

INTERNATIONAL EMERGENCY MEDICINE

Capacity building for emergency care: Training the first emergency specialists in Myanmar

Georgina Ann PHILLIPS,^{1,2} Zaw Wai SOE,^{3,4,5} James Han Boon KONG^{6,7} and Chris CURRY^{8,9}

¹Emergency Department, St Vincent's Hospital, Melbourne, Victoria, Australia, ²The University of Melbourne, Melbourne, Victoria, Australia, ³Yangon General Hospital, Yangon, Myanmar, ⁴Yangon Orthopaedic Hospital, Yangon, Myanmar, ⁵University of Medicine (1), Yangon, Myanmar, ⁶School of Public Health, Faculty of Medicine, University of Hong Kong, Hong Kong, ⁷Asia Healthcare International, Hong Kong, ⁸Emergency Department, Fremantle Hospital, Fremantle, Western Australia, Australia, and ⁹The University of Western Australia, Perth, Western Australia, Australia

Abstract

Objectives: The Myanmar Ministry of Health has formed a partnership with Australasian professional colleges and international medical specialists to deliver a comprehensive programme for emergency care training and development. We describe this programme, emphasising the training of the first emergency specialists for Myanmar.

Methods: Eighteen junior specialists (EM18) joined a new postgraduate diploma in emergency medicine (Dip EM) through the University of Medicine (1) (UM1), Yangon. Diploma content included an introductory course, clinical rotations, 2 months in the emergency receiving centre (ERC) of the Yangon General Hospital (YGH) supervised by a volunteer Australasian emergency physician (FACEM), several short courses and an educational visit to Hong Kong. Curriculum and assessments comprising written and oral exams were devised and delivered by volunteer FACEMs and Hong Kong specialists.

Results: All EM18 completed the 18 month programme and passed the final assessments to graduate in February 2014. Course strengths included the

supervised clinical rotation to the ERC and short course teaching on emergency medical, surgical, trauma, paediatric and disaster topics. The educational visit to Hong Kong enabled the EM18 to visualise more advanced EM systems that could be adapted to the Myanmar context. The participating international clinicians provided expert strategic advice on ED design, staffing, equipment, nursing and pre-hospital systems to leaders within universities, hospitals and the Ministry of Health.

Conclusion: The first Myanmar postgraduate diploma in EM provides an example of collaborative and responsive clinical health capacity building in a context of very limited resources.

Key words: *capacity building, educational activities, emergency medical services, emergency medicine, international educational exchange.*

Background**Myanmar, health systems and emergency care**

Myanmar, with an ethnically diverse population of around 60 million, is a

Key findings

- International expert clinicians and local stakeholders collaborated to complete a unique training programme for the first EM specialists in Myanmar, within the local resource context.
- ED-based FACEM teaching, short courses and an international educational visit were considered most important to changing knowledge, attitude and clinical practice for emergency care.
- Partnerships (including with AVI) are crucial to ongoing training, future sustainability and the provision of essential support to the new Myanmar EM specialists who are now leading clinical emergency care in their hospitals.

nation emerging from half a century of closed military rule and international isolation.¹ Systems of healthcare delivery and medical education persist from the former British colonial administration, yet one of the world's lowest expenditures on health has resulted in deteriorating infrastructure and extremely poor health outcomes.² Injuries from all causes but particularly road traffic events are the leading cause of morbidity and second highest cause of death, alongside other acute pathologies such as sepsis, gastroenteritis, heart disease, respiratory infections and obstetric complications.³

Myanmar, like many low Human Development Index⁴ countries, has the double burden of both communicable

Correspondence: Dr Georgina Ann Phillips, Emergency Department, St Vincent's Hospital, PO Box 2900, Fitzroy, VIC 3065, Australia. Email: drgeorgina@gmail.com

Georgina Ann Phillips, MBBS, FACEM, Emergency Physician, Coordinator of International Programmes, Honorary Lecturer; Zaw Wai Soe, MBBS, MMedSc (Ortho), FRCS (Glasgow), DrMedSc (Ortho), DipMedEd, Professor of Orthopaedics and Traumatology, Professor of Emergency Medicine; James Han Boon Kong, MBBS, FRCE, FHKAM (Surgery), FRACS, Honorary Clinical Associate Professor, Surgeon, Director; Chris Curry, BMedSc (Hons), MBBS, FACEM, DTM&H, Emergency Physician, Clinical Associate Professor.

