Core Curricular Elements for Fellowship Training in International Emergency Medicine


Abstract

Objectives: The objective was to describe the common educational goals, curricular elements, and methods of evaluation used in international emergency medicine (IEM) fellowship training programs currently. IEM fellowship programs have been developed to provide formal training for emergency physicians (EPs) interested in pursuing careers in IEM. Those fellowships are variable in scope, objectives, and duration. Previously published articles have suggested a general curriculum structure for IEM fellowships.

Methods: A search of MEDLINE, EMBASE, and CINAHL databases from 1950 to June 2008 was performed, combining the terms international, emergency medicine, and fellowship. Online curricula and descriptive materials from IEM fellowships listed by the Society for Academic Emergency Medicine (SAEM) were reviewed. Knowledge and skill areas common to multiple programs were organized in discrete categories. IEM fellowship directors were contacted for input and feedback.

Results: Eight articles on IEM fellowships were identified. Two articles described a general structure for fellowship curriculum. Sixteen of 20 IEM fellowship programs had descriptive materials posted online. These information sources, plus input from seven fellowship program directors, yielded the following seven discrete knowledge and skill areas: 1) emergency medicine systems development, 2) humanitarian relief, 3) disaster management, 4) public health, 5) travel and field medicine, 6) program administration, and 7) academic skills.

Conclusions: While IEM fellowships vary with regard to objectives and structure, this article presents an overview of the current focus of IEM fellowship training curricula that could serve as a resource for IEM curriculum development at individual institutions.

Keywords: emergency medicine, international, fellowship, curriculum, public health

Over the past decades, there has been considerable interest in emergency medicine (EM) services internationally. Recent literature has documented advances in EM in a broad range of countries, and multiple nations have now begun formal EM residency programs.\(^1\)\(^-\)\(^3\)\(^1\) Given the ability to treat a wide range of clinical problems, and a familiarity with prehospital and medical emergencies, emergency physicians (EPs) are well suited to working in a variety of international settings.

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Abbreviations: ACLS = Advanced Cardiac Life Support; ATLS = Advanced Trauma Life Support; CARE = an international nongovernmental organization that uses the acronym as its full name; DFID = United Kingdom Department for International Development; ECHO = European Commission Humanitarian Aid Department; IMC = International Medical Corps; IRC = International Rescue Committee; JICA = Japan International Cooperation Agency; MSF = Médecins Sans Frontières (Doctors Without Borders); OCHA = United Nations Office for the Coordination of Humanitarian Affairs; PALS = Pediatric Advanced Life Support; USAID = United States Agency for International Development; WHO = World Health Organization; WFP = World Food Programme.
International emergency medicine (IEM) has been defined by Arnold as “...the area of emergency medicine concerned with the development of emergency medicine in other countries.” Accordingly, IEM is involved with the development of emergency medical care systems, the education and training of emergency medical care providers, and the delivery of emergency medical care in areas of need throughout the world.

To support the growing interest in IEM, national EM organizations in the United States, such as the American College of Emergency Physicians (ACEP), the American Academy of Emergency Medicine (AAEM), and the Society for Academic Emergency Medicine (SAEM), have developed sections, committees, and interest groups in international health.

As of October 2008, 20 academic institutions had IEM fellowships listed with SAEM. These programs are presented in Table 1. IEM fellowships are not currently accredited by the Accreditation Council for Graduate Medical Education (ACGME) and most positions are funded predominantly through clinical revenue generated by the fellows from their clinical practice in the emergency department (ED). Because of this funding model, eligibility is restricted to graduates of U.S. or Canadian EM residency programs or individuals who are otherwise board-eligible or board-certified in EM. In addition to the IEM fellowship programs described above, there are a growing number of training programs for medical graduates from outside the United States and Canada who wish to gain expertise and exposure to the North American system of EM. These positions are typically funded by the government of the participant’s home country, another sponsoring agency or institution, or separate grant funding.

