

The early years

Child development in undergraduate medical school training

Linda Comley MD CCFP FCFP Magdalena Janus PhD Denise Marshall MD CCFP FCFP Alison Niccols PhD

ABSTRACT

PROBLEM ADDRESSED There are substantial gaps in knowledge about early child development among graduating family physicians.

OBJECTIVE OF PROGRAM The main objective of this program was to develop, implement, and evaluate an early child development curriculum for undergraduate medical clerks doing their family medicine rotations.

PROGRAM DESCRIPTION The Early Years Program at McMaster University in Hamilton, Ont, consists of 2 small group sessions during the family medicine rotation and a site visit to a community agency that provides services to families with young children. The curriculum is delivered by interprofessional facilitator dyads: a family physician and another professional. The content covers areas such as newborn assessment, developmental screening and referrals, parenting issues, pregnancy, preconception, and prevention, and is supported by case studies, videos, and community resources.

CONCLUSION Based on casual feedback and formal evaluations, we conclude that the overall goal of launching the Early Years Program—to address previously identified gaps—has been achieved. We continue to improve the program to meet the challenges of the ever changing undergraduate health science education.

RÉSUMÉ

PROBLÈME À L'ÉTUDE Lorsqu'ils obtiennent leur licence, les médecins de famille ont une connaissance incomplète du développement précoce de l'enfant.

OBJECTIF DU PROGRAMME Le principal objectif du programme était d'élaborer, de mettre en œuvre et d'évaluer des cours sur le développement précoce de l'enfant à l'intention des étudiants en médecine de premier cycle effectuant leurs stages de médecine familiale.

DESCRIPTION DU PROGRAMME Le Programme des premières années à l'Université McMaster de Hamilton, en Ontario, est composé de 2 sessions en petits groupes durant les stages de médecine familiale et d'une visite à une agence qui offre des services à des familles avec jeunes enfants. Le cours est donné par des dyades de moniteurs comprenant un médecin de famille et un autre professionnel. Il couvre des domaines comme l'évaluation du nouveau-né, la surveillance du développement et les demandes de consultation, les questions relatives à l'éducation, la grossesse, la préconception et la prévention; il est enrichi par des études de cas, des vidéos et des ressources communautaires.

CONCLUSION Des commentaires anecdotiques et une évaluation formelle nous permettent de conclure que le but général de l'instauration du Programme des premières années – combler des déficiences préalablement identifiées – avait été atteint. Nous continuons d'améliorer le programme pour répondre aux défis en constante évolution de la formation de premier cycle en sciences de la santé.

*Full text is available in English at www.cfp.ca

This article has been peer reviewed.

Cet article a fait l'objet d'une révision par des pairs.

Can Fam Physician 2008;54:876.e1-4

The first 6 years of life are crucial in that they are the foundation upon which future development is based. An appreciation of the implications of early development is important for all future physicians, particularly primary care physicians.¹ *The Early Years Study: Reversing the Real Brain Drain*^{2,3} emphasized the need for enhanced education and collaboration among all sectors involved in early child development. This report spawned many initiatives among government and professional bodies; in Ontario, provincial government funding was expanded to improve many early childhood services⁴ and to create new supports for young children through Ontario Early Years Centres.

Primary care providers play a pivotal role in early childhood development, especially as a key access point for children and parents.⁵ Yet physician surveys show that graduating family medicine residents and practising family doctors feel ill-equipped to play such a role, owing to a lack of comprehensive training in common developmental issues of young children, and that they are not aware of community services.⁶ In response, the Department of Family Medicine at McMaster University in Hamilton, Ont, conducted an informal survey to assess potential gaps in the undergraduate early childhood development curriculum at the Michael G. DeGroote School of Medicine. Substantial gaps were identified in areas such as neurodevelopment, typical early developmental milestones, parenting, and behavioural issues. As a result, the Department of Family Medicine developed, implemented, and evaluated an early child development curriculum for undergraduate medical clerks doing their family medicine rotations.