Accepted 13 August 2014

and non-communicable disease. Unlike neighbours in the South Asian region,⁵ Myanmar does not have developed clinical services in emergency care, nor developed pre-hospital or emergency medicine systems (EMS).⁶ These are recognised as essential components of an integrated response towards addressing the Millennium Development Goals.⁷

Impetus for the programme

In response to Cyclone Nargis in 2008, the Myanmar Medical Association (MMA) introduced Primary Trauma Care (PTC) courses. These aim to train doctors and nurses in the skills, knowledge and attitudes required to provide systematic and effective trauma care in a resource-limited environment.⁸ The PTC programme triggered critical thinking about environments of trauma care provision and enabled an expansion of local vision for emergency care and emergency medicine (EM) training.⁹ Considerable advocacy by senior orthopaedic surgeons and a request by the Myanmar Minister for Health led to senior clinical, hospital, academic and government leaders meeting in January 2012 to establish a consensus for EM development. Representatives of the Australasian College for Emergency Medicine (ACEM), the Royal Australasian College of Surgeons (RACS) and the International Federation for Emergency Medicine (IFEM) provided expert input and became formal partners with the Ministry of Health (MoH) to assist in a comprehensive emergency care development plan.

Myanmar was preparing to host the South East Asia (SEA) Games in December 2013 and the Association of South East Asian Nations (ASEAN) in 2014. These responsibilities brought additional impetus and created a timeline for achieving practical outcomes.¹⁰

Stakeholder engagement and collaborative programme development

The consequent Myanmar Emergency Medicine Development Programme (MEMDP) incorporated three phases. Phase 1 was the rapid training (through a postgraduate Diploma) of

junior specialists to become the first emergency physicians, to provide emergency care during the SEA Games and to lead subsequent development of EM. Phase 2 is the establishment of EM as a medical specialty with an appropriate training programme and Phase 3 is the development of mature EM, ED and emergency care systems through formal academic and government pathways. The MEMDP has not been a funded programme. Although many short components of the programme have received sponsorship through a variety of sources, the overall administration and delivery of the MEMDP has been *pro bono*.

Orthopaedic surgeons, the local champions for EM, joined with MoH and academic representatives to form a Myanmar EM Development Committee, answerable to the Minister for Health and responsible for strategic oversight and the building of national consensus for the programme.¹¹ A team of emergency physicians, surgeons and anaesthetists from Hong Kong and Australia was built to provide expert advice and to deliver various components of the Phase 1 programme.

International exchange between Myanmar and Australia enhanced local capacity to drive strategic direction within Myanmar.^{12,13}

Aims

The focus of this paper is the Phase 1 component of the MEMDP. It describes the creation and delivery of the postgraduate Diploma in EM, evaluates the programme and discusses how it may serve as a model of collaborative capacity building in emergency care for other environments.

Programme delivery (methods)

Diploma of EM structure and curriculum

Key international collaborators (GAP, CC, JHBK) rapidly created a basic outline for the Diploma in EM (Dip EM), which was approved by the MoH and the University of Medicine (1) (UM1) in Yangon, the institution conferring the degree. An 18 month

programme, the Dip EM commenced in June 2012 with an introductory course prepared specifically for the Myanmar context.¹⁴ Another 10 recognised short courses were delivered, covering adult and paediatric life support, trauma, disasters, toxicology, cardiac emergencies, pain, surgical skills and clinical teaching skills. Participants rotated through the core clinical disciplines of medicine, paediatrics, orthopaedics/trauma, surgery, anaesthetics and obstetrics/gynaecology, and spent 3 weeks in Hong Kong to visit EDs and training centres. An 8 week rotation to the Emergency Receiving Centre (ERC) of the Yangon General Hospital (YGH) required Australasian emergency physicians (FACEMs) to supervise clinical teaching in EM. Final exams were scheduled to allow preparation time for the SEA Games at the end of 2013. Table 1 provides an overview of the short courses, funding sources and timelines.

The curriculum was based on resources from the IFEM¹⁵ and ACEM,¹⁶ emphasising the primacy of learning through involvement with patient care. Learning objectives focused on competency in management of undifferentiated, acutely unwell patients, particularly for resuscitation. Supervising local specialist professors used their discretion on key learning topics during clinical rotations, and were asked to complete a structured trainee assessment form. Flexibility around final assessment was incorporated into the curriculum document for the short courses, ERC-based and clinical rotations. The final examinations used written (multi-choice and short answer visual aid questions) and oral (skill stations and scenario-based oral structured clinical exams) formats to test knowledge and competency for EM care.