### Table 1: IEM Fellowship Programs

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<th>Institution</th>
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<tr>
<td>Alameda County Medical Center–Highland Hospital</td>
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<td>Baylor College of Medicine/Texas Children’s Hospital</td>
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<tr>
<td>Bellevue Hospital Center/New York University School of Medicine</td>
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<td>Emory University</td>
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<td>Duke University</td>
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<td>George Washington University</td>
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<td>Harvard University/Beth Israel Deaconess Medical Center</td>
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<td>Harvard University/Brigham and Women’s Hospital</td>
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<td>Keck School of Medicine at the University of Southern California</td>
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<td>Loma Linda University</td>
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<td>Long Island Jewish Medical Center</td>
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<td>Medical College of Georgia</td>
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<tr>
<td>New York–Presbyterian/The University Hospitals of Columbia and Cornell</td>
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<tr>
<td>Rhode Island Hospital</td>
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<td>Rush University Medical Center/Cook County Hospital</td>
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<td>The Johns Hopkins University</td>
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<td>University of Rochester Medical Center</td>
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### METHODS

A combined search of the MEDLINE, EMBASE, and CINHAL databases from 1950 to October 2008 was performed combining the terms international, emergency medicine, and fellowship. Relevant articles were reviewed and hand-searched for additional references. Online fellowship curricula and descriptive materials for all IEM fellowship programs listed in the SAEM fellowship directory were reviewed as of October 2008. Relevant knowledge and skill areas identified from these sources were organized into areas of focus. All 20 IEM fellowship directors were contacted and asked to provide input and feedback on the areas of focus that were identified.

### RESULTS

Eight articles specific to IEM fellowships were identified, two of which described a general structure for fellowship curriculum. Of the 20 IEM fellowships listed by SAEM (see Table 1), 16 had materials posted online describing their program and/or curriculum. Responses and feedback were received from seven of the IEM fellowship directors (35%). These materials were reviewed by the authors and organized into seven discrete categories of knowledge and skills, as outlined below. Strategies for knowledge attainment and evaluation of attained knowledge are also described.

### Knowledge and Skill Areas

Each of the seven focus areas is described below, along with a description of the specific goals. Overall goals...
Fellowship Goals and Objectives. The goals and objectives of an international EM fellowship include the following:

1. Develop the ability to assess international health systems and identify pertinent emergency health issues.
   a. Establish contacts and develop relationships with local health officials.
   b. Acquire knowledge of prominent endemic illnesses and comorbid factors.
   c. Evaluate available health resources, including current emergency services.
   d. List and prioritize health needs.
   e. Use available data for system evaluation.

2. Design emergency health programs that address identified needs.
   a. Design programs that integrate needs assessment with available resources.
   b. Develop skills in organization and implementation of international projects.
   c. Develop a proposal that addresses health goals, desired outcomes, funding, resources, and available implementing partners.
   d. Develop educational skills and presentation techniques.

3. Develop the skills necessary to implement EM programs abroad and integrate them into existing health systems.
   a. Develop cooperative relationships with existing medical, public health, and political organizations.
   b. Establish working relationships with other health providers.
   c. Integrate emergency medical programs into existing infrastructures.
   d. Set up education and funding mechanisms to promote program sustainability.

4. Evaluate the effectiveness of international health programs.
   a. Design an evaluation tool during the planning phases of a project to form a usable database.
   b. Develop systems of data collection for program evaluation.
   c. Maintain quality assurance indicators.
   d. Contribute to the body of literature in international health.

Skills and Measurable Objectives: Upon completion of an IEM fellowship, the fellow should be able to:

1. Integrate training in EM with knowledge of international health and apply acquired skills to clinical experience abroad by participating in at least two international experiences during the fellowship.
2. Demonstrate knowledge of public health, as demonstrated by the completion of public health coursework or supplemental training in epidemiology, biostatistics, and research methodologies.
3. Demonstrate knowledge of international health policy and administration, as demonstrated by the completion of relevant coursework or supplemental training.
4. Conduct research related to international health care as demonstrated by publishable research project(s).
5. Develop, coordinate, and participate in international educational programs for physicians, medical students, and allied health professionals.
6. Present lectures on topics relating to international EM and participate in lectures presented by other related departments.

Adapted from VanRooyen et al. 38

and objectives of the IEM fellowship program are listed in Table 2.

1. EM Systems Development

   Goal: To understand the critical components of emergency care systems (both hospital-based and prehospital) and of academic practice and education in EM and to learn to adapt these systems to best address a country’s emergency care needs.

