

Appendix E

AFC Hyperbaric Medicine Program

Objectives for the educational experiences (C3)

E.1. Goals and Objectives for the Educational Program

The overall goal of the AFC Training Program in Hyperbaric Medicine at the University of Toronto is to produce competent specialists in Hyperbaric Medicine (Clinical Hyperbaric Medicine Stream) who will provide clinical excellence and leadership by demonstrating competency in all seven CanMEDS roles as they practice Hyperbaric Medicine.

The trainee will acquire the ability to disseminate **medical knowledge** about the established and evolving biomedical, clinical, epidemiological and social-behavioral science of hyperbaric oxygen therapy as well as apply this knowledge to patient care.

Trainees will participate in a comprehensive didactic program and complete clinical rotations to ensure that they acquire all the relevant knowledge and skills.

1.1. Medical Expert

By the end of the AFC program the AFC trainee will be able to:

1. Demonstrate a working knowledge of the theoretical basis of the discipline, including its foundations in the sciences and research.
2. Recognize and be able to manage:
 - a. Physiological changes and medical disorders related to altered pressure environments
 - b. Medical and occupational utilization of hyperbaric chambers
 - c. Use of hyperbaric oxygen for approved medical conditions
 - d. Management of complications related to hyperbaric oxygen and hyperbaric exposures
 - e. Management of staff hyperbaric exposures in multi-place chamber operations
 - f. Management of medical co-morbidities in patients undergoing Hyperbaric Oxygen Therapy (HBOT)
 - g. Safety aspects of hyperbaric exposures and chambers
 - h. Safe decompression from increased ambient pressures.

1.2. Communicator

By the end of the AFC program the AFC trainee will be able to:

- a. Communicate with patients and patient's families, demonstrating an understanding of needs and perception of patients with acute and chronic conditions requiring hyperbaric oxygen therapy.
- b. Provide elective and emergency consultations, on-call services and advice to emergency departments and health professionals for patients that may require hyperbaric oxygen treatment.
- c. Effectively transfer the information by both written documentation and verbal presentation to the referring physician and other member of interdisciplinary team involved in the patient care.
- d. Provide appropriate follow-up and transition of care at end of therapy with discharge letters that are well organized, timely and legible in at least 10 patients.

1.3. Collaborator

By the end of the AFC program the AFC trainee will be able to:

- a. Work effectively with inter disciplinary teams in the:
 - Hyperbaric Unit
 - Emergency Room
 - Intensive Care Unit
 - Surgical inpatient units
 - Internal Medicine inpatient units
- b. Collaborate with referring services in order to establish a comprehensive patient management plan.

1.4. Leader

By the end of the AFC program the AFC trainee will be able to:

- a. Develop ways to maintain or increase efficiency in management of the Hyperbaric Medicine Unit, which may involve chronic anxious or critically ill patients and families.
- b. Apply standard operating procedures (SOPs) for hyperbaric treatments.
- c. Apply safety policies and risk mitigation strategies in hyperbaric chamber operations and use of equipment.
- d. Analyze the quality of care for individual patients.
- e. Identify and analyze system-level safety or quality concerns in healthcare delivery relevant to Hyperbaric Medicine
- f. Educate others about Hyperbaric Medicine.

1.5. Scholar

By the end of the AFC program the AFC trainee will be able to:

- a. Participate and contribute to the monthly Mortality& Morbidity Rounds and The Hyperbaric Medicine Unit Educational Days (once in 4 months)
- b. Demonstrate familiarity with the hyperbaric medicine journals and textbooks.
- c. Complete a scholarly project in Hyperbaric Medicine such as a research proposal, abstract, manuscript, a summary of the literature or an educational module.

1.6. Health Advocate

By the end of the AFC program the AFC trainee will be able to:

- a. Learn to be proactive in the preparation and anticipation of potential complications of the patient undergoing hyperbaric oxygen therapy.
- b. Advocate for resources for improved care, such as multidisciplinary approach and use new medical technologies in patients admitted for hyperbaric oxygen therapy and consultation.
- c. Recognize and mitigate the effects of the hyperbaric environment on physical and mental functioning of HBOT personnel.