Local participants

Recruitment commenced in early 2012. Because knowledge about EM among the Myanmar medical community was low, several meetings involving local and international champions for EM were held. Eighteen junior specialists joined the programme from orthopaedics (9), anaesthetics (6), pae-

TABLE 1. Overview of short courses, funding sources and timelines

Date	Course	Supported by...		
2012	June	Myanmar EM Introductory Course	MEMIC	DAP
	August	Primary Trauma Care Provider & Instructor Course	PTC	RACS
	September	Surgical (Basic) Skills Course	ASSET	RACS
	November	Advanced Trauma Life Support	ATLS	RACS
2013	February	Emergency Life Support	ELS	ISTIH & ACEM
	February	Major Incident Medical Management Support	MIMMS	AusAID
	March	Teaching on the Run	TOR	ISTIH
	March	Essential Pain Management	EPM	RACS & Others
	March	Thailand Observation Study	Thai	Thailand
	April	HK Observation Study & ACLS; ED US	HKOSV	MM-RACS-HKG
	June	Advanced Paediatric Life Support	APLS	RACS & Others
	August	Trauma Course . . . Alfred Trauma Unit	ALFRED	AusAID
	August	Toxicology Seminar and Course	TOX	ACEM

ACEM, Australasian College for Emergency Medicine; AusAID, Australian Agency for International Development; DAP, Australian Ambassador's Direct Aid Programme; HKG, Hong Kong donors; ISTIH, International Skills and Training Institute in Health; MM, local Myanmar donors; RACS, Royal Australasian College of Surgeons.

diatrics (1), general surgery (1) and general medicine (1). Participants had to commit to participating as EM leaders during the SEA Games, but were free to return to their parent specialty afterwards if they did not choose to commence a new career in EM. Incentives announced by the MoH included a commitment to creating EDs in hospitals, promotions and a career structure in EM.

Participants (named the 'EM18') were based in Yangon, Mandalay and the new capital, Nay Pyi Taw (NPT). They undertook their clinical rotations at their home hospitals, supervised by local professors. From December 2012 onwards, all EM18 rotated in batches of four or five to the YGH for the ERC rotation supervised by a volunteer FACEM. Apart from during the ERC rotation, the EM18 were required to continue clinical government service in their original specialty as well as participate as EM trainees in a different specialty rotation. All EM18 also worked to varying extents in private clinical practice after hours for essential income. Government service promotions required some of the EM18 to move hospital or city during their training.

International and local faculty

More than 50 international specialists provided short-course training

coordinated through a core group from Australia and Hong Kong. Five FACEMs volunteered for 7–19 weeks based at the YGH ERC to supervise EM training.¹⁷ In August 2013 a FACEM placed through the Australian Volunteers for International Development (AVID)¹⁸ programme commenced a formal long-term position as Lecturer/Advisor in EM with the UM1 and so contributed to the final stages of the Dip EM.

Local professors supervised clinical rotations in their specialty. Some provided a structured learning programme based on the Dip EM curriculum.

Six international emergency physicians paired with six local professors for final examinations coordinated and invigilated by an international and local team.

Delivery of programme

All short courses were delivered in English using adult learning principles, hands-on learning and interactive teaching. Except for the Myanmar EM Introductory Course (MEMIC), short course participation was extended to include other specialists, junior doctors, relevant health administrators and nurses. The EM18 were trained as instructors for some courses.

The daily teaching by the supervising FACEM in the YGH ERC adopted

a structure focusing on clinical work spread across the three sections of the ERC (trauma, medical and surgical) with opportunistic, bedside teaching during the mornings, followed by facilitated case-based discussions, ECG, X-ray and visual aid tutorials and a structured teaching session covering core topics in the afternoons.

During rotations to specialties, learning was primarily through observation, with a structured didactic teaching programme incorporated at some sites.

During the Hong Kong visit a comprehensive professional, educational and social programme provided a stimulating learning experience, which also included a formal cardiac life support short course and an ultrasound workshop.

The Thai Ministry of Health sponsored some of the EM18 to Bangkok for specific training in disaster, pre-hospital and retrieval medicine.

The final 6 weeks were dedicated to reinforcing key concepts and to exam preparation.

Logistics

Liaison between international contributors and local coordinators and the organising of visas, accommodation and travel, was done primarily by the Hong Kong lead coordinator (JHBK).

Australian Volunteers International (AVI) administered the first long-term FACEM placement and expanded their engagement to include two ambulance trainers focusing on pre-hospital system development (Phase 3 of the MEMDP).

The local EM Development Committee secured the release of the EM18 to attend short courses, overseas trips and rotations away from their parent discipline.

The UM1 wanted to be exposed to modern assessment practices, so the final exam structure, preparation and delivery was conducted under the direction of FACEM coordinators. The UM1 provided administrative support to ensure acceptability by the University Academic Board and the MoH.

Evaluation

With the approval of the UM1 Ethical Research Committee, we used a structured questionnaire involving ratings of the entire Dip EM course with a Likert scale, as well as qualitative feedback to evaluate the programme. For quantitative data, we collapsed responses into three variables (disagree, unsure, agree) and used simple analysis using percentages and Adjusted Wald 95% confidence intervals. Two researchers (GAP and CC) separately performed a thematic analysis on the qualitative data and then discussed and agreed on key themes emerging from participants comments. Table 2 illustrates how EM understanding and confidence, and course components were rated. From the qualitative data, the Hong Kong visit was rated the most enjoyable component of the programme, with the ERC-based teaching at the YGH and short courses the most useful and relevant. Table 3 groups comments into themes with some illustrative quotes.