   Simply to transplant a U.S.-type emergency care system to another country is to ignore that country’s medical culture and approach to care delivery and will not likely succeed. Fellows should be familiar with the strengths and weaknesses of different systems of emergency care delivery. These systems have developed in response to various resources, cultures, and health systems. Fellows are encouraged to work in other health systems and to perform comprehensive assessments of needs and resources before implementing any programs in EM or emergency medical services (EMS).

1.1. Needs Assessment—provides a method for analyzing care system strengths and weaknesses, available resources, and practice norms to produce prioritized recommendations for development.
   1.1.1. Hospital level
   1.1.2. Municipal level
   1.1.3. Country or regional level

1.2. Emergency Care Delivery System Models—provides knowledge of the organizational and logistic structure of different care models.
   1.2.1. Prehospital systems
   1.2.2. Hospital-based system
      1.2.2.1. Single versus multidepartment (multispecialty) models
   1.2.3. Trauma systems
   1.2.4. Urban versus rural systems

1.3. Training—provides skills necessary to plan and conduct adult medical education programs.
   1.3.1. Principles of educational theory and adult learning
   1.3.2. Certification models
   1.3.3. Train-the-trainers
   1.3.4. Mentoring
   1.3.5. Curriculum development
   1.3.6. Nursing and allied health training

1.4. EM Specialty Development—provides familiarity with stages of and important topics in the development of EM as an official medical specialty in a country.
   1.4.1. Specialty recognition
   1.4.2. National society
   1.4.3. Residency training programs
   1.4.4. Professional recruiting and incentives
   1.4.5. Relationships with other specialties
1.4.6. Standardized curriculum
1.4.7. National certification exam
1.5. Financial Models for Care Delivery—provides an understanding of basic health economics and reimbursement models.
  1.5.1. Fixed budget
  1.5.2. Fee for service
1.6. Legislative Frameworks and Legal Considerations—encourages the principle of access to emergency care for all and a familiarity with different medicolegal systems.
  1.6.1. Malpractice issues
  1.6.2. Access to emergency care

2. Humanitarian Relief

**Goal:** To become familiar with humanitarian organizations and their management and to learn to effectively deliver emergency health care in humanitarian crises and international disasters.

Fellows should gain field experience in international disasters or humanitarian crises. Depending on their career path, fellows may require familiarity with the health concerns of both indigenous and transplanted populations.

2.1. Humanitarian Organizations—introduces the roles of the various entities involved in humanitarian relief.
  2.1.1. Intergovernmental
    2.1.1.1. United Nations (e.g., OCHA, WHO, WFP)
    2.1.1.2. International Committee of the Red Cross (ICRC)
  2.1.1.3. World Bank
  2.1.2. Governmental
    2.1.2.1. Funding agencies (e.g., USAID, ECHO, DFID, JICA)
    2.1.2.2. Local Ministries of Health
  2.1.3. Nongovernmental organizations (NGOs)
    2.1.3.1. International (e.g., MSF, IRC, CARE, Oxfam)
    2.1.3.2. Local (including national Red Cross)
  2.1.4. Military
    2.1.4.1. State-sponsored (armies)
    2.1.4.2. Non–state-sponsored (militias)
  2.2. Interorganizational Coordination—provides an understanding of how relief operations are organized among humanitarian agencies.
    2.2.1. NGO coordination
    2.2.2. Military–civilian coordination
    2.2.3. Prioritization and organization of relief efforts
  2.3. Management of Relief Programs—provides skills needed to effectively lead medical relief operations as part of humanitarian crisis response.
    2.3.1. Rapid assessments
    2.3.2. Monitoring and evaluation
    2.3.3. Health team and personnel management
    2.3.4. Cultural sensitivity
    2.3.5. Community health worker training
    2.3.6. Development of sustainable programs
    2.3.7. Staff safety and security in the field
    2.3.8. Refugee health
      2.3.8.1. Nutrition
      2.3.8.2. Water and sanitation
    2.3.8.3. Shelter
    2.3.8.4. Protection
    2.3.8.5. Curative and preventive care
    2.3.8.6. Vaccination campaigns

3. Disaster Management

**Goal:** To obtain a working knowledge of disaster management principles and techniques necessary for assuming a leadership role in organizing an effective medical response to international disasters.

