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ORIGINAL ARTICLE

Early clinical exposure in medical curricula across Europe: An overview

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Abstract

Background: Many faculties of medicine now include programmes using early clinical exposure (ECE) to introduce medical students to important topics in medicine. **Objective:** To sketch the landscape of ECE in Europe, describing existing courses. **Methods:** A survey questionnaire was developed by the Basic Medical Education Committee of the European Academy of Teachers in General Practice (EURACT). This survey used the key informant interviews method, with EURACT Council members serving as key informants by filling in the questionnaire and gathering descriptive data on ECE programmes in their own countries. **Results:** We asked representatives of 32 EURACT member countries to complete the questionnaire in 2006. We received responses from 21 countries, and the programmes of 40 medical schools from 16 countries were included in the study. Thirty-two medical schools implemented ECE starting in the first year. The duration of ECE programmes ranged from 2 weeks to 2 years. The length of each session varied from 2 hours to a full day. Primary care played an important role in ECE. ECE programmes were implemented with a wide range of objectives.

Conclusion: ECE is a new and rewarding trend in European medical schools, and general practice/family medicine (GP/FM) departments are widely involved in these teaching activities. This could help establish GP/FM departments in some countries that still do not have them in their medical schools.

Key words: *Early clinical exposure, medical curricula, Europe*

Introduction

Becoming a doctor is a complex process, and the early years of medical education can have an important influence on this process. The profile of a doctor combines different competencies. Flexner defined the importance of the scientific approach, Engel proposed the biopsychosocial model, and CanMeds has listed the different professional roles of the doctor. We know what students need to learn, but we still need to agree on how to organize the learning environment (1).

From the literature on the psychology of learning, research has shown that there is no content-

independent problem-solving process (2), and practical experience is a prerequisite for developing medical expertise (3). The problem-solving strategy utilized is dependent on the knowledge structure available to the clinician, and this knowledge structure depends on the context in which the problem has appeared and has to be solved (4). This means that the more problems students encounter in different settings, the more skills of clinical problem solving they will gain.

This theoretical background requires an emphasis on early clinical exposure (ECE) and community-based teaching (5). Many medical

schools throughout the world are vertically integrating various types of practical experience into the early years of their curriculum in order to introduce medical students to important topics in medicine (5–13).

In the literature on early clinical exposure, there are a great variety of activities described based on a very broad definition. The terms used to define the concept of gaining early practical experience are also rather different and include early patient experience, early patient contact (10,14,15), early integrated patient contact (15), early clinical exposure (16,17), early clinical experience (7,11), early practical experience (13,18), early clinical contact (12,19), learning from early experience (1), early student–patient contact (13), and early patient encounter (20). Although there is no consensus on the definition of ECE in the literature, it can be defined as an “authentic human contact in a social or clinical context that enhances learning of health, illness and/or disease, and the role of the health professional”, occurring in the early or preclinical years of undergraduate education (21).

The evidence base in support of this approach is growing (18). Our knowledge of the effects of ECE programmes on basic medical education has increased recently. In a systematic review, Dornan et al. identified published empirical evidence of the effects of early experience in medical education. The search yielded a total of 73 studies and 277 educational outcomes. There appears to be wide variation in the timing, duration, teaching methods, and content of these programmes. Early experience is usually compulsory, in the community, and in the first 2 years of the curriculum. It usually consists of a supervised clinical placement, and sometimes direct exposure to patients, their families, and the community (6).

ECE facilitates integration of basic and clinical sciences, improves students’ attitudes towards basic sciences, and provides insight into the psychosocial aspects of medical care (6,22). Early experience seems to foster appropriate professional attitudes among students (6,9,15). It can help learners acquire communication and basic clinical skills, it contextualizes students’ learning, makes students more satisfied with their curriculum, and reduces the stress of meeting patients. ECE also has potential benefits for teachers, healthcare organizations, patients, and populations (6). As a result, “early clinical experiences have positive effects on affective and cognitive outcomes and knowledge and skill development” (13).