While some universities offer undergraduate medical courses on pediatric⁷ or family issues,⁸ and there are some publications on undergraduate medical programs on specific child health issues,⁹ learning disabilities,¹⁰ and multidisciplinary school-based health centres,¹¹ no other information on programs focused on the early years was available.

Objectives of the program

The Early Years Program at McMaster has 3 objectives. The first is to provide family medicine clerks with

Dr Comley is a family physician (retired) in a rural-based medicine group practice in the Niagara region of Ontario and Faculty Coordinator for the Early Years Program in the Department of Family Medicine at McMaster University in Hamilton, Ont. **Dr Janus** is an Assistant Professor in the Department of Psychiatry and Behavioural Neuroscience at McMaster University. **Dr Marshall** is an Associate Professor and Assistant Dean of Faculty Development in the Faculty of Health Sciences at McMaster University. **Dr Niccols** is an Associate Professor at McMaster University and Director of the Infant-Parent Program at McMaster Children's Hospital.

knowledge of early child neurodevelopment from pre-conception to preschool age, with an emphasis on the interaction between "nature" and "nurture." Faculty and students discuss environmental, social, and biological factors that might positively or negatively affect development, as well as concepts such as attachment, parenting style, and parent-child interaction. The second objective is for students to use this knowledge as they examine the role of the physician in assessing development, identifying risks to development, and initiating early intervention in a primary care context. The third objective is to expose the students to professionals who interact with young children and families in community settings, to foster understanding of the various roles of early childhood professionals and their relationships with children and parents.

Program development

Curriculum materials were derived from teaching materials developed in 2000 by the Ontario College of Family Physicians peer presenter program, "Healthy Child Development," and adapted with the help of other professional experts. In December 2002, the Department of Family Medicine developed an Early Years Steering Committee, with representation from family medicine, child psychiatry, developmental pediatrics, nursing, public health, infant development, and early childhood research, to assist in launching the program. This committee continues to direct and evaluate further development of the program, and to recruit and train facilitators to deliver the program to the medical students. Since 2003, the curriculum has been delivered by interprofessional facilitator dyads: a family physician and one other professional (eg, nurse, child psychiatrist, infant-parent therapist, or developmental pediatrician). The initial curriculum was presented to 6 groups of 10 to 12 students, representing approximately two-thirds of the medical class (N=100) during the 2002 academic year. An important component of the program has been a site visit to a community agency involved in assessment or provision of services to families with children 0 to 6 years old (eg, Ontario Early Years Centres, communication clinics, home visits with an infant-parent therapist). Program evaluations by students have provided important feedback and stimulated program revision, especially during the pilot year.

Program outline

The curriculum teaching model is based on the McMaster University small group learning format. During most of their rotations, including the 6-week family medicine rotation, the clinical clerks gather for weekly tutorials in groups of approximately 10. The Early Years Program consists of 2, 3-hour small group sessions, 3 weeks apart, set during the family medicine rotation. Each student visits an early years site sometime between the 2

sessions, and all students discuss their experiences at the second sessions.

At the beginning of the family medicine rotation, the clerk receives an early years package, which contains the printed objectives of the program, an "Improving the Odds: Healthy Child Development" manual¹² (based on an earlier work by Comley¹³), and instructions and contact information for the site visit. A roster of sites in the community is arranged so that there are 1 or 2 students at each site. The students write brief reflective reports about their site visits.

Before the first session, the students are expected to acquire understanding of the program by reading the introductory chapters in the manual. At the beginning of the first session, the students are polled about their own background experiences. The session proceeds with a discussion of newborn assessment (physical and neurologic examination, illustrated by short video clips), medical screening, and early parenting issues, including infant attachment (also illustrated with video clips). A case report illustrates the issues discussed and leads to information sharing of related community resources. The rest of the session focuses on the well-baby checkup, including goals, tools (such as the Rourke Baby Record¹⁴), and developmental screening, with case studies and video clips illustrating typical development, developmental delay, motor development, speech delay, and autism spectrum disorder. The session ends with a review of expectations regarding the site visit and an invitation for students to share relevant cases from their family practice placements at the next session.