This core competency is not intended to be a substitute for formal disaster medicine fellowship training, but instead to cover the basics of disaster management.

3.1. Hazard Types—introduces the major types of hazards that may be encountered in various disaster situations.
  3.1.1. Environmental
  3.1.2. Industrial/transportation
  3.1.3. CBRNE (chemical, biological, radiological, nuclear, explosive) concepts
  3.1.4. Terrorist actions
  3.1.5. Complex humanitarian emergencies

3.2. Principles of Disaster Management—provides an overall framework for approaching the various stages of disaster management, with an emphasis on operational aspects of disaster response.
  3.2.1. Disaster cycle
    3.2.1.1. Mitigation and preparedness
    3.2.1.2. Planning
    3.2.1.3. Response
    3.2.1.4. Recovery
  3.2.2. Hazard vulnerability analysis
  3.2.3. Rapid assessments
  3.2.4. Disaster triage
  3.2.5. On-scene medical treatment (including psychiatric trauma)
  3.2.6. Scene management
    3.2.6.1. Scene safety/awareness
    3.2.6.2. Access
    3.2.6.3. Transportation
    3.2.6.4. Forensic evidence collection
  3.2.7. Incident command structures
  3.2.8. Logistics
  3.2.9. Communications
    3.2.9.1. Internal
    3.2.9.2. External (media relations)
  3.2.10. Search and rescue
  3.3. National Models for Disaster Management—provides an overview of the variety of national models for responding internally to disaster situations in different countries and how these differ from one another.
  3.4. International Response to Disasters—provides an overview of the processes associated with international response to disasters.
3.4.1. National capacities for responding to international calls for disaster assistance in other countries and response configurations
3.4.2. Mechanisms by which international calls for disaster assistance are initiated
3.4.3. Coordination of disaster response assets from the United States and other countries responding to disasters in other countries
3.5. Development of National and Regional Disaster Management Systems—introduces the role of the external consultant in developing disaster management systems in other countries.
3.5.1. Assessment of system strengths and weaknesses
3.5.2. Identification of opportunities for improvement
3.5.3. Development of project proposals
3.5.4. Working with stakeholder groups to build support for system changes

4. Public Health

**Goal:** To gain essential knowledge pertaining to basic public health concepts and to provide a focus on international health, health policy, and administration.

Through attainment of public health expertise, fellows will develop their capacity for understanding population-based emergency health care problems, formulating strategies for international health system interventions, and implementing research methodologies for assessing needs and measuring the impact of interventions. Public health studies can also provide valuable knowledge and skills in policy development, interventions, and implementing research methodologies for assessing needs and measuring the impact of interventions. Public health studies can also provide valuable knowledge and skills in policy development, evaluation, and implementation of public health programs.

Public health will provide a foundation for and complement many of the other core competencies in IEM. The essential public health curriculum can be divided into three categories.

4.1. Core Content—provides the basis of all public health curricula across various areas of specialization and includes the following:

4.1.1. Biostatistics
4.1.2. Epidemiology
4.1.3. Qualitative research methodology
4.1.4. Quantitative research methodology

4.2. Health Policy and Administration—introduces skills and concepts relevant to public health policy and health administration. Includes the following topic areas:

4.2.1. Organizational structure of health care systems
4.2.2. Public health administration
4.2.3. Quality management
4.2.4. Strategic health planning
4.2.5. Health finances
4.2.6. Leadership
4.2.7. Public health law

4.3. Theory of International Health—provides a theoretical basis for many international projects and health initiatives. This curriculum includes:

4.3.1. Political considerations in international health
4.3.2. Human rights
4.3.3. International humanitarian law
4.3.4. Global burden of disease
4.3.5. Health systems development
4.3.6. Health in immigrant populations (immigration patterns in the 21st century, cultural barriers, and health care access)

5. Travel and Field Medicine

**Goal:** To obtain a working knowledge of diseases and treatments that are relevant to international travelers and to become familiar with the unique components of field medicine.

