Shared Canadian Curriculum in Family Medicine (SHARC-FM)

Creating a national consensus on relevant and practical training for medical students

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Abstract

Problem addressed In 2006, leaders of undergraduate family medicine education programs faced a series of increasing curriculum mandates in the context of limited time and financial resources. Additionally, it became apparent that a hidden curriculum against family medicine as a career choice was active in medical schools.

Objective of program The Shared Canadian Curriculum in Family Medicine was developed by the Canadian Undergraduate Family Medicine Education Directors and supported by the College of Family Physicians of Canada as a national collaborative project to support medical student training in family medicine clerkship. Its key objective is to enable education leaders to meet their educational mandates, while at the same time countering the hidden curriculum and providing a route to scholarship.

Program description The Shared Canadian Curriculum in Family Medicine is an open-access, shared, national curriculum (**www.sharcfm.ca**). It contains 23 core clinical topics (determined through a modified Delphi process) with demonstrable objectives for each. It also includes low- and medium-fidelity virtual patient cases, point-of-care learning resources (clinical cards), and assessment tools, all aligned with the core topics. French translation of the resources is ongoing.

Conclusion The core topics, objectives, and educational resources have been adopted by medical schools across Canada, according to their needs. The lessons learned from mounting this multi-institutional collaborative project will help others develop their own collaborative curricula.

EDITOR'S KEY POINTS

- The Shared Canadian Curriculum in Family Medicine (SHARC-FM) is a freely available curriculum of objectives and practical educational tools to support medical student training in family medicine clerkship. While the resources in SHARC-FM were developed for medical students, they are also useful for residents and practising family doctors.
- A national consensus process was used to identify the clinical topics essential to family medicine clerkship, as well as the learning objectives for each topic.
- A variety of learning materials aligned with these topics are freely available on the SHARC-FM website (**www.sharcfm.ca**).

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Le Curriculum canadien de stages en médecine familiale (CCC-MF)

Vers un consensus national pour une formation pratique pertinente pour les étudiants en médecine

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Résumé

Problème à l'étude En 2006, les responsables des programmes de premier cycle en médecine familiale ont constaté que de plus en plus de facultés modifiaient leurs curriculums en raison de contraintes de temps et de ressources financières. En outre, il est apparu que plusieurs facultés de médecine proposaient un curriculum caché de nature à dissuader les étudiants de faire carrière en médecine familiale.

Objectif du programme Le Curriculum canadien de stages en médecine familiale (CCC-MF) a été créé par les directeurs de la formation de premier cycle en médecine familiale au Canada et approuvé par le Collège des médecins de famille du Canada en tant que projet susceptible de faciliter la formation des étudiants dans leurs stages en médecine familiale. Son objectif principal est de faire en sorte que les responsables de formation soient en mesure de répondre à leurs obligations de formation, tout en faisant obstacle aux curriculums cachés et en offrant aux étudiants une possibilité d'obtenir une bourse d'étude.

Description du programme Le CCC-MF est un curriculum national commun entièrement accessible **(www.sharcfm.ca)**. Il est formé de 23 sujets cliniques essentiels (choisis à l'aide d'un processus Delphi modifié), chacun assorti d'objectifs démontrables. On y trouve aussi des cas fictifs de patients présentant une fidélité faible ou moyenne, des ressources d'apprentissage (cartes cliniques) relatives au site d'intervention et des outils d'évaluation, tout cela en lien direct avec les sujets essentiels. Une traduction en français de ces ressources est en cours.

Conclusion Les sujets essentiels, les objectifs et les ressources éducationnelles ont été adoptés par des facultés de médecine un peu partout au Canada, en fonction de leurs besoins. Les leçons tirées de la création de ce projet impliquant la collaboration de plusieurs institutions aideront d'autres facultés à établir leurs propres curriculums.

POINTS DE REPÈRE DU RÉDACTEUR

- Le Curriculum canadien de stages en médecine familiale (CCC-MF) est un curriculum disponible gratuitement, qui comprend des objectifs et des outils de formation pratique contribuant à la formation des étudiants durant leurs stages en médecine familiale. Même si le contenu du CCC-MF a été créé pour les étudiants du premier cycle, il est aussi pertinent pour les résidents et les médecins de famille en pratique.
- Un consensus national a été utilisé pour identifier les sujets cliniques essentiels dans les stages en médecine familiale, de même que les objectifs d'apprentissage pour chacun de ces sujets.
- Différents outils d'apprentissage en lien avec ces sujets sont disponibles gratuitement sur le site web du CCC-MF **(www.sharcfm.ca)**.