Problems identified early in the programme centred primarily on rotations to specialties. Many were delayed, truncated and insufficiently supervised, and both EM18 and supervising professors felt inadequately briefed about the learning objectives. Furthermore, the need to continue in parent discipline government service resulted in insufficient time for adequate ex-

posure to emergency care issues across specialties. The EM18 were often exhausted and distracted by competing responsibilities.

The examinations provided objective assessment. Seventeen of the EM18 passed in October 2013 and the eighteenth trainee passed supplementary examinations held in February 2014. From a service delivery perspective, the leadership and coordination provided by the EM18 for the SEA Games confirmed the effectiveness of the programme. Subsequently, 10 of the EM18 chose to continue a career in EM, staffing the evolving EDs at YGH and the NPT hospital.

The additional work of the core FACEMs in developing ED design, staffing and equipment guidelines for the MoH and key hospitals, plus in pre-hospital and nurse training, were essential components of the MEMDP.¹⁹

Although not measured, the impact of a FACEM and EM trainees as a daily presence in the ERC at YGH created a paradigm shift in how care is delivered. Previously, life-saving interventions for critical patients in the ERC were delayed or absent. Patient care was fragmented and commonly delivered by junior, inexperienced doctors. The EM teaching programme modelled a patient-centred approach to care with rapid recognition, intervention and advocacy to save lives. Although teaching was the primary focus, direct action by the EM18 (supported by the visiting FACEM in critical situations) resulted in improved outcomes for some emergency patients. Examples include rapid basic and advanced airway management for trauma, early cardiac life support for myocardial infarction, early recognition and aggressive fluid resuscitation for shock, early relief of pain, and early treatment of tetanus.

Discussion

Positive outcomes

This capacity building programme has established the beginnings of EM for Myanmar. A training programme and model of clinical service has been introduced.²⁰ Newly trained EM specialists are leading change in patient-

centred care and taking ownership of critical issues such as ED staffing, ED design and equipment and the introduction of ED systems such as triage. Through the highly visible activities and advocacy of visiting international faculty, daily FACEM teaching in the YGH ED and now clinical emergency care by new Myanmar specialists, knowledge and interest in EM is increasing.

Despite half of the EM18 choosing not to pursue a full time career in EM, all the graduates have new skills and knowledge, and are committed to educating and advocating for EM in their professional environments.

Collaboration between Myanmar, Hong Kong and Australia has transcended national, cultural and medical discipline barriers to deliver an effective training programme. A shared vision, plus the hard work of advocacy and logistical organisation ensured all components of a complicated curriculum were delivered. In 2009, when the PTC course was introduced, it was not possible for foreigners to visit a hospital in Myanmar. By 2014 the Dip EM was embedded in hospital, university and government structures, illustrating the strength, vision and effectiveness of the Myanmar EM Development Committee and the acceptability of the international collaborative programme.

Participants have surmounted the lack of overall programme funding. Faculty have not been motivated by financial reward, but by the desire to teach, gain experience and share knowledge. The absence of a rigid financial framework has allowed a degree of flexibility and responsiveness in these initial stages.

Challenges and lessons learnt for change

Some components of the Dip EM require improvement. The rapid timeframe for commencement and initial gaps in the curriculum meant that the clinical specialty rotations and supervising professors were insufficiently prepared, had little experience and few resources. Teaching was therefore inconsistent and assessment from the clinical rotations could not be incorporated into the final

TABLE 2. Ratings of EM understanding, confidence and course components (total, n = 18; CI, 95% confidence intervals)