This component of an IEM fellowship is important not only to the well-being of the fellow and his or her field team, but also to those patients treated in the international arena. Through the travel and field medicine curriculum, fellows will achieve a working knowledge of diseases that are relevant to international travelers and will become familiar with the unique components of field medicine. The travel and field medicine curriculum has two distinct categories:

5.1. Travel Health—travel health focuses on the health and well-being of international travelers (including health care providers in the field as well as returning travelers). Curriculum includes:

5.1.1. Epidemiology of travel-related diseases
5.1.2. Vaccinations
5.1.3. Health care risks
5.1.4. Environmental hazards
5.1.5. Provision of medical care to travelers

5.2. Field Medicine—field medicine focuses on the provision of medical care while working in an international setting. Field medicine includes the following:

5.2.1. Tropical medicine (HIV/AIDS, malaria, measles, diarrhea, and cholera)
5.2.2. Emergency medical care in resource-poor settings
5.2.3. Patient transport

6. Program Administration

**Goal:** To acquire relevant administrative knowledge and skills necessary for developing and implementing international projects.

Fellows need to understand the financial and managerial aspects of international project work, including funding mechanisms, budget development, proposal writing, and project management.

6.1. Funding—sustainable project work requires adequate resources to cover project-related expenses; this section covers the range of potential funding sources that can be targeted to fund project work and the mechanisms associated with obtaining funding.

6.1.1. Funding sources
6.1.2. Application processes

6.2. Proposal Writing—this area focuses on how to develop and structure grant proposals in response to requests for proposals as well as unstructured funding requests.

6.2.1. Scope of work statements
6.2.2. Budget design
6.2.3. Audience

6.3. Project Management—deals with the processes associated with project implementation and ensur-
7. Academic Skills

Goal: To become familiar with the skills necessary for pursuing a successful academic career in IEM, to develop familiarity with sources of information dealing with current trends in international emergency health care, and to make contributions to the general body of IEM literature.

The majority of IEM fellowship graduates to date are currently working as academic EPs with a specific research focus on IEM. A smaller number of graduates are acting as consultants to develop EM overseas or are working with international aid organizations. Based on these trends, it is important that IEM fellowships provide training in areas essential for success in academia.

This section strives to introduce the fellow to the “science” of EM health research, especially in developing countries, where there is often difficulty in obtaining precise data and reliable health information. While often similar to research done in developed settings, research in less developed countries often presents unique obstacles.

7.1. Adult Learning—because many of the interventions that fellows will design and implement are educational in nature, it is important to be exposed to relevant concepts of adult educational theory.

7.1.1. Educational theory
7.1.2. Pedagogical skills and techniques
7.1.3. Principles of curriculum development

7.2. IEM Scientific Literature—the body of scientific literature relevant to IEM is broad and includes the traditional scientific medical literature, but also the professional literature from related academic domains such as public health, health systems management, humanitarian relief, disaster management, etc.

7.2.1. Scope of IEM literature, worldwide sources
7.2.2. Literature search techniques

7.3. Research Methodologies—provides an overview of research methodologies relevant to IEM research.

7.3.1. Quantitative
7.3.2. Qualitative
7.3.3. Study designs
7.3.4. Institutional review boards

7.4. Scientific Writing—provides an overview of the important aspects of writing and manuscript development for scientific publication.

7.4.1. Organizing a manuscript
7.4.2. Writing style
7.4.3. Submission and review process

7.5. Oral Presentations—covers the skills necessary for giving effective oral presentations.

7.5.1. Organization of oral presentation content
7.5.2. Slides and visual stimuli
7.5.3. Delivery style, timing
7.5.4. Informatics skills (i.e., PowerPoint, word processing)
7.5.5. Adapting presentations to international audiences

7.6. Geographic Information Systems (GIS)—introduce basic GIS concepts that are relevant to conducting IEM research and field work.