Cet article a fait l'objet d'une révision par des pairs.
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The Shared Canadian Curriculum in Family Medicine (SHARC-FM) is a curriculum of objectives and practical educational tools to support medical student training in family medicine clerkships. Understanding the development of the curriculum, as well as the lessons learned, might be of help to others leading large collaborative curriculum projects. While the resources in SHARC-FM have been developed for medical students, they are also useful to residents and practising family doctors.

Objective of program

When the SHARC-FM project began in 2006, academic family medicine in Canada faced many challenges. Medical schools were creating their own online learning modules with minimal collaboration. Accreditation standards for medical schools had also changed, requiring medical schools to identify and track the types of patients students were expected to see during each clerkship rotation and provide alternative learning experiences if such patients were not encountered.[1] As a result, if a student failed to acquire appropriate experiences caring for patients with asthma, for example, the medical school was then expected to provide an asthma learning event replicating a patient encounter.

Simultaneously, our specialty struggled with low percentages of students choosing family medicine as a career. Students interested in family medicine were exposed to comments and other signals dissuading them from choosing family medicine, a phenomenon known as the *hidden curriculum*.[2] Finally, there was minimal faculty time (0.2 to 0.6 full-time equivalent) protected at each school for undergraduate family medicine curriculum development.[3]

The Canadian Undergraduate Family Medicine Directors (CUFMED) existed as a group of representatives from all Canadian university departments of family medicine. With meeting support from the College of Family Physicians of Canada (CFPC), CUFMED functioned as an autonomous group and met annually to provide networking and information sharing for its members. At its 2006 meeting, CUFMED agreed to develop educational resources to support medical student learning during family medicine clerkship rotations while also portraying the scientific rigour of our field. The project became SHARC-FM.

Program description

Below, we describe SHARC-FM's development using the 6-step iterative framework for curriculum development described by Kern and colleagues (**Box 1**).[4] We used this framework as a guide for our project, as it was known to us, is simple, and is prominent in the field of medical education.

Problem identification and general needs assessment. The new accreditation standards and the limited faculty time at each Canadian department of family medicine were driving forces for this project. Additionally, all Canadian family medicine undergraduate directors were being given substantial mandates to expand the presence of family medicine within each school's curriculum, usually without additional resources. While several departments of family medicine had embarked on creating educational resources to address gaps in students' exposure to patients, progress was slow and expensive, and efforts were uncoordinated.

Outside of family medicine, the only similar project we could identify was the Computer-assisted Learning In Pediatrics Project (CLIPP) cases.[5] Initially fostered by the Council on Medical Student Education in Pediatrics,[6] CLIPP was a collaborative development of online cases to support medical student learning in pediatrics.[4] It now operates in a non-profit subscription model.[7]

Targeted needs assessment. While CUFMED members were supportive of the development of a national curriculum, many were hesitant over concerns about lack of time and financial resources. Using a deliberative inquiry[8] approach to curriculum development, we first identified the needs of various stakeholders in our curriculum at our in-person meetings, as listed in **Table 1**. We then used these needs to determine the principles that would guide the development of the curriculum. These core principles were discussed, debated, and revised through in-person and online discussions over a 2-year period, leading to the final version in 2008 (**Table 2**).[9]

Decisions were made to deliberately use language and develop tools to counter the hidden curriculum, emphasizing a core feature of family medicine: evidence-based clinical excellence in a patient-centred model.

Box 1. Six steps in curriculum development

Kern and colleagues identified the following steps in curriculum development:

- Problem identification and general needs assessment: the main challenges and context, and how other groups have dealt with them, are described
- Targeted needs assessment: the key needs of the curriculum users are identified and clarified
- Goals and objectives: the goals of the curriculum are made clear, and the objectives to support curriculum development are defined
- Educational strategies: the ways to deliver learning opportunities are decided upon
- Implementation: issues related to implementation are described
- Evaluation and lessons learned: the ability of the curriculum to deliver on goals is reported and lessons learned are shared

Data from Kern et al.[4]

Our group agreed on the following vision for SHARC-FM: that it be a national curricular collaboration of family medicine undergraduate education leaders, comprising a set of key clinical scenarios and competency objectives for students in family medicine clerkships, backed up by a matrix of educational resources for learning and assessment that would be free and available to all members and the public.