The second session opens with a discussion of the students' site visits and methods for finding resources in other communities. Parenting, parenting style, and toddler-behaviour issues are discussed and illustrated with video clips. The rest of the session is devoted to examining pre-conception and pregnancy, in order to consider how those preventive measures relating to child development can be built into primary care practice. The Antenatal Psychosocial Health Assessment (ALPHA) provides a template for discussion of psychosocial factors during pregnancy.^{15,16} Case studies and videos stimulate discussion of their psychosocial risk factors assessment in family practice, and the use of community resources is discussed. Students are referred to their resource packages for more detailed information, websites, and references.

Faculty development

In order to deliver the curriculum, a pool of faculty facilitators is required, as there are 8 to 12 groups of medical clerks placed in the mandatory family medicine rotation over the course of a year. Full-time and part-time faculty members responded to a recruitment call; they attended a faculty development workshop, received the curriculum material, and attended at least 1 student program before facilitating a session with an experienced

cofacilitator. A facilitator manual was developed, consisting of an outline of the program and teaching resources such as PowerPoint presentations, a list of videos, and a cache of cases for discussion. In total, 10 physician facilitators have been trained, enabling delivery of the curriculum and adequate distribution of both workload and learning sites.

Curriculum evaluation

At the end of each Early Years Program, students are asked to complete a 2-part evaluation form. The students self-rate their knowledge increases along a 4-point scale, from "not at all" to "a lot." In the second section, the students are asked to rate components of the program along a 7-point scale, from "strongly agree" to "strongly disagree." They are invited to provide comments on any aspect of the program.

In 2004, students from 5 consecutive rotations evaluated the program. In total, 89 students attended the workshops and 83 (93%) of them completed evaluation forms. Most of the students (51% to 93%) indicated that they had learned quite a bit or a lot about many of the topics (Table 1). Most students (55% to 78%) agreed or strongly agreed with many of the statements regarding the quality and importance of the program (Table 2). Approximately half of the students (48%) agreed or strongly agreed that the site visits were helpful.

Table 1. Students' perceptions of educational gains

TOPIC	% OF STUDENTS RESPONDING "QUITE A BIT" OR "A LOT"
Assessing normal growth and development in infants	69
Assessing normal growth and development in preschoolers	65
Importance of early brain development in infancy	82
Psychological risk factors in pregnancy that might affect positive maternal-infant attachment	78
Performing a prenatal psychosocial assessment	65
Factors that promote positive parent-infant attachment	83
Importance and assessment of postpartum depression	73
Neurologic examination of infants	51
Factors that adversely affect normal neurodevelopment of infants	70
Offering parents information about community resources	77
Importance of supporting parenting	72
Role of physician in promoting early childhood development	93

Table 2. Students' evaluations of program

ASPECT OF PROGRAM	% OF STUDENTS RESPONDING "AGREE" OR "STRONGLY AGREE"
Workshop accomplished the stated objectives	55
Material in the program is important for all medical students	70
Level of content met my needs	61
Handouts, curriculum, and resources were helpful	78
Discussing cases helped my learning	59
Videos were helpful to illustrate points	76
Site visits were useful in illustrating the principles of the program	48

All students provided additional comments that were generally positive. As many as 58% valued the information, discussions, resources, videos, cases, facilitators, and site visits. Suggestions for improving the curriculum included wanting more information on the neurologic examination. The students asked that site-visit information be provided in advance and for better organization of site visits to ensure direct access to parents, children, and on-site health professionals.

Discussion

There was a high response rate from students completing the evaluations in 2004; therefore, the results obtained were likely to have been fairly representative. Most of the student responses on the evaluations were positive; students seemed to view the content of the program as useful, and their awareness of issues related to early child development appeared to have increased.

