A problem-based learning resource in emergency medicine for medical students

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Abstract

Emergency medicine is a relatively new specialty area within medicine, however medical schools, students and standard setting bodies have recognised that learning emergency medicine is integral to the training of medical students. There are, however, significant problems with the delivery of emergency medicine teaching including low teacher numbers, severely limited teaching time and lack of suitable learning resources. This paper describes the process of development of a learning resource, its format and content and summarises student feedback.


Keywords: education; emergency medicine

Emergency medicine is a relatively new specialty area within medicine and, in comparison with other disciplines, the number of specialist emergency physicians is quite small. At the same time, medical schools, students and standard setting bodies, such as the Australian Medical Council1 and the Postgraduate Medical Council of New South Wales2 have recognised that learning the principles of emergency medicine is essential for medical students.

But there are problems with providing suitable teaching. High clinical loads and limited emergency physician numbers make time available for teaching short. Additionally, in most medical schools, the number of hours allocated to the teaching of emergency medicine are meagre.3–4 This serious mismatch between increasing demands for emergency medicine teaching and finite resources is compounded by the fact that many teaching programmes in the field have developed in an ad hoc manner without suitable learning resources. These problems are not isolated to Australasia. Evidence from the United Kingdom and USA suggests that they are grappling with similar issues.5–3

The aim of this project was to tackle some of these problems by developing a learning resource for use by students, either as the basis for tutorials or for independent learning.

Educational basis

The underlying philosophies of the study guide format are based upon sound educational principles. Research has shown that knowledge is better recalled in the context in which it was originally learned7–10 and that the application of new knowledge in activities such as discussion, answering questions and solving problems leads to better understanding and retention of knowledge.8–9 11–12 The strong focus of the study guide is on problem-based learning, student participation and the development of decision making skills. It was designed so that it could form the basis for interactive small group tutorials or be used by students for independent learning. Independent learning permits students to learn at their own pace, decide areas on which they needed to spend more time, develop research skills for learning, and develop the habit of self directed learning for their professional lives.

Content and style

Given the breadth of emergency medicine, definition of a core curriculum was difficult. Attempts to do so have been made by The Society of Teachers of Emergency Medicine (USA)13 The Society for Academic Emergency Medicine (USA)14 and The Australasian College for Emergency Medicine15 The 10 topics chosen for the initial study guide fell into three main groups: the relationship between

<table>
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<th>Table 1 Topic sections in the study guide</th>
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<tr>
<td>The emergency department, the community and the hospital</td>
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<td>Triage</td>
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<td>Abdominal pain</td>
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the emergency department (ED), the community and the hospital; common medical and surgical problems seen in EDs and problems for which emergency medicine has special expertise. A deliberate attempt was made not to overwhelm students with too much information, instead concentrating on relationships and the principles of common and important topics. The 10 topics chosen for the first edition are shown in table 1.

For each topic, a limited number of specific learning objectives are provided. They concentrate on the link between basic and clinical science and the principles of decision making and treatment in the ED. Sections were designed with the aim that the activities contained could be completed by students within 45 to 60 minutes.

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The main activity in the study guide is the use of realistic case scenarios, supported by a series of questions to bring out the major issues. Examples of problem scenarios are shown in figure 1. In addition, to provide variety and maintain interest, some novel activities were also included, such as crossword puzzles, diagrams for completion, multiple choice questions and extended matching items. These activities also served as exercises in reinforcement of learning. An example is shown in figure 2.

When used as the basis for tutorials, students were instructed to work through relevant sections before attending the tutorial so that tutorial time could be used for checking learning and discussion and reinforcement of important points.

Evolution
A formal process of evaluation of the first edition was conducted in 1995 by fourth and final year students of The Royal Melbourne Hospital-Western Hospital Clinical School. Feedback from students was very positive about format, content and usefulness in directing learning. Several suggestions were made for the inclusion of additional topic areas: these included diabetic ketoacidosis, cardiac emergencies, burns, cervical spine radiographs, environmental emergencies and fracture management. Activities that students found particularly useful were the case scenarios and
matching questions. Suggestions for improvement included the provision of answers to the MCQ and matching questions and the identification of suitable reference resources.

In response to student feedback, new sections on fractures, diabetic emergencies, burns, cardiac emergencies and environmental emergencies were added to the second edition of the study guide (table 1).

The second edition has been in use since 1997. In addition to the ED at Western Hospital, it has been used by other teaching EDs in Australia, Southern Africa and Asia. Further feedback from students and teachers has resulted in a third edition (released February 2000, copies available from the author on request) in which all sections have been revised and updated and sections on medicolegal aspects and obstetrics and gynaecology added (table 1).

Comment
The process of design of this learning resource was very challenging, partly because it is an

Figure 2  Example of learning activity.

Activity:
With your knowledge of anatomy and pathology, attempt to complete this diagram which gives a differential diagnosis of acute abdominal pain by location.

Thoracic causes:
1.
2.
3.
4.

Right upper quadrant:
1.
2.
3.
4.
5.

Left upper quadrant:
1.
2.
3.
4.
5.

Right lower quadrant:
1.
2.
3.
4.
5.
6.
7.
8.
9.

Left lower quadrant:
1.
2.
3.
4.
5.
6.
7.
8.
9.

Generalized or poorly localized pain:
1.
2.
3.
4.
5.
6.
7.

Metabolic/
Miscellaneous:
1.
2.
3.
4.
unusual form of “text” for medical students. The support from students, both for the study guide and the process of preparation for tutorials, has continued to be strong. The study guide has also proved to be flexible, working equally well for fourth and final year students and for different lengths of ED attachment.

This style of learning resource would lend itself well to an interactive computer and web-based program, which would allow more interactive activities. It is hoped that this adaptation will be possible in the not too distant future.

Conclusion
The development of this problem-based study guide has been a unique and innovative attempt to match students’ need and keenness to learn emergency medicine, the resource limitations of modern EDs and sound educational principles.

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