microvascular tissue transfer;

   xv. hand and upper limb rehabilitation, including amputations and post-amputation care.

b. Medical Knowledge
Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioral sciences, as well as the application of this knowledge to patient care. Residents must demonstrate knowledge in:

i. anatomy and physiology with particular emphasis on the upper limb and areas relevant to microsurgical reconstruction;

ii. pathology (gross and microscopic pathology related to clinical and roentgenographic findings);

iii. biomechanics: principles, terminology, and applications in hand surgery;

iv. the appropriate use and interpretation of radiographic and other imaging techniques;

v. principles of microvascular and reconstructive surgery

vi. musculoskeletal oncology;

vii. rehabilitation of neurologic injury and disease;

viii. orthotics and prosthetics;

ix. cartilage, bone, and tendon reparative processes;

x. bone and calcium metabolism

xi. osteonecrosis, including Kienböck’s disease;

xii. Dupuytren’s disease;

xiii. congenital deformities, including syndactyly, polydactyly, radial aplasia, and others;

xiv. thermal injuries; and,

xv. rehabilitation and therapy.

c. Practice-based Learning and Improvement

Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning. Residents are expected to develop skills and habits to be able to meet the following goals:

i. identify strengths, deficiencies, and limits in one’s knowledge and expertise;

ii. set learning and improvement goals;

iii. identify and perform appropriate learning activities;

iv. systematically analyze practice using quality improvement methods, and implement changes with the goal of practice improvement;

v. incorporate formative evaluation feedback into daily practice;
vi. locate, appraise, and assimilate evidence from scientific studies related to their patients’ health problems;

vii. use information technology to optimize learning; and,

viii. participate in the education of patients, families, students, residents and other health professionals.

d. Interpersonal and Communication Skills

Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and collaboration with patients, their families, and health professionals. Residents are expected to:

i. communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds;

ii. communicate effectively with physicians, other health professionals, and health related agencies;

iii. work effectively as a member or leader of a health care team or other professional groups;

iv. act in a consultative role to other physicians and health professionals; and,

v. maintain comprehensive, timely, and legible medical records.

e. Professionalism

Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles. Residents are expected to demonstrate:

i. compassion, integrity, and respect for others;

ii. responsiveness to patient needs that supersedes self-interest;

iii. respect for patient privacy and autonomy;

iv. accountability to patients, society and the profession; and,

v. sensitivity and responsiveness to a diverse patient population, including but not limited to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation.

f. Systems-based Practice

Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care. Residents are expected to:

i. work effectively in various health care delivery settings and systems relevant to their clinical specialty;
ii. coordinate patient care within the health care system relevant to their clinical specialty;

iii. incorporate considerations of cost awareness and risk-benefit analysis in patient and/or population-based care as appropriate;

iv. advocate for quality patient care and optimal patient care systems;

v. work in inter-professional teams to enhance patient safety and improve patient care quality; and,

vi. participate in identifying system errors and implementing potential systems solutions.

g. Faculty development (residents as future educators)

Residents must demonstrate ability to, and participate in the education, supervision, and evaluation of their juniors, medical students, and other healthcare professionals. Residents are expected to:

i. Demonstrate leadership and team management skills applicable to their clinical practice

ii. Effectively provide feedback and evaluations to other clinical staff, junior staff, and medical students

iii. Be able to set teaching goals and expectations, and are able to prepare an effective presentation.

iv. Participate in group teaching, lectures, and presentations at professional meetings

10. Residents’ Scholarly Activities

Documentation of resident performance of scholarly activity should be demonstrated by manuscript preparation, lectures, teaching activities abstracts, and active performance of research or participation in clinical studies and reviews.

(E) SUPERVISION AND WORK HOURS OF RESIDENTS

I. Supervision

All residents will be supervised by a designated supervisor. The ratio of all teaching faculty to residents should be 1:1. The number of core clinical faculty to resident ratio must be no less than 1:6. 20% of resident’s time must be protected for training.

II. Work Hours

Work hours can be defined as all clinical and academic activities related to residency training. Work hours must be limited to 80 hours per week, averaged over a month, including all on-
calls. Residents must be allowed 1 day (i.e. 24 continuous hours) in 7 days free from all clinical, administrative and academic responsibilities, averaged over a month. On-call hours must not exceed 24 hours. Work hours must be reported in the designation system (e.g. New Innovations) and tracked by the Programme Director.

(G) ASSESSMENT AND FEEDBACK

I. Log of operative / clinical experience

All residents are expected to keep a log of their operative / clinical experience in the designated case log system.

II. Assessment

The supervisor's evaluation of the resident should be performed at the end of every rotation using the designated form and then submitted to the RAC for review.

III. Feedback

Residents should perform a yearly evaluation of teaching faculty and the training programme using the designated forms. These forms must be submitted to the RAC and kept absolutely confidential.

IV. Examinations

Formative Assessment
There will be a yearly National formative assessment for each trainee. The form of this will be a Multiple-choice question test, or an alternative as decided by the Hand Surgery RAC.

Exit Requirements
After the completion of residency program, residents are expected to sit for a summative exit examination before accreditation to be a specialist by the Specialist Accreditation Board (SAB).

Eligibility for the exit examination is contingent upon:
1. Written certification from the respective Program Director that the candidate has acquired the prescribed level of competency;
2. Logbook entries completed as per requirements;
3. Evidence of scholarly activity, such as:
   a. First or second author publication of a peer reviewed article of a nature, and in a journal acceptable to the RAC
   b. Successful completion of the Masters of Clinical Investigation course in NUS
   c. Portfolio of Medical Literature reviewed, the content and format of which will be determined by the RAC.
4. 80% cumulative attendance at the National Training Program.

(H) CHANGES IN TRAINEESHIP PERIOD AND WITHDRAWAL OF TRAINEESHIP

I. Changes in Training Period

Residency should be continuous. If a training programme is interrupted for any reason whatsoever, the RAC may at its discretion, require the trainee to undergo a further period of training in addition to the minimum requirements of the programme or terminate the residency altogether. All trainees are required to conform to the residency training plan as approved by the RAC.

II. Withdrawal of Traineeship

Withdrawal of traineeship requires approval from the RAC.