Table 1. Stakeholder groups and needs for a national family medicine clerkship curriculum

GROUP	NEEDS
Family medicine undergraduate education leaders	• Time-efficient (ie, must not be a big burden) • Supportive of the ED-2 criteria (ie, the clinical experiences students are required to have for the purposes of program accreditation) • Voluntary (ie, must not be a prescribed curriculum) • Available in both official Canadian languages (French and English) • Developed along a family medicine perspective and spectrum of care (ie, not simply a collection of ambulatory medicine resources)
Medical schools	• Respectful of local control over local curriculum • Rigorous in development
Students	• Easily accessible • Directly supportive of learning of key topics in family medicine • Kept up to date
Patients	• Reliable and kept up to date, supporting up-to-date clinical care by learners
Clinical preceptors	• Easily accessible

Goals and objectives. By consensus, we chose to initially focus on determining the core clinical scenarios, as this was the greatest common need of undergraduate family medicine programs. Also, by focusing on the core clinical scenarios, we believed this would be a knowledge domain that would immediately resonate and be easily understood by our external stakeholders. Finally, we anticipated that this would be less difficult than determining broader competency objectives and would enable early progress in developing the curriculum.

Over several years, we conducted surveys and held in-person meetings to create a list of key clinical scenarios. In this modified Delphi process,[10] we used a total of 7 phases to refine our list to 23 core topics. We started with a rough list of potential topics comprising the top 20 postgraduate clinical topics for Canadian family medicine residency training,[11] the top diagnoses made by family doctors,[12,13] data on the most common concerns patients bring to family doctors,[14,15] and additional topics our primary authors thought should be part of the first iteration. We also included "red herrings"—topics that should likely not make it to the final list—to confirm the effectiveness of our process. Respondents to the surveys were blinded to the fact that there were deliberate red herrings.

This first list of 48 topics went out to CUFMED members by survey for feedback on the importance of each topic for medical students in family medicine clerkships.

Table 2. Guiding principles for SHARC-FM

PRINCIPLE	DESCRIPTION
Shared and open sourced	The curricular materials would be developed together and freely shared. All Canadian departments of family medicine would endeavour to participate in their development. There would be no profit derived from the distribution of any materials
Voluntary	The materials in SHARC-FM would be educational resources for local family medicine education programs to use to support their curriculum. In other words, SHARC-FM would not dictate what local curricula would be
Design methodology	The materials in SHARC-FM would be fully aligned and comprise a range of resources for learning and assessment. They would be developed according to pedagogic standards, and a scholarly approach would be pursued at all times. SHARC-FM would provide a route to scholarship for its contributors
Family medicine based	SHARC-FM would be grounded in family medicine: ie, anchored in the patient-centred clinical method[9] and the longitudinal relationship that patients have with their family doctors, and based on evidence that is relevant to family medicine contexts
Bilingual	SHARC-FM would seek to have all materials available in both French and English, likely through external funding achieved once a substantial portion of the curriculum was built and demonstrated to be successful

SHARC-FM—Shared Canadian Curriculum in Family Medicine.

The survey responses, comments, and suggestions for additional topics were used to refine the list and were sent back in another survey. Two more cycles of surveys and refinement were conducted, followed by presentation of the fifth version at a gathering. After these 5 phases, we had 20 core topics. We later returned to the topic list for an additional 2 cycles of debate and refinement, leading us to our current 23 core clinical topics. None of the red herrings made it through the first 4 cycles.

An additional project is under way to determine the skills or competencies that a medical student needs (eg, "able to write a prescription"), the results of which will be reported when complete.

The complete clinical scenario list, which includes presentations (such as cough), established conditions (such as hypertension), and preventive care, is found in **Box 2**.

As a group that had spent 2 years refining our vision and principles and more time coming to a set of core clinical scenarios, we were impatient to get started on creating learning resources. We made a tacit assumption that a common list of topics would translate into a shared understanding of the objectives for each topic and used the topic areas alone to guide the development of educational resources. This assumption was wrong.

It became apparent that we had different ideas about what content should be taught or tested. As a result, we reconvened several times from June 2011 to June 2012, working in small and large groups to develop common objectives for each topic using an approach based on key features[16] by ensuring that we captured issues where medical students in family medicine clerkships are most likely to go wrong and critical "cannot miss" issues. We used another modified Delphi process (series of surveys and meetings) to reach unanimous agreement on the objectives for each of the clinical scenarios. The objectives for ischemic heart disease are outlined in **Box 3** as an example. The full objective set is available at **www.sharcfm.ca**.

Educational strategies. We have developed a series of materials to support student learning and assessment around our curriculum topics, including the following.

Point-of-care, hand-held learning resources (Canadian Family Medicine Clinical Cards): These clinical cards provide handy information that assists in clinical reasoning and management, including recognition of red flags and adapting care to patients' contexts. An example is the exercise prescription clinical card, which is shown in **Figure 1**.[17] Clinical cards are made available for electronic downloading and distribution, and some schools choose to print hard copies for their students and preceptors.