7.6.1. Overview of GIS concepts, techniques, and applications
7.6.2. Field data acquisition techniques
7.6.3. Online data sources
7.6.4. Mapping techniques
7.6.5. Analytic techniques

7.7. Career Development—addresses career development skills that are important for success in academia.

7.7.1. Identifying mentors
7.7.2. Developing an academic portfolio
7.7.2.1. Areas of expertise
7.7.2.2. Research and field work projects
7.7.2.3. Lectures
7.7.2.4. Publications
7.7.3. Curriculum vitae/biosketch maintenance
7.7.4. Leadership skills
7.7.5. IEM professional community

Knowledge Attainment

This section includes suggestions for how the knowledge needed for IEM can best be obtained.

EM Systems Development. Domestic knowledge of many of these principles should already have been obtained during the fellow’s EM residency. Knowledge in EM residency curriculum, ED design, and administration can be gained by independent study. Participation in selected portions of administrative EM fellowships may be helpful to augment knowledge in certain areas (EM systems design, methods of quality assurance, etc). The same applies for EMS; domestic field experiences, such as combined experiences with EMS fellows (in academic centers that also have EMS fellowships), may be of benefit. This portion of the IEM fellowship does not serve as a substitute for a full EMS fellowship, but exposes the fellow to the basic elements of EMS design and implementation. Note that much of the high-income model of EMS care will often need to be adapted to be appropriate for a low-income country setting (the National Association of EMS Physicians offers a yearly 3-day course, the NAEMSP National EMS Medical Directors Course and Practicum, outlining the basics of EMS medical oversight. This is one way to gain rapid exposure to the principles of EMS. Details are available at http://www.naemsp.org/; click on “Other NAEMSP Meetings”). International knowledge of these topics is best gained by field experiences, along with reading articles pertaining to descriptions of
emergency health systems in the particular foreign country of interest.1–31

Humanitarian Relief. A combination of field experiences with NGOs and specific public health coursework pertaining to refugee health care and health systems management in developing counties. A condensed course covering these topics, such as the Health Emergencies in Large Populations (H.E.L.P.) course, is recommended. This course, coordinated by WHO and the ICRC, is offered periodically throughout the world. Another course, Public Health in Complex Emergencies, is organized by the International Rescue Committee (IRC); times and dates for future courses can be found on the IRCs website: http://www.theirc.org/). Written information pertaining to project management, including a number of books, can be obtained from the Project Management Institute (http://www.pmi.org/ Pages/default.aspx). Specific readings in the field of immigrant medicine are recommended. Additionally, research and independent projects in this area can be incorporated into other sections of this curriculum.

Disaster Management. A combination of didactic lectures and field experiences. While not assuming to be a replacement for specific disaster medicine training programs, many aspects of disaster medicine will be pertinent to the IEM fellow. Additionally, given the tremendous disparity of resources available, many aspects of the assessment and response to a disaster in a developing country will be uniquely different from that of a response to a domestic disaster. These unique aspects are best learned by didactic coursework, or assigned readings, and pertinent field experiences. Fellows are encouraged to join their local National Disaster Medical System (NDMS) “Disaster Medical Assessment Team” (DMAT), which is an excellent way to gain familiarity with how domestic disaster response is organized in the United States. There is also an excellent online e-learning program on the Office of Emergency Preparedness (OEP)/NDMS website (http://ndms.umbc.edu/), which covers a broad range of aspects of disaster medical response. Access is restricted to NDMS DMAT team members.

Public Health. The core curriculum content related to public health can be obtained by completing an MPH degree. However, this knowledge can also be acquired by attending courses or programs covering similar material such as those offered by the London School of Hygiene and Tropical Medicine and the Burnet Institute. While we do not propose that completing an MPH be mandatory for all IEM fellows, we would note that completing an MPH degree with a concentration in either international health or health policy and administration may be useful for fellows pursuing careers as future leaders, senior administrators, and policy-makers in IEM.

Program Administration. Specific courses either designed by the fellowship director and faculty or within the MPH curriculum may address various aspects of grant writing. Independent study may be required to augment this. Additionally, the fellowship director, or another individual experienced in grant writing for international projects, should include the fellow in all aspects of a particular grant. The fellow should be directed toward sources of Research Funding Announcements (RFAs) and should become familiar with their content and format. The Community of Science (COS) website (http://www.cos.com/), an online clearinghouse for research RFAs, lists thousands of research opportunities (an institutional subscription is required). The fellow should also become familiar with searching other sources, such as the USAID website, and other potential funding websites.