Only half of the students, however, reported that the level of content met their needs. The medical students at McMaster University have a wide variety of backgrounds and differing levels of previous exposure, training, and experience with early years material. Some have had no clinical or educational exposure to children at all, while others have postgraduate degrees related to child development. Students also have various levels of interest and varied initial perceptions of the relevance of early development issues to their future practices. These differences have created challenges in presenting the material to students. Also, the program takes a broad perspective and interdisciplinary approach to the material, with a strong emphasis on preventive strategies and early detection of risks and delays rather than a specific diagnosis-and-treatment approach that students might expect. This might influence the perception that the level of content does not fully meet students' needs. However, the program perspective is unique and aims to help future physicians see themselves as part of an interdisciplinary team promoting optimal early child development.

EDITOR'S KEY POINTS

- Family physicians play a key role in the first years of children's lives, yet studies have shown that many family medicine residents and practising family physicians do not feel fully prepared to fill this role.
- Based on the results of a survey to identify gaps in the undergraduate curriculum, the Department of Family Medicine at McMaster University in Hamilton, Ont, developed an early childhood development curriculum for undergraduate medical clerks on their family medicine rotations. The program explores the interaction between "nature" and "nurture," and emphasizes community resources.
- Preliminary evaluation by the clinical clerks showed that, while most had learned a lot about the topics, only about half thought the content met their needs. Based on the feedback, further improvements were made to the program.

POINTS DE REPÈRE DU RÉDACTEUR

- Le médecin de famille joue un rôle-clé au cours des premières années de la vie des enfants et pourtant, certaines études indiquent que plusieurs résidents en médecine familiale et médecins de famille en pratique se considèrent mal préparés pour ce rôle.
- À partir d'une enquête visant à identifier les déficiences du curriculum de premier cycle, le Département de médecine familiale de l'Université McMaster à Hamilton (Ont.) a instauré des cours sur le développement des jeunes enfants à l'intention des étudiants en médecine qui effectuent leurs stages de médecine familiale. Le programme explore les interactions entre « génétique et environnement », et insiste sur les ressources communautaires.
- Une évaluation préliminaire des stagiaires indiquait que même si la plupart d'entre eux avaient acquis beaucoup de connaissances sur les sujets enseignés, seulement la moitié croyaient que le contenu répondait à leur besoins. Leurs commentaires ont permis d'apporter des améliorations supplémentaires au programme.

The inability to measure the effectiveness of this program, other than through the self-evaluation form, can be considered a limitation. At present, examinations do not connect students' performances directly to the early years sessions. A topic-specific set of questions is currently being developed, however, to add to the end-of-clerkship examinations.


Future direction

Some student suggestions have led to program refinements. Increased focus on the neurologic examination, for example, was addressed by providing videos as visual examples. The site visits were simplified and

better organized, with a professional at each site meeting students to improve the experience. Also, the recent restructuring of the undergraduate medical program at McMaster provided opportunity for the Early Years Steering Committee to encourage a more comprehensive basic neurodevelopment curriculum in undergraduate medical education before clerkship. This inclusion will level the clerks' previous experience and provide a better base for a more clinically focused clerkship program. At present, we are exploring opportunities to expand the early years curriculum and create an inter-professional collaboration with student peers in nursing, rehabilitative sciences, and midwifery.

Although some of the suggested changes have been made, challenges persist. With the expansion of the program to accommodate increased student enrolment, more facilitators are needed to run the program. Providing a consistent, high-quality program with sessions running in several different communities is difficult. A number of strategies, such as faculty development workshops, are being fleshed out.

Conclusion

The Early Years Program takes a unique, broad approach in addressing the interaction of "nature" and "nurture" in early child development, and stresses community-based children's services. Feedback suggests that the goals of the Early Years Program for medical student clerks have been achieved. We plan on continuing to improve the program to meet the challenges of a changing undergraduate health science education, and to continue faculty development to ensure delivery of a high-quality curriculum. 