Paper cases: The CUFMED members have contributed paper cases that are aligned with the topics and objectives within SHARC-FM. These cases can be used by schools to assist with delivering small group learning sessions.

Virtual patients: Led by David Topps of the University of Calgary in Alberta, a series of virtual patient cases have been developed. These are online simulations of patient encounters in which learners work through a case making decisions on patient assessment and examination, interpretation of findings, diagnosis, and management.

Box 2. Clinical scenarios for SHARC-FM

A1: abdominal pain
A2: anxiety
A3: asthma
A4: chest pain
A5: contraception
A6: cough
A7: depression
A8: dizziness
A9: fatigue
A10: fever
A11: headache
A12: hypertension
A13: ischemic heart disease
A14: low back pain
A15: palliative care
A16: prenatal care
A17: type 2 diabetes
A18: baby, child, and youth preventive care
A19: adult female preventive care
A20: adult male preventive care
A21: health care of the elderly
A22: joint pain
A23: skin conditions

SHARC-FM—Shared Canadian Curriculum in Family Medicine.

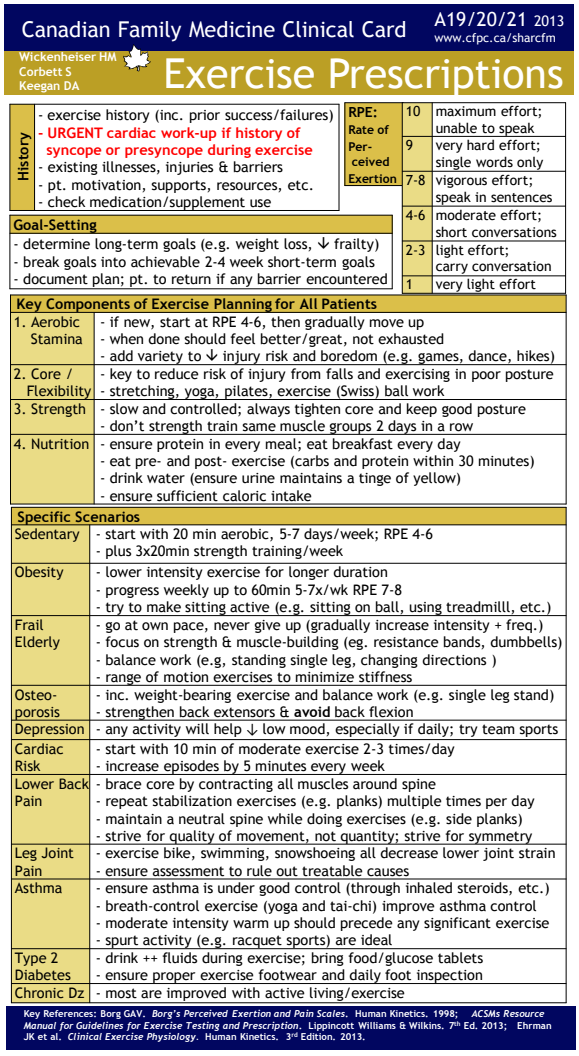
Box 3. Objectives for IHD

By the end of family medicine clerkship, students will be able to do the following with respect to IHD:

- Identify patients at elevated risk of IHD and calculate their 10-y cardiovascular risk using the Framingham risk score
- Propose a patient-centred initial management plan for primary prevention of IHD
- Identify which patients require further investigation to confirm a diagnosis of IHD
- Describe an early post–ischemic event management plan including lifestyle changes, medications, psychosocial support, cardiac rehabilitation, etc
- Propose a surveillance and management plan for secondary prevention of cardiovascular events in patients with IHD

IHD—ischemic heart disease.

Figure 1. Example Canadian Family Medicine Clinical Card



Canadian Family Medicine Clinical Card A19/20/21 2013 www.cfpc.ca/sharcfm

Wickenheiser HM, Corbett S, Keegan DA

Exercise Prescriptions

History
- exercise history (inc. prior success/failures)
- **URGENT cardiac work-up if history of syncope or presyncope during exercise**
- existing illnesses, injuries & barriers
- pt. motivation, supports, resources, etc.
- check medication/supplement use

RPE: Rate of Perceived Exertion

10	maximum effort; unable to speak
9	very hard effort; single words only
7-8	vigorous effort; speak in sentences
4-6	moderate effort; short conversations
2-3	light effort; carry conversation
1	very light effort

