The International Emergency Medicine (IEM) Literature Review, now in its sixth year, began as an effort to summarize and categorize the growing field of IEM. The current mission of the review is to highlight and disseminate high-quality global EM research in the fields of EM development, disaster and humanitarian response, and emergency care in resource-limited settings. The goals of the review are to illustrate best practices, stimulate additional research, and promote further professionalization of the field of IEM. This task becomes more challenging every year, as the field of IEM continues to grow exponentially, and the body of IEM literature being produced has evolved from a pond to a sea.

As we wade through this body of work, we find that the boundaries of IEM itself have expanded. In the past several years, new issues such as pandemic influenza, the growth of EM as a specialty throughout the world, and increasing access to digital resources have provided new and fertile ground for a discussion on what constitutes “international emergency medicine.” Using our overall mission and goals as a guide, this year we refined the screening criteria and limited the search to original research and review articles. In addition, we created a standardized point system to grade each article that passed the initial screening process. Thousands of articles presented themselves in the initial searches, and through our screening and scoring processes, we chose 27 individual articles for full review.

For the first time this year, we also undertook a search of the gray literature. Gray literature has been defined as any material not produced by an

Abstract
The International Emergency Medicine (IEM) Literature Review aims to highlight and disseminate high-quality global EM research in the fields of EM development, disaster and humanitarian response, and emergency care in resource-limited settings. For this review, we conducted a Medline search for articles published between January 1 and December 31, 2010, using a set of international and EM search terms and a manual search of journals that have produced large numbers of IEM articles for past reviews. This search produced 6,936 articles, which were divided among 20 reviewers who screened them using established inclusion and exclusion criteria to select articles relevant to the field of IEM. Two-hundred articles were selected by at least one reviewer and approved by an editor for scoring. Two independent reviewers using a standardized and predetermined set of criteria then scored each of the 200 articles. The 27 top-scoring articles were chosen for full review. The articles this year trended toward evidence-based research for treatment and care options in resource-limited settings, with an emphasis on childhood illness and obstetric care. These articles represent examples of high-quality international emergency research that is currently ongoing in high-, middle-, and low-income countries alike.

This article is not intended to serve as a systematic review or clinical guideline but is instead meant to be a selection of current high-quality IEM literature, with the hope that it will foster further growth in the field, highlight evidence-based practice, and encourage discourse.

ACADEMIC EMERGENCY MEDICINE 2011; 18:872–879 © 2011 by the Society for Academic Emergency Medicine
organization whose primary function is publication and includes theses, technical reports, white papers, newsletters, slide presentations, government documents, and private and nonprofit organization reports. Content in the gray literature domain has grown much more rapidly than the body of material available through formal publishing services. The concept of gray literature was developed around finding information of value to researchers in items such as unpublished research reports and similar, more structured publications. In addition, what constitutes gray literature has been expanding rapidly with the growth of internet use and on-line information sources, such as conference proceedings, blogs, video postings, and social networking sites. These expanding sources of potentially useful information place an increasing burden on the user to perform due diligence regarding the source and validity of posted information he or she may wish to use. With the widening scope of gray literature has come increasing discussion regarding assessment of validity of the information presented. While we did not feel that any articles from the gray literature search met our criteria for inclusion in the 2010 review, we anticipate that this may change in the coming years.

While this year’s review spans the field of IEM, it is by no means a comprehensive review of the existing IEM literature, nor is it meant to be used as a clinical guideline. Rather, it is meant to provide the IEM practitioner and researcher with insight into the current field of work and generate opportunities for new learning and research.

METHODS

Each year, the editorial board for the IEM Literature Review Group produces a procedure manual that outlines in detail the methodology for its search, screening, scoring, and reviewing processes. As a review article, no prior ethical or institutional review board approval was sought for this article. None of the authors or reviewers reported any conflict of interest. Although reviewers and editors were not blinded to the authors of the articles included in the review or their affiliations, in all cases both reviewers and editors recused themselves from scoring or reviewing any articles in which they may have been directly or indirectly involved.