Travel and Field Medicine. A combination of didactic lectures and field experiences. These lectures may be a part of a fellowship course organized in collaboration with the travel health clinic, if present, or with the department of infectious diseases at the institution. Alternatively, this knowledge may be obtained by participating in a certificate program in tropical medicine (which also adequately covers travel health topics). A number of such programs are accredited by the American Society of Tropical Medicine and Hygiene (ASTMH) and are given at various times through different universities, including Johns Hopkins, Tulane, Case Western, West Virginia, Gorgas Memorial Institute of Tropical and Preventive Medicine, and internationally at the Liverpool School of Tropical Medicine and at the London School of Hygiene and Tropical Medicine. The courses range from 8 to 15 weeks and allow those who pass to sit for the certificate examination of the ASTMH. The courses cover various aspects of diagnosis and treatment of tropical diseases as well as other public health topics. Times, dates, and costs can be found on the ASTMH’s website (http://www.astmh.org/) under “Certification Programs.”

Academic Skills. Specific courses in MPH programs may address these issues, especially in relation to research and study design. Many academic medical centers have departments of faculty development that offer programming on scientific writing, adult pedagogy and medical education skills, leadership training, etc. This knowledge and skill can also be obtained via independent study coordinated by the fellowship director or didactic courses and seminars organized by the fellowship director and faculty. Review of IEM literature, with discussion at journal clubs, is another useful element for expanding the fellows’ knowledge base.

Evaluation of Attained Knowledge

This section includes suggestions for how to evaluate the knowledge attained during the fellowship experience.

EM Systems Development. Evaluation of independent study by the fellowship director.

Humanitarian Relief. Evaluation of independent study by the fellowship director. Passing the special courses in complex emergencies (ICRC or IRC courses) if the fellow chooses to pursue these courses.
**Disaster Management.** Passing grades in required courses (or evaluation of assigned readings).

**Public Health.** Passing grades in required courses and evaluation by a faculty member in the School of Public Health if the fellow is pursuing an MPH degree. Evaluation of independent study or other didactic course work by the fellowship director, if the fellow is not pursuing an MPH degree.

**Program Administration.** Passing grades in any MPH courses taken and evaluation of independent study by the fellowship director.

**Travel and Field Medicine.** Demonstration, to fellowship director, of knowledge of the core principles of travel and tropical medicine. This can be achieved by passing grades in a tropical medicine course or an internal evaluation organized by the fellowship and the department of infectious diseases or a review of independent studies by the fellowship director.

**Academic Skills.** Passing grades in related MPH courses. Evaluation of independent study by fellowship director (Table 3 [see Data Supplement S1, available as supporting information in the online version of this paper] shows a sample evaluation form).

**Field Experiences**
This section includes suggestions for field experiences and other ways of acquiring skills and experience to complement the knowledge base acquired during the fellowship period.

**EM Systems Development.** Have the fellow assist in the design of an ED overseas, in the establishment of an EM residency program, or in the creation or operation of a national EM society (previous fellows in IEM residencies have participated in each of these activities). The fellow should also participate in an international field experience that allows for a close inspection of the prehospital services provided in a typical developing country (i.e., foreign ride-alongs and foreign ED clinical work). Additionally, the fellow could participate in programs involving teaching of ACLS, ATLS, or PALS overseas to prehospital and emergency personnel. If not already obtained, it may be very helpful for the fellow to obtain instructor certification in ACLS, ATLS, and PALS.

**Humanitarian Relief.** Valuable experience will be obtained through working with an NGO or other aid group administrating a refugee camp, or responding acutely to a complex humanitarian emergency (CHE). Virtually any work experience with any governmental organization or NGO, in the headquarters or in a developing country, under the direction of a particular relief and development division will provide a valuable work experience. Field experiences should be designed to expose fellows to specific aspects of international health care. Time working within organizations should be balanced with field experiences that allow the fellow to develop and/or grow programs to improve current efforts. Additionally, while on assignment, the fellow should be encouraged to attend WHO and NGO health coordination meetings.