Question	Disagree and Strongly Disagree n (%) [CI]	Unsure n (%) [CI]	Agree and Strongly Agree n (%) [CI]
Before I started the Dip EM, I had a good understanding of what EM was	12 (67%) [44–84%]	4 (22%) [8–46%]	2 (11%) [2–34%]
Before I started the Dip EM, I had the right skills and knowledge for EM	10 (56%) [34–75%]	6 (33%) [16–56%]	2 (11%) [2–34%]
Before I started the Dip EM, I was confident to treat emergency patients in my hospital	9 (50%) [29–71%]	7 (39%) [20–61%]	2 (11%) [2–34%]
Now that I have completed the Dip EM, I have a good understanding of what EM is	0 (0%) [0–15%]	0 (0%) [0–15%]	18 (100%) [85–100%]
Now that I have completed the Dip EM, I have the right skills and knowledge for EM	0 (0%) [0–15%]	0 (0%) [0–15%]	18 (100%) [85–100%]
Now that I have completed the Dip EM, I am confident to treat emergency patients in my hospital	0 (0%) [0–15%]	1 (6%) [0–28%]	17 (94%) [72–100%]
Ratings of Dip EM components			
Myanmar Emergency Medicine Introductory Course (MEMIC)			
The MEMIC improved my skills and knowledge	0 (0%) [0–15%]	1 (6%) [0–28%]	17 (94%) [72–100%]
The MEMIC improved my clinical practice	0 (0%) [0–15%]	1 (6%) [0–28%]	17 (94%) [72–100%]
The Surgical (Basic) Skills Course (ASSET)			
The ASSET improved my skills and knowledge	0 (0%) [0–15%]	1 (6%) [0–28%]	17 (94%) [72–100%]
The ASSET improved my clinical practice	0 (0%) [0–15%]	1 (6%) [0–28%]	17 (94%) [72–100%]
The Advanced Trauma Life Support Course (ATLS)			
The ATLS improved my skills and knowledge	0 (0%) [0–15%]	0 (0%) [0–15%]	18 (100%) [85–100%]
The ATLS improved my clinical practice	0 (0%) [0–15%]	0 (0%) [0–15%]	18 (100%) [85–100%]
The Emergency Life Support Course (ELS)			
The ELS improved my skills and knowledge	0 (0%) [0–15%]	0 (0%) [0–15%]	18 (100%) [85–100%]
The ELS improved my clinical practice	0 (0%) [0–15%]	0 (0%) [0–15%]	18 (100%) [85–100%]
The Major Incident Medical Management course (MIMMS)			
The MIMMS improved my skills and knowledge	0 (0%) [0–15%]	0 (0%) [0–15%]	18 (100%) [0–15%]
The MIMMS improved my clinical practice	0 (0%) [0–15%]	1 (6%) [0–28%]	17 (94%) [72–100%]
The Essential Pain Management Course (EPM)			
The EPM improved my skills and knowledge	0 (0%) [0–15%]	2 (11%) [2–34%]	16 (89%) [66–98%]
The EPM improved my clinical practice	0 (0%) [0–15%]	2 (11%) [2–34%]	16 (89%) [66–98%]
The Teaching on the Run course (TOTR)			
The TOTR improved my skills and knowledge	0 (0%) [0–15%]	0 (0%) [0–15%]	18 (100%) [85–100%]
The TOTR improved my clinical practice	0 (0%) [0–15%]	1 (6%) [0–28%]	17 (94%) [72–100%]

TABLE 2. *Continued*

Question	Disagree and Strongly Disagree <i>n</i> (%) [CI]	Unsure <i>n</i> (%) [CI]	Agree and Strongly Agree <i>n</i> (%) [CI]
The Advanced Paediatric Life Support course (APLS)			
The APLS improved my skills and knowledge	0 (0%) [0–15%]	0 (0%) [0–15%]	18 (100%) [85–100%]
The APLS improved my clinical practice	0 (0%) [0–15%]	0 (0%) [0–15%]	18 (100%) [85–100%]
The Alfred Trauma Team Training course (TTT)			
The TTT improved my skills and knowledge	0 (0%) [0–15%]	1 (6%) [0–28%]	17 (94%) [72–100%]
The TTT improved my clinical practice	0 (0%) [0–15%]	0 (0%) [0–15%]	18 (100%) [85–100%]
The Toxicology course (TOX)			
The TOX improved my skills and knowledge	0 (0%) [0–15%]	0 (0%) [0–15%]	18 (100%) [85–100%]
The TOX improved my clinical practice	0 (0%) [0–15%]	1 (6%) [0–28%]	17 (94%) [72–100%]
The Advanced Cardiac Life Support (Hong Kong) course (ACLS)			
The ACLS improved my skills and knowledge	0 (0%) [0–15%]	0 (0%) [0–15%]	18 (100%) [85–100%]
The ACLS improved my clinical practice	0 (0%) [0–15%]	0 (0%) [0–15%]	18 (100%) [85–100%]
The 2-week visit to Hong Kong (HK visit)			
The HK visit improved my skills and knowledge	0 (0%) [0–15%]	1 (6%) [0–28%]	17 (94%) [72–100%]
The HK visit improved my clinical practice	0 (0%) [0–15%]	3 (17%) [5–40%]	15 (83%) [60–95%]
The Clinical Specialty Rotations (Rotations)			
The Rotations improved my skills and knowledge	0 (0%) [0–15%]	5 (28%) [12–51%]	13 (72%) [49–88%]
The Rotations improved my clinical practice	1 (6%) [0–28%]	4 (22%) [8–46%]	13 (72%) [49–88%]
The YGH ED rotation and daily FACEM teaching (ED Rotations)			
The ED Rotations improved my skills and knowledge	0 (0%) [0–15%]	1 (6%) [0–28%]	17 (94%) [72–100%]
The ED Rotations improved my clinical practice	0 (0%) [0–15%]	1 (6%) [0–28%]	17 (94%) [72–100%]
The final exam and preparation (Exam) <i>n</i> = 17			
The Exam improved my skills and knowledge	0 (0%) [0–16%]	0 (0%) [0–16%]	17 (100%) [84–100%]
The Exam improved my clinical practice	0 (0%) [0–16%]	1 (6%) [0–29%]	16 (94%) [71–100%]

mark. The requirement for the EM18 to continue government service in their parent disciplines impeded effective learning and also impacted on the specialty rotations. Modifications for the second iteration of the Dip EM include incorporating specialty-specific learning objectives into the curriculum and allowing a full-time commitment.