The initial search was conducted in two periods, the first from January 1 to August 31, 2010, and the second from September 1 to December 31, 2010. We used PubMed to search Medline for original research or review articles that contained at least one “international” search term and one “emergency medicine” search term. The EM search terms included emergency medicine, refugees, emergency treatment, relief work, rescue work, acute disease, humanitarian, critical illness, war, pre-hospital, conflict, triage, disasters, multiple trauma, injuries, internally displaced persons, and emergency medical services. The international search terms included world health, developing countries, international, global, tropical medicine, third world, middle income countries, and low income countries. A manual search of journals that previously have published a significant number of IEM articles that were included in our prior reviews was also performed. This year, the following journals were included in the manual search: Academic Emergency Medicine, Annals of Emergency Medicine, Bulletin of the World Health Organization, Emergency Medicine Journal, and Prehospital and Disaster Medicine.

This year, we limited our search to articles published in English, Spanish, French, Japanese, Chinese (Mandarin), German, and Dutch based on the linguistic capacity of our reviewers and editors. All studies were limited to human subjects only, and news articles and letters were excluded.

The total number of articles produced by our PubMed search for 2010 was 4,615, including 4,476 English, 40 German, 32 Japanese, 31 French, 28 Spanish, 5 Chinese, and 3 Dutch. The total number of articles produced by our manual search for 2010 was 2,321. The 6,936 articles produced by these two searches were divided up amongst 20 reviewers for initial screening based on their relevance to the field on IEM. Two-hundred articles were deemed appropriate by at least one reviewer and approved by his or her editor for formal scoring of their overall quality and importance.

Once selected for scoring, the full-text article was obtained and categorized as either an original research or a review article. Each article was then scored by two separate reviewers using a grading scale that ranged from 0 to 25 (Table 1). All articles with a score difference between reviewers that was greater than one standard deviation above the median score difference were rescored by an editor. The new score was then used as the official score for the article. Overall, 27 articles had a score of 21 or greater and were chosen for formal review. These articles were then distributed to reviewers who produced summaries and critiques of the articles, which were edited by their individual editors.

This year, we also introduced a new “gray literature search,” the goal of which was to identify new IEM research conducted by government agencies, local or international nongovernment organizations, or other entities that may not have been published in an indexed journal. A search of the Internet for documents related to the underlying mission of the review was undertaken using phrases constructed from our mission statement. Trial searches were performed using “advanced search” mode in different search engines: Google, Lycos, Dogpiles, AltaVista, and MetaCrawler. Structured collections of gray literature were also reviewed for relevant publications (Table 2). Google advanced search was chosen as seeming to have the most adaptable input interface and results management. Search string combinations were then constructed combining elements of the mission statement as they might appear within either titles or bodies of documents. The search structure was limited to Adobe Portable Document File (.pdf) file types to capture more formalized documents. A set of exclusion terms was constructed to eliminate formal publishing and cataloging services, including the National Library of Medicine, PubMed, and commercial publishers. Searches of items from the title and short excerpts presented in the results led to further related documents. The gray literature search did not uncover
any IEM original research studies or formal literature reviews; therefore, no findings from the gray literature search were included in this year’s review.

RESULTS

The articles chosen for final review are listed in Table 3 and categorized as EM development, humanitarian and disaster response, or emergency care in resource-limited settings. An annotated bibliography, including final summary and critical analysis of each article, can be found in Data Supplement S1 (available as supporting information in the online version of this paper).

DISCUSSION

The articles selected for the 2010 review show a clear emphasis on the development of new evidence-based, low-cost interventions for low- and middle-income countries (LMICs), as well as the effects of humanitarian disasters on health. They cover many diverse fields within development, disaster and humanitarian response, and health care in resource-limited settings, with a focus on prevention, treatment, and training and education. There is also a predominance of articles related to children’s health and to the health of pregnant women and newborns.