A study of early clinical exposure in basic medical education in Europe was undertaken by the European Academy of Teachers in General Practice

(EURACT). EURACT is the educational network organization of the WONCA Region Europe/European Society of General Practice/Family Medicine. The aim of the academy is to foster and maintain high standards of care in European general practice by promoting learning and teaching in general practice/family medicine. The Basic Medical Education Committee is one of the permanent groups within the EURACT Council and is primarily concerned with the undergraduate teaching of family medicine at universities (23). The committee has taken an interest in ECE in basic medical education.

The aims of this study were to learn more about ECE programmes in medical schools throughout Europe, to define their educational goals, structure, and content, and to explore the methods used in different settings.

Methods

This survey used the key informant interviews method to provide descriptive data. This method collects data from a selected number of informants familiar with a topic in order to obtain as broad a range of responses as possible. It is not intended to provide data on the prevalence of a phenomenon, as is done in random sampling surveys.

Questionnaire development

A survey questionnaire was developed by the Basic Medical Education Committee of EURACT. We used a small-group discussion approach to develop a draft questionnaire. After an initial survey of the literature on ECE by one of the committee members (O.B.), the topic was discussed in one of the sessions of the Basic Medical Education Committee, which included council members from 11 countries. Based on the group discussion and the literature survey, the first version of the questionnaire was prepared (W.S.). We tested the questionnaire for preface validity among the Basic Medical Education Committee members and in three medical schools. Using feedback from these respondents, a modified version of the questionnaire was created and presented to the plenum of the EURACT Council consisting of national representatives from 32 EURACT member countries. After suggestions from the council, a final version of the “EURACT 15-Item Questionnaire on ECE” was formulated in 2006.

The questionnaire consisted of questions on ECE programmes in different countries, their educational goals, structure, and content, and evidence of their educational value.

Participants

We interviewed EURACT Council members, who are primary care physicians actively involved in teaching at the undergraduate or graduate level, to serve as key informants by completing the questionnaire and gathering information on ECE programmes in their own countries. In those cases where key informants were not in a position to provide the required information, they were asked to collect the data from informants at their respective medical schools. Electronic mail was used to collect some responses. In a few cases, participants were interviewed directly during EURACT Council meetings.

For analysis, the data were transferred from questionnaires to an electronic spreadsheet. Data were analyzed by one author (J.Y.), and the results were re-validated by another author (O.B.). Categories were developed from the data; there were no preformed categories. Simple frequencies of the structure, objectives, and methods of ECE programmes were calculated.

Results

We asked representatives of 32 EURACT member countries to complete the questionnaire in 2006. Twenty-one representatives responded, with no response from 11 countries. Because questionnaires from five countries contained insufficient or inadequate information on ECE, they were not analysed. We received responses from 45 medical schools in 16 countries. Of the 45 medical schools represented, there was insufficient information from three schools. The programmes in two schools were not judged to be ECE according to the study definition. As a result, the programmes of 40 medical schools were included in the study.

Thirty-two medical schools (80.0%) implemented ECE starting in the first year. Almost all of them (31 schools) had patient contact by the end of the first semester. The duration of ECE programmes ranged from 2 weeks to 2 years. Sixteen programmes had more than 20 sessions of ECE, and 14 did not provide details of the number of sessions in the programme. The length of each session varied from 2 hours to a full day. Most programmes took place in primary care, general practice, or family medicine department outpatient clinics (35 schools). In almost all countries, ECE programmes were implemented with a wide range of objectives. Orientations to several aspects of medical practice (23 schools) and introduction to clinical skills including history taking and physical examination skills (15 schools)

were the most prominent elements of the programmes. Several educational methods were used.

The main objectives of the various ECE programmes, place of training, duration, length, and number of sessions, time in undergraduate medical education programme, and teaching methods are given in Table I. The main objectives, teaching methods, and place of training for ECE according to country are also described in Table II.

Methods of evaluation of ECE programmes were student feedback, and internal and external audits. Only a few ECE programmes have been described in publications in the medical literature. A list of these 19 publications is provided in Table III.