Short courses are rated as enjoyable and useful, but may not change practice unless reinforced over following months.²¹ This Dip EM placed a heavy emphasis on short courses, with limited patient care experience. A challenge will be to retain the breadth of teaching covered through the many relevant short courses, while expanding rein-

forcement during regular clinical exposure.

The Dip EM was commenced when basic knowledge of EM among local stakeholders was low and prior to the establishment of EM structures such as formal hospital and university departments, and career pathways. Uncertainty about future employment remains an impediment to trainee re-

TABLE 3. *Qualitative feedback grouped into themes*

Question	Themes	Quotes
1. Can you please comment on what you think EM is?	Life-saving medicine Requires broad skills and knowledge in prevention, diagnosis and treatment An essential specialty that includes all other specialties Needed in Myanmar	'EM is the essential part of medical practice whatever the specialties you are. It is the lives saving medicine and it must know and practice all the medical personnel from different level and different specialties. The good emergency service in medicine is the image of the medical service of a country.'
2. Can you please comment on how your understanding of EM has changed (if at all) since you started the Dip EM?	EM is more than resuscitation Prioritise emergencies EM must be integrated with all care providers There needs to be flexibility for the local context	'Previously I think that EM is the speciality that concern mainly resuscitation only. Since I started the Dip EM, I gradually understand that EM is not only for resuscitation, it is a very important and essential speciality for the people because EM includes all the emergencies (medical, surgical, OG, paed, psych, trauma, pain, disaster management, teaching methodology, leadership management).' 'Marked changes happened. For a developing country our way to EM development is not like developed ones. Adaptions, modifications are essential parts of EM development. After Dip EM course, my understanding of EM is not European, American, not Australian, not France, but Myanmar EM.'
3. Free comments about clinical rotations to other specialties	Specific teaching programme/curriculum required Poorly organised/supervised	'Each speciality should have specific teaching programme for EM students and should give a chance for EM students in emergency skill training.' 'Some were not well organised.'
4. Free comments about the YGH ED rotation and daily teaching by FACEMs	Invaluable teaching by expert FACEMs EM systems should be in place (e.g. good ED design, protocols, communication systems, lines of authority and responsibility) The ED offers hands-on exposure to all aspects of EM	'We had faced some problems during the YGH ED rotation concerning responsibility, authority etc. We got invaluable experiences from daily teaching by FACEMs, especially case discussion and exam preparation.' 'It was very useful time of the whole Dip EM period. I learnt a lot from teaching, clinical practice, communication between departments and colleagues. The ED rotation is the best place for the rotation of medicine, surgery and orthopaedics.' 'Except for ED rotation, other rotations were not that much useful for EM. But clinical rotations could be useful by supervision of FACEMs on EM candidates because they know what EM is. Daily teaching of FACEMs was excellent. ED rotation could be improved by proper ED designs and organisation.'
6. Of the all the Dip EM, what was the most enjoyable part? most useful? most relevant?	Hong Kong visit Short courses Sense of achievement YGH ED rotation/FACEM supervision and teaching	'Hong Kong visit because at that time, we, EM went together and when we face with problem, solve together. Even some experiences we get in our country, but some were got from that visit.' 'Feeling of satisfaction and joy whenever I can save emergency patients using my knowledge and skill, getting from EM Diploma course.' 'ED teamwork, daily teaching with FACEMs. Practical management of patients at YGH ED with emergency physicians.' 'Learning about new skills and knowledge not only in clinical practice but also in leadership, teaching, communication; improved in spoken language; have a chance to have good teachers and friends from other part of the world.' 'Attend to courses were the most relevant part, among them the ELS course was the most relevant part because when sit for exam, we have to answer ELS approach.'
7. Has the Dip EM changed you or your practice in any way?	More confidence in treating patients Improved knowledge, skill, practice and systematic approach in emergencies New ways of thinking, communicating, leadership and teaching A new appreciation of medicine and total patient care	'I felt myself that I am more confident in treating patients with arrhythmias and performing airway skills. Moreover ways of thinking, finding out problems and approach to patient have all been changed a lot.' 'I strongly agree that the Dip EM has changed my practice. The systemic approach to all patients and improve the saving lives of the patient by having knowledge and skill from Dip EM.' 'It changed a lot. We save life with simple airway opening on road. We've seen role of patient centre care, early recognition of seriously ill patient and importance of pain management. We also know the new method of teaching.' 'Changed a lot: Total patient care and management; Teamwork, communication; Teaching and learning process; Decision-making, leadership.'
8. What role do you think you will have in EM in Myanmar into the future?	Being an emergency physician and clinical practice Leadership role and leading development of EM Teaching, sharing knowledge and skills Part-time support	'I will be EM physician, teacher and one of developer.' 'I want to be a leader in EM in Myanmar. I want to share my knowledge and skills to other junior colleagues and want to develop very efficient emergency department in YGH.' 'I will take the role of part-time EM training both theoretical and clinical practice.'
9. Free comments	Gratitude and thanks, appreciation of things learnt Need for ongoing advocacy and encouragement Ideas and some uncertainty for the future	'The development of emergency medicine and well established emergency department in our hospitals in Myanmar is our main aim and we all are so much thankful for your effort, care, support and help in warmly, friendly way. Thank you so much to all of our international teachers, for your invaluable teachings.' 'We should understand the obstacles of development which is usual as any other countries. Developing own system of EM with help of international support. Assertiveness, advocacy, job satisfaction, good relation with other departments, Ministry support, public support are critical. Clinical care alone cannot survive EM in Myanmar.'

