

# HAEMATOLOGY SENIOR RESIDENCY

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## TRAINING REQUIREMENTS

### (A) INTRODUCTION

- A. Definition and Scope of Specialty  
The medical specialty of hematology is concerned with the study of blood, the blood-forming organs, and blood diseases. Hematology includes the study of etiology, diagnosis, treatment, prognosis, and prevention of blood diseases.
- B. Duration of Training  
With effect from July 2017 Intake onwards, the duration of the Haematology training must be 42 months in length (inclusive of 2 months per year of internal medicine/geriatric medicine rotation)

### (B) PROGRAMME OVERVIEW

- 24 months (R4 – R5, ACGME-I accredited)
- 18 months (R6 – R7, JCST accredited)

### (C) TRAINING REQUIREMENTS R4 – R5

To qualify for haematology training, a resident must have the following qualifications:

For 2010-2012 in-flight medical officers:

- Pass MRCP/M.Med (Internal Medicine) and/or ABIM

For 2013 intake of internal medicine junior residents:

- Pass the local clinical exam and/or ABIM exam and complete junior residency

For progression to R5, the senior resident must pass both MRCP/M.Med (Internal Medicine) and ABIM

ACGME-I's advanced specialty requirements can be found here: <http://www.acgme-i.org/web/requirements/145InternalMedicineHematology.pdf>

### CLINICAL EXPERIENCE

1. A minimum of 12 months must be devoted to clinical experience.
2. The program must provide at least one month of clinical experience in autologous and allogeneic bone marrow transplantation.
3. Inpatient assignments should be of sufficient duration to permit continuing care of a majority of the patients throughout their hospitalization.
4. Fellows must assume continuing responsibility for acutely- and chronically-ill patients in order to observe and manage both inpatients and outpatients with a wide variety of blood and neoplastic disorders, as well as the benefits and adverse effects of therapy.
5. Fellows should participate in the care of patients undergoing:
  - a) apheresis procedures; and,

- b) bone marrow or peripheral stem cell harvest for transplantation.
- 6. Fellows should have experience with:
  - a) performance and interpretation of partial thromboplastin time, prothrombin time, platelet aggregation, and bleeding time, as well as other standard and specialized coagulation assays; and,
  - b) test of hemostasis.
- 7. Each fellow should, on average, be responsible for no more than eight-to-12 patients during each half-day ambulatory session.
- 8. Fellows are strongly suggested to have a structured continuity ambulatory clinic experience that exposes them to the breadth and depth of hematology. If provided:
  - a) This experience should average one half-day each week throughout the 24 months of accredited education.
  - b) This experience must include an appropriate distribution of patients of each gender and a diversity of ages.
  - c) Each fellow should, on average, be responsible for four-to-eight patients during each half-day session.
  - d) This experience should not be interrupted by more than one month, excluding a fellow's vacation.
- 9. Procedures and Technical Skills
  - a) Direct supervision of procedures performed by each fellow must occur until proficiency has been acquired and documented by the program director.
  - b) Faculty members must teach and supervise the fellows in the performance and interpretation of procedures, and this must be documented in each fellow's record, including indications, outcomes, diagnoses, and supervisor(s).
  - c) Fellows must participate in training using simulation.
- 10. Fellows must have experience in the role of a hematology consultant in both the inpatient and outpatient settings.

## KEY COMPETENCIES

The training programme aims to achieve the desired outcomes in the 6 key competencies of Patient Care, Medical Knowledge, Practice-based learning and Improvement, Interpersonal and Communication Skills, Professionalism and System-based practice.

### 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:

- 1. the practice of health promotion, disease prevention, diagnosis, care, and treatment of patients of each gender, from adolescence to old age, during health and all stages of illness;
- 2. providing consultations;
- 3. assessment of hematologic disorders by CT, MRI, PET scanning, and nuclear imaging techniques;
- 4. care and management of geriatric patients with hematologic disorders;
- 5. care and management of venous access devices;
- 6. care of patients with human immunodeficiency virus (HIV)-related malignancies;
- 7. correlation of clinical information with cytology, histology, and immunodiagnostic imaging techniques;