Discussion

Introducing students to clinical medicine early in their studies using real clinical situations has been advocated to make teaching more practical, relevant, and stimulating, and to reinforce the vertical integration between basic medical and clinical sciences (8,30). It helps students to apply theoretical knowledge to real patient problems when making the transition from preclinical to clinical training (20,31,32) and thus offers valuable preparation for clerkships (13). In the 1993 recommendations of the UK General Medical Council (GMC) for undergraduate medical education and those of the National Agency for Higher Education in Sweden in 1997, early patient contact was accompanied by an increased contribution to teaching by GPs (10,30). Haffling et al. defined the features of early patient contact as more teaching from a community base, changing the setting from that of a hospital to general practice, in the first part of the curriculum. The main aim was to offer students opportunities to learn communication and examination skills (10). Furthermore, a World Federation of Medical Education statement emphasized that “students should meet patients early on” (33).

This overview paper has aimed to sketch the landscape of ECE in Europe, describing existing courses. We did not intend to estimate the prevalence of ECE programmes in European medical schools. Our results show that ECE is used in basic medical education in Europe with a variety of objectives, teaching methods, and assessment methods. Primary care plays an important role in ECE.

Our survey showed substantial ECE activities in 16 of the 32 European countries represented in EURACT. ECE programmes were widely implemented in all or almost all medical schools in five European countries (Estonia, Romania, Malta, the Netherlands, and the UK). Our survey revealed ECE programmes were used in almost all

Table I. ECE programme characteristics.

	Categories	No. of programmes
Main objectives	1. Orientation to several aspects of medical practice	23
	2. Introduction to clinical skills (history taking, physical examination)	15
	3. Learning communication skills	11
	4. Learning patients' perspectives	7
	5. Learning several aspects of professionalism	6
	6. Orientation to national health services	5
	7. Understanding health and disease	5
	8. Orientation to community	3
	9. Integrating science and clinical learning – visualize anatomy	2
	10. Inspiring students	2
Place of training	1. Primary care settings, general practice clinics, department outpatient clinics	35
	2. Hospital wards and/or outpatient clinics	19
	3. Community, patients' homes	3
Duration	1. Under 4 weeks	7
	2. Five weeks to 1 year	7
	3. More than 1 year	13
	4. Not mentioned	13
Length of session	1. One day (6–8 hours)	15
	2. Half day (4 hours)	5
	3. Less than half day (2–3 hours)	10
	4. Not mentioned	10
Number of sessions	1. 20 sessions and above	16
	2. 10 to 19 sessions	4
	3. 5 to 9 sessions	3
	4. Fewer than 5 sessions	3
	5. Not mentioned	14
Time in programme	1. First semester	31
	2. Second semester	1
	3. Second year	5
	4. Third year	3
Teaching methods	1. Observation	21
	2. Small group teaching methods	18
	3. Clinical teaching methods (bedside teaching, learning by doing, reflection, demonstration, coaching)	17
	4. Feedback	10
	5. Written reflections, reporting, assignments, presentations	9
	6. Self learning, videotaping	7
	7. Case based learning (PBL like methods)	6
	8. Lectures and mini lectures	3

north-western European countries (the UK, Ireland, Denmark, Sweden, Norway, Finland, and the Netherlands). There were very few ECE programmes in the central and eastern European countries surveyed—countries that are generally experiencing a period of transition in their healthcare systems.

We collected insufficient data from five countries. Although the questionnaire was circulated to all 32 national representatives within EURACT, the survey yielded a response rate of 65.6%. In addition to five countries giving insufficient data, non-participating countries were likely to be those without GP/FM departments in their medical schools (e.g., Italy and

Greece) or those not having ECE programmes in their undergraduate curricula.

There are probably many more examples of ECE programmes in Europe in addition to those described here. Dornan et al. reported a total of 73 ECE programmes from several countries throughout the world (5). Nearly all medical schools in the Netherlands offer early clinical experience (34), and all UK medical schools are now using real patients in the teaching of medicine from the earliest stages (35).

There are some limitations to this survey. Firstly, study participants were national representatives of

Table II. Main objectives, teaching methods, and place of training of ECE according to country.