cruitment. Time is required to build understanding of emergency care generally, and to allow for MoH formalisation of essential frameworks for clinical and academic practice. The SEA Games provided an incentive for the rapid roll-out of training and some development of principle referral hospital EDs. The next challenge is to continue the pace and direction of EM development without this impetus for change.

Sustainability and follow-on activities

The volunteer nature of support is not sustainable. The AVID positions are therefore crucial to future developments. These include a second iteration of the Dip EM already commenced (February 2014), a specialist Masters of Medical Sciences (MMedSc) EM degree and a Diploma of Emergency Nursing, both to commence in 2015.

The new EM specialists will become the teachers, trainers, advocates and leaders of EM development into the future, thereby addressing sustainability. They have already taught components of the second Dip EM and will receive specific training in mentoring and assessment in preparation for the MMedSc EM programme. Many are already PTC instructors and since 2012 all EM18 have devised and taught a simple ambulance skill course in several sites around Myanmar. A Myanmar Society of EM was launched under the auspices of the MMA in February 2014.

Impact at the local and national level

Emergency care capacity building is generally poorly understood or is seen within a framework of vertical disease-specific programmes or short course impacts.²² The MEMDP illustrates a long term undertaking to build skills and knowledge, change thinking and enhance leadership. Furthermore, change is now evolving at the hospital structure and health systems level. No satisfactory framework for measuring the effect of this activity yet exists,²³ so we have to rely on qualitative and observational reports.

At an institutional level, positive impacts on clinical service delivery, patient-centred and team-based emergency care and new educational methods has resulted in some improved patient outcomes. Other hospitals and medical universities are coming to view these changes as desirable for their own environments.

Emergency care delivery during the SEA Games, particularly in the newly established and equipped EDs of YGH and NPT, served to publically illustrate a more responsive and functional health system. This increases confidence in acute care and hospitals and raises community expectations of an integrated health system designed to reduce all-cause morbidity and mortality.²⁴

The Myanmar MoH vision is to bring in national systems of emergency care – to hospitals in key urban centres and teaching hospitals and then down to the district and township level. The vision is to not only train doctors and nurses as specialists, but also to expand basic EM training to junior doctors, GPs and health care providers operating in a national system for acute care.

Conclusion

The programme to train the first EM specialists in Myanmar was created and delivered in response to pressing health needs. Visionary local leaders worked alongside an international team to complete a training programme that was adaptive, flexible and modern, with limited resources. Systems of training for and delivery of patient-centred emergency care have been introduced to Myanmar with the aim of national expansion. This collaborative approach to capacity development in emergency care might serve as a model for other resource challenged environments.

Acknowledgements

The authors thank the (late) Rector U Than Cho and current Rector and staff at the UM1 for their support of this programme. We also acknowledge and thank the (former) Minister U Pe Thet Khin and Ministry of Health, the

Myanmar EM Development Committee and the Australian Ambassador to Myanmar, Ms Bronte Moules. Australian Volunteers for International Development, Dr Roseanne Skalicky-Klein and Nigel Klein provided crucial assistance towards the end of the Dip EM, and FACEMs Drs Michael Augello, Shona McIntyre and Antony Chenhall contributed their time generously. Thanks to all of the clinicians who have been involved in supporting this work, various donor institutions and to the formal international partners: ACEM, IFEM and RACS.

Author contributions

All authors conceived of the paper. GAP primarily wrote the paper with input from JHBK and CC. GAP performed the quantitative data analysis and GAP and CC performed the qualitative evaluation data analysis. All authors were involved in the critical revision of the paper for intellectual content and final approval before submission.