Emergency Care in Resource-limited Settings

By far the largest number of articles could be categorized as evidence-based EM practice in resource-limited settings, in particular, practices relating to pediatric EM. Geduld et al.5 validated the Broselow tape as the best estimate for children’s weight in Western Cape, South Africa. Kabra et al.6 looked at evidence-based
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<th>Category</th>
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<td>Emergency care in resource-limited settings</td>
<td>Geduld⁵</td>
<td>Validation of weight estimation by age and length based methods in the Western Cape, South Africa population.</td>
<td>Emergency Medicine Journal</td>
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<td>Kabra⁶</td>
<td>Antibiotics for community-acquired pneumonia in children.</td>
<td>Cochrane Database</td>
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<td>Munos⁹</td>
<td>The effect of oral rehydration solution and recommended home fluids on diarrhea mortality.</td>
<td>International Journal of Epidemiology</td>
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<td>Allen¹⁰</td>
<td>Probiotics for treating acute infectious diarrhoea.</td>
<td>Tropical Medicine &amp; International Health</td>
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<td>Rabbani¹¹</td>
<td>Green banana-supplemented diet in the home management of acute and prolonged diarrhea in children: a community-based trial in rural Bangladesh.</td>
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<td>Levine¹²</td>
<td>Ultrasound assessment of severe dehydration in children with diarrhea and vomiting.</td>
<td>Academic Emergency Medicine</td>
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<td></td>
<td>Brooks¹⁴</td>
<td>Influenza is a major contributor to childhood pneumonia in a tropical developing country.</td>
<td>Pediatric Infectious Disease Journal</td>
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<td></td>
<td>Winikoff¹⁵</td>
<td>Treatment of post-partum haemorrhage with sublingual misoprostol versus oxytocin in women not exposed to oxytocin during labour: a double-blind, randomized, non-inferiority trial.</td>
<td>Lancet Infectious Diseases</td>
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<td>Blum¹⁶</td>
<td>Treatment of post-partum haemorrhage with sublingual misoprostol versus oxytocin in women receiving prophylactic oxytocin: a double-blind, randomized, non-inferiority trial.</td>
<td>Lancet Infectious Diseases</td>
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<td></td>
<td>Barros¹⁷</td>
<td>Global report on preterm birth and stillbirth.</td>
<td>BMC Pregnancy and Childbirth</td>
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<td>Mwansa-Kambafwile¹⁸</td>
<td>Antenatal steroids in preterm labour for the prevention of neonatal deaths due to complications of preterm birth, mortality and health among internally displaced persons.</td>
<td>International Journal of Epidemiology</td>
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<td></td>
<td>Donaldson²⁰</td>
<td>An intervention for reducing secondary traumatization and improving professional self-efficacy in well baby clinic nurses following war and terror: a random control group trial.</td>
<td>The Journal of Trauma</td>
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<td></td>
<td>Berger²¹</td>
<td>Don’t let the suffering make you fade away: an ethnographic study of resilience among survivors of genocide-rape in southern Rwanda.</td>
<td>International Journal of Nursing Studies</td>
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<td></td>
<td>Zraly²²</td>
<td>British military experience of pre-hospital paediatric trauma in Afghanistan.</td>
<td>Social Science &amp; Medicine</td>
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<td></td>
<td>Walker²³</td>
<td>Defining a standard medication kit for prehospital and retrieval physicians: a comprehensive review.</td>
<td>Journal of the Royal Army Medical Corps</td>
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<td>Disaster and humanitarian response</td>
<td>Sadewasser²⁴</td>
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<td>Emergency Medicine Journal</td>
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antibiotic use in community-acquired pneumonia in children, while Bouyou-Akotet et al. demonstrated that a pediatric artesunate-mefloquine formulation was efficacious, safe, and well-tolerated for treatment of malaria in African children. Finally, Pilger et al. were able to show that treating the entire household with ivermectin lengthened the amount of time free from head lice infestation in children.

Acute diarrhea was also well researched in the past year. Several studies looked at treatment options including Munos et al., who conducted a systematic review of the effects of oral rehydration solution and recommended home fluids on diarrhea-associated mortality; Allen et al., who looked at probiotics as having a safe and beneficial role in the treatment of acute infectious diarrhea; and Rabbani et al., who demonstrated that green banana is effective in decreasing the duration of illness in both acute and prolonged diarrhea for children being treated at home. Levine et al. used ultrasound measurement of the aorta-to-inferior vena cava ratio as an adjunct in the diagnosis of severe dehydration in children with diarrhea in a resource-limited setting. Respiratory illness in children was also well represented in our review. Ghimire et al. reviewed a successful community-based intervention in Nepal that employed community health worker volunteers to diagnose, treat, and appropriately refer patients to health care facilities to combat acute diarrheal and respiratory illnesses and the effect of those interventions on child mortality. Brooks et al. looked at the influence of influenza as a significant contributor to childhood pneumonia in a tropical setting.