Country (number of programmes included)	Main objectives	Teaching methods	Place of training
United Kingdom (8)	1, 2, 3, 4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 7, 8	1, 2, 3
Romania (7)	6	1	1
Sweden (4)	2, 3, 4, 5, 6, 7	1, 2, 3, 5, 6, 8	1, 2
The Netherlands (3)	1, 2, 3, 6	1, 3, 4, 5, 6	1, 2
Turkey (3)	1, 2, 3, 5, 6	1, 2, 3, 5	1, 3
Spain (3)	2, 4, 6	?	1, 2
Austria (2)	2, 5, 10	1, 2, 3	1, 2
Norway (2)	2, 3, 5	1, 3	1, 2
Denmark (1)	2, 10	3	2
Estonia (1)	1, 2	1, 2, 5	1
Finland (1)	3, 6	1, 3, 4, 5	1
Ireland (1)	1, 2, 4, 5, 7, 8	2, 3, 7	1, 3
Israel (1)	2, 3, 4, 5, 7	2, 3, 4, 6	?
Malta (1)	9	1	1, 2
Portugal (1)	5, 6, 7	3, 5, 6, 7	1
Serbia (1)	1, 2	2, 5	1, 2

Category numbers are defined in Table I.

the EURACT Council, and not representatives of medical schools in their countries. This could have led to recall bias, especially for countries with many medical schools. The interpretations of the national representatives of EURACT, used as key informants, are subjective. However, when necessary, additional answers from other informants or department chairs from their countries were obtained. We therefore believe that this helped to ensure that ECE activities were identified adequately.

Secondly, both study participants and those implementing the survey were all general practitioners. This should be taken into consideration in interpreting the data collected. However, general practices are extensively involved in early patient contact (36). In Dornan et al.'s systematic review, primary care settings were reported as the settings most often used (6). Our results are similar to those in other studies, so we can assume that the use of GPs as informants is not a limitation.

Problems of definition

There are two apparent difficulties with the current definition of early clinical exposure. Firstly, it might be difficult to include a teaching activity with simulated patients as an authentic clinical experience. Secondly, settings for ECE are highly varied. Patient (or person) exposure can be experienced in different settings, from community facilities and private homes to primary care clinics, hospital outpatient clinics (for FM or other specialities), and hospital wards. If there is real contact with healthy or sick people in any of these settings, it should be deemed as clinical exposure. If this occurs during the first years of medical education in which students learn basic sciences, this may be considered early exposure. If the programme uses simulated patients or students, even in a community setting or people's homes, then it is not clinical exposure. We therefore excluded programmes involving only

Table III. List of publications on ECE.

Medical school	Country	No. of published articles (reference no.)	Others (in national journals or presentations)	Total
Linköping	Sweden	3 (24–26)	3	6
Göteborg	Sweden	—	2 (27)	2
Aydın	Turkey	—	2	2
Lund	Sweden	1 (10)	—	1
Tel Aviv	Israel	1 (16)	—	1
Maastricht	the Netherlands	2 (13,20)	—	2
Utrecht	the Netherlands	1 (28)	—	1
Turku	Finland	—	1	1
Norfolk	UK	1 (14)	—	1
Nottingham	UK	1 (11)	—	1
Aarhus	Denmark	—	1 (29)	1
Total		10	9	19

simulated activities in skills labs or other parts of the medical school, such as classrooms. However, lectures or mini-lectures, and small group discussions on clinical experiences, might be a part of a programme that also includes real patient experience.

Our definition of ECE has three main aspects: 1) exposure to real patients or healthy people, 2) in community or clinical settings, and 3) occurring before the main clinical rotations. Because of problems in understanding the definition of ECE, some examples of ECE courses included elements of our definition of ECE in addition to elements not related to ECE. Although we excluded programmes not judged to be ECE from the study, some of the 40 programmes analysed in the survey contained elements such as clinical activities in a skills lab or other departments of the medical schools using simulated patients or students as patients.

There is no consensus on the definition of ECE in the medical literature. Dornan et al. appear to have made the only attempt at formulating a complete definition (21). Other articles giving examples of ECE activities have not been interested in formulating the definition. McLean et al. emphasized the need to provide students with an insight into the real world of medicine (8). Lie et al. described the most common learning themes of ECE programmes (7). In another study, ECE was described in terms of providing students with one-to-one teaching regarding their early visits to general practice (11). Miettola et al. defined it as the opportunity for students to meet patients in a real primary healthcare setting during the early stages of their studies (36). Abramovitch et al. emphasized that ECE has to be differentiated from early exposure to clinical skills in school settings in the early years of medical training (16). Early clerkships in internal medicine and surgery in the third year of the curriculum have also been called ECE (28), and early patient encounters are undertaken in the third year of the teaching outpatient clinic at University Hospital Maastricht (20).