Competing interests

CC is a section editor for *Emergency Medicine Australasia*.

References

1. Australian Government. Department of Foreign Affairs and Trade. Burma country brief. [Cited 4 Apr 2014.] Available from URL: http://www.dfat.gov.au/geo/burma/burma_brief.html
2. Myanmar Ministry of Health. Health statistics. [Cited 2 Apr 2014.] Available from URL: <http://www.moh.gov.mm/file/HEALTH%20STATISTICS.pdf>
3. Myanmar Ministry of Health. Myanmar health statistics 2008–2009. [Cited 2 Apr 2014.] Available from URL: <http://www.moh.gov.mm>
4. United Nations Development Program. Human development indicators, country profiles: Myanmar. [Cited 2 Apr 2014.] Available from URL: <http://hdr.undp.org/en/countries/profiles/MMR>

5. International Federation of Emergency Medicine. Member organisations. [Cited 4 Apr 2014.] Available from URL: http://www.ifem.cc/About_IFEM/Membership1/IFEM_Member_Organisations1.aspx
6. WHO Violence and Injury Prevention Programme. Developing Pre-Hospital Trauma Care approach for South East Asia. Report of an Inter-country consultation 2003 (Myanmar representative Prof. Kyaw Myint Naing). [Cited 4 Apr 2014.] Available from URL: http://whqlibdoc.who.int/searo/2003/SEA_Injuries_4.pdf?ua=1
7. Hargarten S, Martin IBK, Hauswald M, Hirshon JM. Executive Summary: global health and emergency care – what do we need to know to address the burden of illness and injury? *Acad. Emerg. Med.* 2013; 20: 1213–5.
8. Primary Trauma Care Foundation. PTC in Myanmar. Course Report 2009. [Cited 4 Apr 2014.] Available from URL: <http://www.primarytraumacare.org/wp-content/uploads/2011/09/PTC-Course-Report-Myanmar-April-2009.pdf>
9. Phillips G. Primary Trauma Care; breaking new ground. *IEMSIG Newsl.* 2009; 5: 13–7.
10. Myanmar Ministry of Health. Health Service Delivery; Curative Services. [Cited 2 Apr 2014.] Available from URL: <http://www.moh.gov.mm/file/Curative%20Services.pdf>
11. Soe ZW, Oo M. Emergency Medicine: new specialty in Myanmar. *Myanmar Med. J.* 2012; 55: 36–40.
12. Htwe MM. Emergency Medicine Development in Myanmar: an update. *IEMSIG Newsl.* 2012; 8: 16–7.
13. Royal Australasian College of Surgeons. Surgeons International Award. Professor Zaw Wai Soe. [Cited 10 Sep 2014.] Available from URL: <http://www.surgeons.org/for-the-public/international-scholarships/surgeons-international-award-recipient/>
14. Phillips G. Myanmar emergency medicine introductory course – MEMIC June 2012. *IEMSIG Newsl.* 2012; 8: 13–4.
15. Hobgood C, Anantharaman V, Bandiera G *et al.* International Federation for Emergency Medicine model curriculum for emergency medicine specialists. *CJEM* 2011; 13: 109–21.
16. Australasian College for Emergency Medicine. Fellowship exam curriculum documents. [Cited 14 Jul 2014.] Available from URL: <https://www.acem.org.au/Education-Training/Specialist-Training-Assessment-and-Exams/Fellowship-Examination.aspx>
17. Clarke F. Emergency Medicine in Myanmar: an overview. *IEMSIG Newsl.* 2013; 9: 15–6.
18. Australian Government. Department of foreign affairs and trade. Australian Volunteers for International Development (AVID). [Cited 8 Apr 2014.] Available from URL: <http://www.australianaidvolunteers.gov.au>
19. Pa Pa. Myanmar: EM development at Yangon General Hospital – preparing for the South East Asian Games. *IEMSIG Newsl.* 2013; 9: 7–8.
20. Phillips G. Emergency Medicine in Myanmar: completion of the first post-graduate specialist training course. *IEMSIG Newsl.* 2013; 9: 5–6.
21. Mosley C, Dewhurst C, Molloy S, Shaw BN. What is the impact of structured resuscitation training on healthcare practitioners, their clients and the wider service? A BEME systematic review: BEME Guide No 20. *Med. Teach.* 2012; 34: e349–e385.
22. Razzak JA, Kellermann AL. Emergency medical care in developing countries: is it worthwhile? *Bull. World Health Organ.* 2002; 80: 900–5.
23. Hsia R, Razzak J, Tsai AC, Hirshon JM. Placing emergency care on the global agenda. *Ann. Emerg. Med.* 2010; 56: 142–9.
24. Hirshon JM, Risko N, Calvillo EJ *et al.* Health systems and services: the role of acute care. *Bull. World Health Organ.* 2013; 91: 386–8.