**Disaster Management.** Optimal field experiences would include working directly with an NGO or aid group responding to a disaster, or CHE, during the “emergency phase.” Given that these opportunities occur unpredictably, another pertinent experience would be to work with an organization (such as the Centers for Disease Control and Prevention [CDC]) doing a predisaster preparedness assessment, whereby a region’s hospital and public health disaster plans are reviewed. If international experiences are not able to be arranged, fellows could also work with local and regional disaster management groups participating in disaster planning work and planning and carrying out disaster drills.

**Public Health.** The fellow may participate in the development and/or implementation of a population-based assessment in conjunction with a field project, thereby using core public health skills from epidemiology, biostatistics, and study design. Field experiences of this kind may be offered in conjunction with MPH or other training courses or may be sought out within the fellow’s home university or hospital.

**Program Administration.** The fellow should assist in the development of at least one actual submitted grant application. Ideally, the fellow could prepare a grant in response to a request for applications and then go overseas to manage this project. A written published report on the project could then be used to fulfill the research requirement. Many other aspects of the fellowship, encompassing many of the objectives of the various field experiences, could be gained simultaneously from a quality field experience such as this.

**Travel and Field Medicine.** As above, the best field experience would be to have the fellow participate as a health care provider in a refugee setting, during an acute disaster, or in a developing tropical country with few resources. To travel to different hemispheres, and to both rural and urban environments, is encouraged (information about necessary immunizations and precautions can be obtained from the CDC website: http://www.cdc.gov). Clinical experience in a travel medicine clinic would also be useful.

**Academic Skills.** Design and implementation of a research project overseas. Presentation of findings at an international EM conference/assembly or publication in the international section of a medical journal. The fellow would be expected to attend at least one IEM conference every year and produce one abstract/publication every year based on the educational experience. The fellowship director would serve as mentor for the development of this project.

**Evaluation of Field Competency/Skills**
This section includes suggestions for how to evaluate field experiences during the fellowship period.
Evaluation forms should be completed by field mentors or supervisors (fellowship director or others). Table 4 lists a sample field competency evaluation template that can be adapted by individual programs (see Data Supplement S2, available as supporting information in the online version of this paper). An evaluation form similar to this should be completed by the field mentor, to determine whether the fellow has met the desired objectives during the particular field experience.

DISCUSSION

The proliferation of IEM fellowship training programs in North America reflects the increasing demand for emergency medical care services seen internationally, as well as a desire to develop additional education and training opportunities for EM-trained physicians who seek career paths that are focused on responding to that need. Because career paths in IEM can lead in many directions, IEM fellowship training programs and curricula need to be broad enough to have the flexibility to meet the range of needs and interests of their fellows. Conversely, if IEM is to develop as a coherent subspecialty within EM, we need to define the knowledge and skill areas that constitute a common body of knowledge across training programs, so we can refine and advance that body of knowledge through research, education, and practice.

In this article, we have attempted to take a first step toward defining a common body of knowledge for IEM, by summarizing the common knowledge and skill areas found in IEM training programs at the present time. The authors do not propose this set of knowledge and skill areas as a standard, but rather as a resource for individual IEM fellowship directors as they develop and refine their own curricula. Our aim is for this document to stimulate further thought and discussion about the knowledge and skill areas that should be included in IEM fellowship training.

There are limitations to our work that should be noted. Although we attempted to carry out a systematic review of curricula from all IEM fellowship programs and to obtain feedback from all IEM fellowship program directors, we were unable to obtain materials or feedback from some programs. This may limit the degree to which our results are representative of all IEM fellowship programs.

CONCLUSIONS

Based on a review of available curricula from international emergency medicine fellowship training programs and input from the international emergency medicine fellowship program directors, we have compiled the common knowledge and skill areas from these into seven areas of focus. These are presented together with examples of how these areas of knowledge are commonly attained and evaluated as a resource for further international emergency medicine fellowship program curriculum development.

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References


Supporting Information:
The following supporting information is available in the online version of this paper:
Data Supplement S1. Sample IEM fellowship evaluation form.
Data Supplement S2. Sample field competency evaluation template.
The documents are in PDF format.
Please note: Wiley Periodicals Inc. is not responsible for the content or functionality of any supporting information supplied by the authors. Any queries (other than missing material) should be directed to the corresponding author for the article.