Although none of these studies has formulated a complete definition of ECE, researchers are keen to accept Dornan et al.'s definition as the basis for their studies on early clinical experience. In a recent article, however, Ottenheim et al. emphasized how to construct an effective learning environment for early clinical experience in real practice. In connection with the development of a new Maastricht undergraduate curriculum, they defined several criteria for effective clinical teaching and learning, based on a search of the literature. These criteria were translated into six starting points: continuing

exposure to patients, transformation of experience into knowledge, active role of students, supervision and feedback, time and space for teaching, and teacher training. In conclusion, they suggested that ECE activities should be well planned, with clear learning goals and tutorial sessions (13).

Conclusion

ECE has been proposed as a method for teaching medical students, and is used in basic medical education in many countries in Europe, with a variety of objectives, teaching methods, and assessment methods. Primary care plays an important role in ECE. ECE programmes are used in almost all north-western European countries. In a few countries, all or almost all medical schools have ECE activities in their undergraduate curricula.

ECE is a new and rewarding trend in European medical schools, and GP/FM departments are widely involved in these teaching activities. This could help establish GP/FM departments in some countries that still do not have them in their medical schools.

There are common threads regarding the knowledge, skills, and attitudes required of medical students and the value of ECE. We need to share our expertise across Europe. Further work needs to be done regarding the definition of ECE and the evaluation of the impact of ECE on the training of medical students.

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References

1. Dornan T, Bundy C. What can experience add to early medical education? Consensus survey. *BMJ* 2004;329:834-9.
2. Elstein AS, Shulman LS, Sprafka SA. Medical problem solving: an analysis of clinical reasoning. Cambridge, MA: Harvard University Press; 1978.
3. Schmidt HG, Norman GR, Boshuizen HPA. A cognitive perspective on medical expertise: theory and implications. *Acad Med* 1990;65:611-21.
4. Coderre S, Mandin H, Parasym PH, Fick GH. Diagnostic reasoning strategies and diagnostic success. *Med Educ* 2003; 37:695-703.