1.7. Professional

By the end of the AFC program the AFC trainee will be able to:

- a. Demonstrate appropriate professional behaviors such as being punctual, reliable, and responsible.
- b. Provide medical management of the patient throughout the pre-, intra-, and post hyperbaric exposure including medical oversight of clinical hyperbaric treatments, for elective, urgent and emergency indications.
- c. Recognize personal limits and seek appropriate consultation as necessary.

- d. Show consideration in the ethical aspects of patient care.
- e. Deliver the highest quality care with compassion, honesty and integrity.

E.2. Educational Experiences

The training is expected to require a minimum of 3 – 12 months depending upon whether the components are undertaken on a full or part time basis.

E.2.a. The trainee will manage at least:

- a. 240 elective hyperbaric oxygen treatments utilizing both monoplace and multiplace hyperbaric chambers, which will include at least 10 different cases in the monoplace chamber and 10 different cases in the multiplace chamber. (Location: Hyperbaric Medicine Unit, TGH)
- b. Five different emergency treatment patients utilizing both monoplace and multiplace chambers. (Location: Hyperbaric Medicine Unit, TGH)
- c. Twenty consultations including elective, urgent, emergency and critically patient (Location: Hyperbaric Medicine Unit, TGH)
- d. Twenty follow up consultations (Location: Hyperbaric Medicine Unit, TGH)
- e. TpO2 measurements (Location: Hyperbaric Medicine Unit, TGH)
- f. Anesthesia Rotation: 5 days (Location: Department of Anesthesia, TGH)
- g. ICU rotation: 5 days (Location: CVICU, TGH)
- h. ENT rotation: 1 day elective (Location: ENT clinic, TGH)
- i. Wound Care Clinic: 5 days (Women College Hospital)
- j. Vascular lab: 1 day elective (Location: TGH)

E.2.b. CanMEDS Specific Teaching

The teaching will incorporate:

- a. Discussions of clinical cases during consultations (including wound assessment, otoscopy, physical and neurological examination); follow ups and M&M rounds;
- b. Participation in simulation sessions and didactic lectures during Educational Days;
- c. Planning, design, writing and presentation of the scholarly project.

E.2.c. Trainees without anesthesia/ICU/ emergency medicine training will have clinical experience with airway management, intravenous and arterial line placement in the operating room with one to one supervision by the faculty. **Please see the table below for learning goals, teaching and assessment methods for** Hyperbaric Medicine, Anesthesia rotation, -ICU experience, ENT experience, Wound Care Clinic and Vascular lab.

AFC in Hyperbaric Medicine Objectives of Educational Experience

Rotation	Role	Learning goal	Teaching Methods	Assessment
Hyperbaric Medicine Unit (240 elective hyperbaric oxygen treatments)	Medical Expert	<ul style="list-style-type: none"> • Perform appropriate history + physical exam. • Order appropriate ancillary tests. • Correctly diagnose condition patient was referred for. • Determine severity + urgency of treatment • Referrals to other health professionals as indicated such as: <ul style="list-style-type: none"> ○ Other specialist physicians ○ Orthotics ○ Physiotherapy ○ Home care and wound care • Description of the clinical condition being treated sufficient to guide other hyperbaric physicians and provide a baseline for later comparison. • Assess appropriateness for hyperbaric treatment according to accepted scientific guidelines. • Initiate adjuvant medical treatment to optimize patients for HBOT. • Ability to assess vision for changes in visual acuity. • Ability to perform and interpret transcutaneous oxygen measurements and Laser Doppler. 	<ul style="list-style-type: none"> • Interactive teaching • M&M Rounds • Feedback during consultations • Simulation sessions 	<ul style="list-style-type: none"> • Submit 10 consultations or case summaries for a variety of conditions including: • At least two different emergency or urgent cases with, treatment plan and progress notes. • At least one critically ill patient. • At least 3 different conditions represented.