Another clear area of IEM research in 2010 was related to pregnancy. Winkoff et al. demonstrated that misoprostol is a reasonable alternative for postpartum hemorrhage when oxytocin is not available. Blum et al. conducted a double-blinded, randomized trial showing that sublingual misoprostol is equivalent to oxytocin in the setting of postpartum bleeding in women who have been prophylactically exposed to oxytocin during the third stage of labor. Barros et al. reviewed the effectiveness of interventions related to preterm birth and stillbirth and Mwansa-Kambafwile et al. reviewed the effectiveness of antenatal steroids for reducing mortality in preterm labor neonates.

Humanitarian and Disaster Response

Several strong studies emerged in the area of humanitarian and disaster response, which looked at the effects of population displacement, war, and trauma on health. Feikin et al. researched internally displaced persons as a result of the 2009 Kenyan postelection violence and found that they were at greater risk for death due to HIV and for hospital admission for childhood illness. Donaldson et al. conducted a cross-sectional household survey assessing the increased injury burden within the war-affected Baghdad Governorate of central Iraq. The postconflict setting was evaluated by Berger and Gelkopf, showing that improved clinical and psychosocial training among well-baby clinic nurses working in regions exposed to war and terror decreased secondary traumatization. Zraly and Nyirazinyoye evaluated the expression of resilience in two different postgenocide support groups in Rwanda. The final two papers in this category both looked at air medical services in the emergency setting. Walker et al. reported on a prehospital helicopter-borne response team deployed in Afghanistan, while Sadewasser et al. reviewed an Australian air medical service to provide a standardized, evidence-based list of essential prehospital medications needed for response.

EM Development

As shown by the articles included in this year's review, development of the specialty is becoming more focused on diseases with high burdens of morbidity and mortality, such as road traffic accidents, HIV, tuberculosis, and sexually transmitted infections (STIs). Road traffic accidents in resource-limited settings cause a large burden of disability and require multidisciplinary efforts.
to effectively address the problem. This was reviewed in detail by Schmucker et al.25 Ranney et al.26 looked at an ED-based sexual assault assessment and treatment center in Kenya that was able to provide high rates of HIV prophylaxis, STI treatment, and emergency contraception without the addition of significant external resources, while Alam et al.27 reviewed STI partner notification and discussion of barriers to notification in developing countries. Corbett et al.28 showed that provider screening for tuberculosis, based on symptoms alone, could safely identify patients at very low risk for tuberculosis infection—limiting the need for testing, even among individuals who are HIV positive.

The effect of both EM training and referral systems were represented in this year’s article selections as well. Nakahara et al.29 evaluated referral systems for traumatically injured patients in Cambodia. Two studies investigated obstetric training programs and demonstrated the importance of focused research that looks at all aspects of care in resource-limited settings. Van Lonkhuizen et al.,30 looking at graduate-trained health professionals and excluding traditional birth attendants, showed training programs in emergency obstetric care may improve quality of care and overall outcomes. Further research on this issue by Carlo et al.,31 however, seemed to show that training courses in neonatal care for birth attendants did not decrease the mortality of very-low-birth-weight infants in the developing world.

Gray Literature

Finally, while we did not include any articles obtained from the gray literature search, the growing digital field of informal publication is worth discussing. The vast amount of information available on the Internet includes much that may be useful to persons interested in the various aspects of IEM. Many reports of projects currently in process or recently completed offer insights for which there currently is no good forum for exchange among colleagues. Searching for such information is currently a tedious process requiring multiple searches with variations on search strings in an attempt to capture the varied ways in which a concept may be expressed, in either the title or the text of available documents. Searching through and reading documents from the gray literature offers an opportunity to develop a good sense of the spectrum of international emergency medical care from local conditions to global policy, as well as opportunities for involvement in the process of improving global emergency medical care.

CONCLUSIONS

International emergency medicine is an ever-changing and fast-growing field. As the specialty expands, the relevant body of work has increased exponentially in the past few years. Choosing 27 articles from the existing pool of qualified articles was a daunting task. These articles were chosen to represent examples of both high-quality and high-impact international emergency medicine research currently being conducted in nearly every part of the world. It is by no means an exhaustive list of articles, nor is it meant to be. Rather, it is a sampling of the current literature, which we hope will foster further growth in the field, highlight evidence-based practice and encourage global discourse.

References


Humanitarian and Disaster Response


Emergency Medicine Development


APPENDIX A

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