8. evaluation and management of diagnosis, pathology, staging, and management of neoplastic disorders of the:
  - a) lymphoid organs; and,
  - b) hematopoietic system.
9. indications and application of imaging techniques in patients with neoplastic and blood disorders;
10. intrathecal administration of chemotherapeutic agents;
11. management and care of indwelling access catheters;
12. management of the neutropenic and the immunocompromised patient;
13. management of pain, anxiety, and depression in patients with hematologic disorders;
14. multidisciplinary management of hematologic malignancies;
15. palliative care, including hospice and home care;
16. performance and interpretation of bone marrow aspiration and biopsy;
17. performance and interpretation of lumbar puncture and interpretation of cerebrospinal fluid;
18. performance of assessment and interpretation of complete blood count, including platelet and white cell differential, by means of automated or manual techniques, with appropriate quality control;
19. preparation staining and interpretation of blood smears, bone marrow aspirates, and touch preparations, as well as interpretation of bone marrow biopsies;
20. rehabilitation and psychosocial care of patients with hematologic disorders;
21. role and use of hematologic, infectious disease, and nutrition support;
22. tests of hemostasis and thrombosis for both congenital and acquired disorders and regulation of antithrombotic therapy;
23. treatment and diagnosis of paraneoplastic disorders;
24. treatment of patients with acquired and congenital disorders of hemostasis and thrombosis, including the biochemistry and pharmacology of coagulation factor replacement therapy and use of antithrombotic therapy;
25. use of chemotherapeutic agents and biological products through all therapeutic routes;
26. use of chemotherapeutic drugs, biologic products, and growth factors, as well as their mechanisms of action, pharmacokinetics, clinical indications, and limitations, including their effects, toxicity, and interactions; and,
27. use of multiagent chemotherapeutic protocols and combined modality therapy of hematologic malignancies.

**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 of:

1. the scientific method of problem solving and evidence-based decision making;
2. indications, contraindications, limitations, complications, techniques, and interpretation of results of those diagnostic and therapeutic procedures integral to the discipline, including the appropriate indications for and use of screening tests/procedures;
3. pathogenesis, diagnosis, and treatment of disease, including:
  - a) basic molecular and pathophysiologic mechanisms, diagnosis, and therapy of diseases of the blood, including anemias, diseases of white blood cells and stem cells; and
  - b) disorders of hemostasis and thrombosis for both congenital and acquired disorders and regulation of antithrombotic therapy.
4. genetics and developmental biology, including:
  - a) cytogenetics, and the nature of oncogenes and their products; and,
  - b) prenatal diagnosis where appropriate.
5. physiology and pathophysiology, including:
  - a) hematopoiesis;
  - b) molecular mechanisms of hematopoietic and lymphopoietic malignancies;
  - c) principles of oncogenesis; and,

- d) tumor immunology.
  - 6. clinical epidemiology and biostatistics, including clinical study and experimental protocol design, data collection, and analysis;
  - 7. basic principles of laboratory and clinical testing, quality control, quality assurance, and proficiency standards;
  - 8. immune markers, immunophenotyping, flow cytometry, cytochemical studies, and cytogenetic and DNA analysis of neoplastic disorders;
  - 9. malignant and hematologic complications of organ transplantation;
  - 10. gene therapy;
  - 11. effects of systemic disorders and drugs on the blood, blood-forming organs, and lymphatic tissues;
  - 12. transfusion medicine, including the evaluation of antibodies, blood compatibility, and the indications for and complications of blood component therapy and apheresis procedures;
  - 13. principles of, indications for, and limitations of radiation therapy in the treatment of cancer;
  - 14. indications for and complications of autologous and allogeneic bone marrow or peripheral blood stem cell transplantation;
  - 15. principles of, indications for, and complications of peripheral stem cell harvests; and,
  - 16. the mechanisms of action, pharmacokinetics, clinical indications for, and limitations of chemotherapeutic drugs, biologic products, and growth factors, including their effects, toxicity, and interactions.
- 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.
- 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.
- E. Professionalism  
Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.
- 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.
- G. Faculty Development
- I. There must be a sufficient number of physician and non-physician faculty members with documented qualifications to instruct and supervise all fellows.
  - II. All faculty members must:
    - a) devote sufficient time to the educational program to fulfill their supervisory and teaching responsibilities and demonstrate a strong interest in fellow education;
    - b) administer and maintain an educational environment conducive to educating fellows in each of the ACGME-I competency areas; and,
    - c) establish and maintain an environment of inquiry and scholarship with an active research component.
  - III. All physician faculty members must:
    - a) have current ABMS certification in the subspecialty, or possess qualifications acceptable to the ACGME-I Review Committee; and,
    - b) possess current medical licensure and appropriate medical staff appointment.
  - 4. Core Faculty Members
    - a) Core faculty members are attending physicians who dedicate, on average, 10 hours per week throughout the year to the program.

- b) Each program must have at least one core faculty member in addition to the program director.
- c) There must be a minimum of one core faculty member for every two fellows.

#### (D) TRAINING REQUIREMENTS R6 – R7

##### 1. Foundational Requirements

The R6-R7 years must be in compliance with ACGME-I's Foundational Requirements.