<p>Hyperbaric Medicine Unit</p>	<p>Medical Expert</p>	<p>Prescribe appropriate initial treatment:</p> <ul style="list-style-type: none"> • Appropriate prescription of hyperbaric oxygen treatment and / or other treatments as indicated. • Appropriate determination of urgency of HBOT. • Familiarity with standardized treatment schedules and tables (depth, duration, descent and ascent rates), and potential modifications. • Recognition of circumstances when HBOT should be postponed or cancelled. 		<ul style="list-style-type: none"> • Submit 10 consultations or case summaries that demonstrate that the standards are met, including appropriate liaison to facilitate treatment for extended periods. • The consultations or case summaries must include treatment plans representing a spectrum of at least 3 different conditions and a range of patient complexity, severity and urgency.
<p>Hyperbaric Medicine Unit</p>		<ul style="list-style-type: none"> • Undertake, oversee, interpret and document clinical tests, procedures and management necessary for the care of the patient. 		<ul style="list-style-type: none"> • Submit clinical documentation for 10 cases of medical consultations, clinical notes, photographic records, demonstrating wound care, pain control, adjustments to diabetic management to coordinate with HBOT, etc. • Photography or other documentation of wound care. • Submit TCOM results from 3 cases including interpretations (or provide interpretation of 3 simulated TCOM results). • Submit Laser Doppler or other vascular assessment results from 3 cases including interpretations (or provide interpretation of 3 simulated cases) relevant to patients referred for hyperbaric consultation.

<p>Hyperbaric Medicine Unit</p>		<ul style="list-style-type: none"> • Recognize and appropriately manage potential problems and relative contra-indications for hyperbaric treatment. • Identify situations in which treatment must be cancelled, postponed, aborted or modified as a result of a patient's condition. • Provide appropriate management of the condition for which the patient was prescribed HBOT and co-morbid conditions. 		<ul style="list-style-type: none"> • Submit 10 consultations or case summaries, documenting that they can recognize and confirm indications and contraindications (at least 2 fit, 3 fit with modifications, and 2 unfit) – no more than 3 may be simulated cases.
<p>Hyperbaric Medicine Unit</p>	<p>Communicat or</p>	<ul style="list-style-type: none"> • Provide appropriate advice on emergency cases to emergency departments, other physicians and health professionals while on-call. • Recognize and provide appropriate advice on managing medical conditions that potentially may require hyperbaric oxygen treatment. 		<ul style="list-style-type: none"> • Submit records describing 3 cases where advice was provided verbally, electronically or in person on the management of emergency patients. • Submit three case summaries (range of reasons) where it has been necessary to cancel, postpone, abort or modify hyperbaric treatment due to a patient's medical condition.

<p>Hyperbaric Medicine Unit</p>	<p>Collaborator</p>	<ul style="list-style-type: none"> • Collaborate effectively with other members of the hyperbaric team. • Collaborate with other physicians and health professionals (non-hyperbaric professionals) caring for individual patients. 		<ul style="list-style-type: none"> • Multi-source feedback
<p>Hyperbaric Medicine Unit</p>	<p>Leader</p>	<ul style="list-style-type: none"> • Apply standard operating procedures (SOPs) for clinical hyperbaric treatments • Demonstrate adherence to written treatment protocols and SOPs • Documentation that illustrates understanding of the importance of standardized protocols and SOPs 	<ul style="list-style-type: none"> • Interactive teaching • Simulations sessions 	<ul style="list-style-type: none"> • Submit records of prescribing and adhering to at least two different standard treatment protocols and two SOPs

<p>Hyperbaric Medicine Unit</p>	<p>Scholar</p>	<ul style="list-style-type: none"> • Demonstrate awareness of current standards of care in clinical hyperbaric medicine • Participate in national or international hyperbaric meetings • Awareness of current research and journals 		<ul style="list-style-type: none"> • Evidence of recent (within 3 years) attendance at a national or international level hyperbaric scientific meeting • Submit critical appraisal of a recent journal article or Standard of Care document
<p>Hyperbaric Medicine Unit</p>	<p>Health Advocate</p>	<ul style="list-style-type: none"> • Learn to be proactive in the preparation and anticipation of potential complications of the patient undergoing hyperbaric oxygen therapy. • Advocate for resources for improved care, such as multidisciplinary approach and use new medical technologies in patients admitted for hyperbaric oxygen therapy and consultation. • Recognize and mitigate the effects of the hyperbaric environment on physical and mental functioning of HBOT personnel. 		<ul style="list-style-type: none"> • Present at least 2 cases at the M&M rounds • Multisource feedback