Competing interests

None declared

Correspondence to: Dr Janus, McMaster University, Patterson Bldg, Room 218, 1200 Main St W, Hamilton, ON L8N 3Z5; telephone 905 521-2100, extension 77616; fax 905 574-6665; e-mail janusm@mcmaster.ca

References

1. Zuckerman B, Halfon N. School readiness: an idea whose time has arrived. *Pediatrics* 2003;111(6 Pt 1):1433-6.
2. McCain MN, Mustard JF. *Reversing the real brain drain: Early Years Study*. Toronto, ON: Ontario Children's Secretariat; 1999. Available from: [wwwFOUNDERS.NET/ey/home.nsf/a811f0e8afbb2a7985256786003a3dd9/1e4ad2a677be034685256a4700737a3b/\\$FILE/early_years_study.pdf](http://wwwFOUNDERS.NET/ey/home.nsf/a811f0e8afbb2a7985256786003a3dd9/1e4ad2a677be034685256a4700737a3b/$FILE/early_years_study.pdf). Accessed 2008 Apr 16.
3. McCain MN, Mustard JF. *The Early Years Study, three years later*. Toronto, ON: The Founders Network; 2002. Available from: [wwwFOUNDERS.NET/fn/papers.nsf/0/39348cb576890e6685256c32005a7cb6/\\$FILE/EYReview-Aug2002.pdf](http://wwwFOUNDERS.NET/fn/papers.nsf/0/39348cb576890e6685256c32005a7cb6/$FILE/EYReview-Aug2002.pdf). Accessed 2008 Apr 16.
4. Ministry of Children and Youth Services Ontario. *Programs and services* [website]. Toronto, ON: Government of Ontario; 2007. Available from: www.GOV.ON.CA/children/english/programs/index.html. Accessed 2008 May 8.
5. Oldershaw L. *A national survey of parents of young children*. Toronto, ON: Invest in Kids; 2002.
6. Gold M, Shaw E. Short report: common parenting problems. Experience and comfort level in family medicine residency. *Can Fam Physician* 2003;49:619-22.
7. University of Alberta. *Paediatric clinical skills: general course outline* [website]. Edmonton, AB: University of Alberta; 2006. Available from: www.MED.UALBERTA.CA/education/ugme/clinaled12/clinskills_paediatric.cfm?yr=2. Accessed 2008 May 8.
8. 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(2):110-5.
9. O'Keefe M, White D. Continuing effectiveness of a community child health programme for medical students. *Med Teach* 2006;28(8):683-9.
10. Piachaud J. Teaching learning disability to undergraduate medical students. *Adv Psychiatr Treat* 2002;8:334-41.
11. Kalet AL, Juszczyk L, Pastore D, Fierman AH, Soren K, Cohall A, et al. Medical training in school-based health centers: a collaboration among five medical schools. *Acad Med* 2007;82(5):458-64.
12. Comley L, Mousmanis P. *Improving the odds: healthy child development*. Toronto, ON: Ontario College of Family Physicians; 2004. Available from: www.OCFP.ON.CA/local/files/CME/Healthy%20Child%20Development/FINAL%20BOOK%20APR%202029.pdf. Accessed 2008 Apr 16.
13. Comley L. *Early years curriculum*. Hamilton, ON: McMaster University; 2002.
14. Rourke L, Leduc D, Rourke J, Constantin E. Health supervision from 0 to 5 years using the Rourke Baby Record 2006. *Can Fam Physician* 2006;52:1273-4.
15. Wilson LM, Reid AJ, Midmer DK, Biringer A, Carroll JC, Stewart DE. Antenatal psychosocial risk factors associated with adverse postpartum family outcomes. *CMAJ* 1996;154(6):785-99.
16. Society of Obstetrics and Gynaecologists of Canada. *Healthy beginnings: guidelines for care during pregnancy and childbirth*. Policy Statement No 71. Ottawa, ON: Society of Obstetrics and Gynaecologists of Canada; 1998.