5. Hannay D, Mitchell C, Chung MC. The development and evaluation of a community attachment scheme for first-year medical students. *Med Teach* 2003;25:161–6.
6. Dornan T, Littlewood S, Margolis SA, Scherpbier A, Spencer J, Ypinazar V. How can experience in clinical and community settings contribute to early medical education? A BEME systematic review. *Med Teach* 2006;28:3–18.
7. Lie D, Boker J, Gutierrez D, Prislun M. What do medical students learn from early clinical experience (ECE)? *Med Teach* 2006;28:479–82.
8. McLean M. Sometimes we do get it right! Early clinical contact is a rewarding experience. *Educ Health (Abingdon)* 2004;17:42–52.
9. Lam TP, Irwin M, Chow LWC, Chan P. Early introduction of clinical skills teaching in a medical curriculum – factors affecting students’ learning. *Med Educ* 2002;36:233–40.
10. Haffling AC, Hakansson A, Hagander B. Early patient contact in primary care: a new challenge. *Med Educ* 2001;35:901–8.
11. Hampshire AJ. Providing early clinical experience in primary care. *Med Educ* 1998;32:495–501.
12. Forster DP, Drinkwater CK, Corradine A, Cowley K. The family study: a model for integrating the individual and community perspective in medical education. *Med Educ* 1992;26:110–5.
13. Ottenheim RPG, Zwietering PJ, Scherpbier AJJA, Metsemakers JFM. Early student-patient contacts in general practice: an approach based on educational principles. *Med Teach* 2008;30(8):802–8.
14. Vieira JE, Nunes MPT, Martins MA. Directing student response to early patient contact by questionnaire. *Med Educ* 2003;37:119–25.
15. Howe A, Daglet V, Hopayian K, Lillicrap M. Patient contact in the first year of basic medical training—feasible, educational, acceptable? *Med Teach* 2007;29:237–45.
16. Abramovitch H, Shenkman L, Schlank E, Shoham S, Borkan J. A tale of two exposures: a comparison of two approaches to early clinical exposure. *Educ Health (Abingdon)* 2002;15:386–90.
17. Rani MA, Sharma KS, Koirala S. What do students say about the early clinical exposure at B.P. Koirala Institute of Health Sciences, Nepal? *Med Teach* 2002;24:652–4.
18. Littlewood S, Ypinazar V, Margolis SA, Scherpbier A, Spencer J, Dornan T. Early practical experience and the social responsiveness of clinical education: systematic review. *BMJ* 2005;331:387–91.
19. Wilkinson TJ, Gower S, Sainsbury S. The earlier, the better: the effect of early community contact on the attitudes of medical students to older people. *Med Educ* 2002;36:540–2.
20. Diemers AD, Dolmans DHJM, Van Santen M, Van Luijk SJ, Janssen-Noordman AM, Scherpbier AJ. Students’ perceptions of early patient encounters in a PBL curriculum: a first evaluation of the Maastricht experience. *Med Teach* 2007;29:135–42.
21. Dornan T. Osler, Flexner, apprenticeship, and ‘the new medical education’. *J R Soc Med* 2005;98:91–5.
22. Duban S, Mennin S, Waterman R, Lucero S, Stubbs A, Vanderwagen C, et al. Teaching clinical skills to pre-clinical medical students: integration with basic science learning. *Med Educ* 1982;16:183–7.
23. EURACT, URL: <http://www.euract.org/html/pdf/booklet2004.pdf> (accessed in 26 July 2008)
24. Foldevi M, Sommansson G, Trelle E. Problem-based medical education in general practice: experience from Linköping, Sweden. *Br J Gen Pract* 1994;44:473–6.
25. Brynhildsen J, Dahle LO, Behrbohm Fallsberg M, Rundquist I, Hammar M. Attitudes among students and teachers on vertical integration between clinical medicine and basic science within a problem-based undergraduate medical curriculum. *Med Teach* 2002;24:286–8.
26. Dahle LO, Brynhildsen J, Behrbohm Fallsberg M, Rundquist I, Hammar M. Pros and cons of vertical integration between clinical medicine and basic science within a problem-based undergraduate medical curriculum: examples and experiences from Linköping, Sweden. *Med Teach* 2002;24:280–5.
27. Hellquist G, Rödger S, von Below B, Sveinsdóttir G, Björkelund C. Early Professional contact supports professional development of medical students. EPC – a new course in medical education in Gothenburg. *Lakartidningen* 2005;102:2646–8, 2650–1 [in Swedish].
28. Kamalski DMA, Ter Braak EWMT, Ten Cate OTJ, Borleffs JCC. Early clerkships. *Med Teach* 2007;29:915–20.
29. Eika B, Molgaard H, Sone O, Jorgensen JO. [Early clinical exposure—an instant success. The new medical curriculum at the University of Aarhus]. *Ugeskr Laeger* 2001;163:3626–9 [in Danish].
30. General Medical Council. *Tomorrow’s doctors: recommendations on undergraduate medical education*. London: General Medical Council; 1993.
31. Prince KJAH, Van der Wiel M, Scherpbier AJJA, Van der Vleuten CPM, Boshuizen HPA. A qualitative analysis of the transition from theory to practice in undergraduate training in a PBL medical school. *Adv Health Sciences Educ* 2000;5:105–16.
32. Prince KJAH, Boshuizen HPA, Van der Vleuten CPM, Scherpbier AJJA. Students’ opinions about their preparations for clinical practice. *Med Educ* 2005;39:704–12.
33. World Federation for Medical Education. *International standards in medical education: assessment and accreditation of medical schools’ educational programmes*. *Med Educ* 1998;32:549–58.
34. Cate OT. Medical education in the Netherlands. *Med Teach* 2007;29:752–7.
35. Hopayian K, Howe A, Dagley V. A survey of UK medical schools’ arrangements for early patient contact. *Med Teach* 2007;29:806–13.
36. Miettola J, Mantyselka P, Vaskilampi T. Doctor-patient interaction in Finnish primary health care as perceived by first year medical students. *BMC Med Educ* 2005;5:34.