<p>Hyperbaric Medicine Unit</p>	<p>Professional</p>	<ul style="list-style-type: none"> • Demonstrate appropriate professional behaviors such as being punctual, reliable, and responsible. • Provide medical management of the patient throughout the pre-, intra-, and post hyperbaric exposure including medical oversight of clinical hyperbaric treatments, for elective, urgent and emergency indications. • Recognize personal limits and seek appropriate consultation as necessary. • Show consideration in the ethical aspects of patient care. • Deliver the highest quality care with compassion, honesty and integrity. 		<ul style="list-style-type: none"> • Multisource feedback
<p>Anesthesia (5 days)</p>	<p>Medical Expert</p>	<ul style="list-style-type: none"> • Perform airway assessment • Airway management such as bag mask ventilation, endotracheal intubation/extubation. • Arterial line and intravenous line placement • Fluid management 	<ul style="list-style-type: none"> • Hands on teaching • Interactive teaching 	<ul style="list-style-type: none"> • Submit summary of performed procedures signed by the anesthesia faculty
<p>Intensive Care Unit (two days)</p>	<p>Medical Expert</p>	<ul style="list-style-type: none"> • Perform physical and neurological examination of critically ill patient • Recognize and know how to manage: <ol style="list-style-type: none"> 1. Tension pneumothorax 2. Obstructed airway 3. Arterial gas embolism 	<ul style="list-style-type: none"> • Hands on teaching • Interactive teaching • Rounds • Case discussion 	<ul style="list-style-type: none"> • Submit summary of performed procedures signed by the anesthesia faculty

		<ol style="list-style-type: none"> 4. Decompression sickness 5. Congestive heart failure 6. Acute hypertension 7. Hypo / hyperglycemia 8. Necrotizing infection 9. Anxiety 10. Be familiar with sedation and pain management protocols 11. Prescribe inotropes and vasoactive medications 12. Chest tube / thoracentesis 13. Bladder catheterization 		
Intensive Care Unit (two days)	Professional	<ul style="list-style-type: none"> • Demonstrate appropriate professional behaviors such as being punctual, reliable, and responsible. • Recognize personal limits and seek appropriate consultation as necessary. • Show consideration in the ethical aspects of patient care. 		
ENT 1 day elective at ENT Clinic	Medical expert	<ul style="list-style-type: none"> • Ability to assess the ear to determine risk or occurrence of auditory barotrauma by otoscopy • Recognize and manage <ul style="list-style-type: none"> ○ Auditory barotrauma ○ Sinus barotrauma ○ Miringotomy ○ Cerumen removal 	<ul style="list-style-type: none"> • Hands on teaching • Interactive teaching • Rounds • Case discussion 	<ul style="list-style-type: none"> • Submit summary performed otoscopies, miringotomies
Wound Care Clinic 3 days at WCH	Medical expert	<ul style="list-style-type: none"> • Adequate assessment, debridement and appropriate management of different types of wounds • Wound photography • Multidisciplinary approach in management of complex wounds 	<ul style="list-style-type: none"> • Hands on teaching • Interactive teaching • Rounds • Case discussion 	<ul style="list-style-type: none"> • Submit clinical notes of assessment of at least one each of the following types of wounds: <ul style="list-style-type: none"> ○ Diabetic foot ulcer ○ Radiation • Submit photos of 3 wounds before and after debridement
Wound Care Clinic 3 days at WCH	Professional	<ul style="list-style-type: none"> • Demonstrate appropriate professional behaviors such as being punctual, reliable, and responsible. • Recognize personal limits and seek appropriate consultation as necessary. 		<ul style="list-style-type: none"> • Multisource feedback

		<ul style="list-style-type: none"> Show consideration in the ethical aspects of patient care. 		
Vascular lab 1 day elective	Medical expert	<ul style="list-style-type: none"> Physical examination of vascular patient Ability to interpret angiography. Indications for revascularization 	<ul style="list-style-type: none"> Hands on teaching Interactive teaching Case discussion 	<ul style="list-style-type: none"> Submit clinical notes of assessment of at least 2 vascular patients