Foundational requirements for all other specialties can be found here: <http://www.acgme-i.org/web/requirements/SubspecialtyFoundational.pdf>

##### 2. Specialty Specific Requirements

###### ENTRY REQUIREMENTS

- Satisfactorily complete R4 – R5 ACGME-I accredited training

##### 3. Resident Competencies

	R6 – R7
1. <i>Patient Care</i>	<ul style="list-style-type: none"> <li>• Role model for gathering subtle and reliable information from patient for junior members of health care team.</li> <li>• Routinely identify subtle or unusual physical findings that may influence clinical decision making</li> <li>• Recognize disease presentations that deviate from common patterns and that require complex decision making</li> <li>• Independently manage patients with a broad spectrum of clinical disorders seen in the practice of haematology</li> <li>• Manage complex or rare medical conditions</li> <li>• Customize care in the context of the patient's preferences and overall health</li> <li>• Provide haematology consultation for patients with complex clinical problems</li> </ul>
2. <i>Medical Knowledge</i>	<ul style="list-style-type: none"> <li>• Understand the relevant pathophysiology and basic science for uncommon or complex medical conditions</li> <li>• Demonstrate sufficient knowledge of socio-behavioral sciences including but not limited to health care economics, medical ethics, and medical education</li> <li>• Manage patients with conditions that require intensive care</li> <li>• Demonstrate sufficient knowledge to evaluate complex or rare medical conditions and multiple coexistent conditions</li> <li>• Applies knowledge with attention to clinical outcome, cost-effectiveness, risk-benefit and patient preference</li> </ul>
3. <i>Practice-based Learning and Improvement</i>	<ul style="list-style-type: none"> <li>• Identify areas in fellow's own practice and local system that can be changed to improve effect of the processes and outcomes of care</li> <li>• Engage in a quality improvement intervention, together with interdisciplinary team</li> <li>• Utilizes resources to complete the process</li> <li>• Independently, appraise clinical guideline recommendations for bias and cost-benefit considerations</li> </ul>
4. <i>Interpersonal and</i>	<ul style="list-style-type: none"> <li>• Engage patients/advocates in shared decision making for difficult, ambiguous, or controversial scenarios</li> </ul>

<i>Communication Skills</i>	<ul style="list-style-type: none"> <li>• Role model effective communication skills in challenging situations</li> </ul>
<i>5. Professionalism</i>	<ul style="list-style-type: none"> <li>• Provide leadership for a team that respects patient dignity and autonomy</li> <li>• Serve as a professional role model for more junior colleagues (e.g. medical students, interns)</li> </ul>
<i>6. Systems-based Practice</i>	<ul style="list-style-type: none"> <li>• Advocates for appropriate allocation of limited health care resources.</li> <li>• Demonstrate how to manage the team by using the skills and coordinating the activities of inter-professional team members</li> </ul>

## (E) POSTING ROTATIONS

### COMPULSORY REQUIREMENTS

R4 – R5 (ACGME-I accredited years) (24 months)

- 12 months Inpatient and Outpatient Services
- 6 months Haematology Laboratory
- 2 months Blood Transfusion
- 4 months Geriatric Medicine/General Medicine

R6 – R7 (JCST accredited years) (18 months)

- Minimum 9 months and maximum 12 months Inpatient and Outpatient Services
- Minimum 3 months and maximum 6 months Haematology Laboratory
- 1 month Blood Transfusion
- 2 months Geriatric Medicine/General Medicine

Total Duration:

42 months (including 6 months of compulsory Geriatric Medicine/General Medicine posting)

## (F) LOG OF OPERATIVE / CLINICAL EXPERIENCE

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

## (G) ASSESSMENT AND EXAMINATIONS

### I. Supervisors 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.

### II. 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.

### III. Examinations

Residents should pass the following specific examination before next residency progression and upon exit.

<b>R4</b>	<b>R5</b>
<ul style="list-style-type: none"> <li>• Pass in MRCP or ABIM (for AY2017 cohort** and before) for progression from R3 to R4</li> </ul> <p>**AY2017 cohort is given an option to pass MRCP or ABIM for progression from R3 to R4. Last ABIM exam will be in 2020.</p>	<ul style="list-style-type: none"> <li>• Pass in both MRCP and ABIM for progression to R5 (applicable for AY2016 cohort and before)</li> </ul>
<ul style="list-style-type: none"> <li>• From July 2019 onwards, MRCP is required for progression from R3 to R4. Hence, R4 residents who only have ABIM are required to pass MRCP for progression to R5.</li> </ul>	

## **(H) CHANGES IN TRAINEESHIP PERIOD AND LEAVE OF ABSENCE**

### **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 resident to undergo a further period of training in addition to the minimum requirements of the programme or terminate the residency altogether. All residents are required to conform to the residency training plan as approved by the RAC and complete all the exit and training requirements within the maximum candidature.

### **II. Leave of Absence**

All residents are to comply with the prevailing MOH policy on Leave of Absence.

### **III. Overseas Postings**

Overseas attachment during Senior Residency training is not permitted with the exception of Radiation Oncology and Neurosurgery (*refer to JCST Circular 114/14*).