Goal-Setting
- determine long-term goals (e.g. weight loss, ↓ frailty)
- break goals into achievable 2-4 week short-term goals
- document plan; pt. to return if any barrier encountered

Key Components of Exercise Planning for All Patients

1. Aerobic Stamina	- if new, start at RPE 4-6, then gradually move up - when done should feel better/great, not exhausted - add variety to ↓ injury risk and boredom (e.g. games, dance, hikes)
2. Core / Flexibility	- key to reduce risk of injury from falls and exercising in poor posture - stretching, yoga, pilates, exercise (Swiss) ball work
3. Strength	- slow and controlled; always tighten core and keep good posture - don't strength train same muscle groups 2 days in a row
4. Nutrition	- ensure protein in every meal; eat breakfast every day - eat pre- and post- exercise (carbs and protein within 30 minutes) - drink water (ensure urine maintains a tinge of yellow) - ensure sufficient caloric intake

Specific Scenarios

Sedentary	- start with 20 min aerobic, 5-7 days/week; RPE 4-6 - plus 3x20min strength training/week
Obesity	- lower intensity exercise for longer duration - progress weekly up to 60min 5-7x/wk RPE 7-8 - try to make sitting active (e.g. sitting on ball, using treadmill, etc.)
Frail Elderly	- go at own pace, never give up (gradually increase intensity + freq.) - focus on strength & muscle-building (eg. resistance bands, dumbbells) - balance work (e.g, standing single leg, changing directions) - range of motion exercises to minimize stiffness
Osteo-porosis	- inc. weight-bearing exercise and balance work (e.g. single leg stand) - strengthen back extensors & **avoid** back flexion
Depression	- any activity will help ↓ low mood, especially if daily; try team sports
Cardiac Risk	- start with 10 min of moderate exercise 2-3 times/day - increase episodes by 5 minutes every week
Lower Back Pain	- brace core by contracting all muscles around spine - repeat stabilization exercises (e.g. planks) multiple times per day - maintain a neutral spine while doing exercises (e.g. side planks) - strive for quality of movement, not quantity; strive for symmetry
Leg Joint Pain	- exercise bike, swimming, snowshoeing all decrease lower joint strain - ensure assessment to rule out treatable causes
Asthma	- ensure asthma is under good control (through inhaled steroids, etc.) - breath-control exercise (yoga and tai-chi) improve asthma control - moderate intensity warm up should precede any significant exercise - spurt activity (e.g. racquet sports) are ideal
Type 2 Diabetes	- drink ++ fluids during exercise; bring food/glucose tablets - ensure proper exercise footwear and daily foot inspection
Chronic Dz	- most are improved with active living/exercise

Key References: Borg GAV. *Borg's Perceived Exertion and Pain Scales*. Human Kinetics. 1998; *ACSMs Resource Manual for Guidelines for Exercise Testing and Prescription*. Lippincott Williams & Wilkins. 7th Ed. 2013; Ehrman JK et al. *Clinical Exercise Physiology*. Human Kinetics. 3rd Edition. 2013.

Reproduced from Wickenheiser et al.[17]

Multiple-choice questions: These are for summative assessment of student knowledge and are available to family medicine clerkship committees in Canada who wish to use them to augment their own examination banks. The questions are blueprinted to the clinical scenario objectives. (These questions are held securely at the CFPC headquarters and are couriered to interested schools on encrypted media.)

Other resources: We have also curated key articles that are aligned with each of the objectives. These background learning materials serve as self-learning resources for students and are also available at **www.sharcfm.ca**.

Implementation. This project has been exciting and challenging, with numerous implementation issues to explore and overcome.

Support: The CFPC provides ongoing funding for administrative and operating costs of SHARC-FM, and strategic guidance through its Undergraduate Education Committee. This support was critical during the early formative stages. Departments of family medicine and undergraduate medical education offices across the country have provided additional financial support and e-learning technology expertise, which have been also critical to maintaining momentum.

Peer review: New educational objects and resources developed through SHARC-FM are subjected to blinded peer review that is coordinated by the lead members for each type of resource. Reviewers assess the quality of material design and the accuracy of medical content, and ensure the absence of third-party material for which permission has not been granted and that there is no identifying patient information. Authors of materials must address reviewer comments to the satisfaction of the resource type lead before being formally published as a SHARC-FM resource. Multiple-choice questions are subjected to non-blinded peer review during question-writing workshops.

Dissemination: The learning resources within SHARC-FM have been made available to the public through **www.sharcfm.ca**. Upon reviewing our foundational research and peer-review process, MedEdPORTAL,[18] the online publishing arm of the American Association of Medical Colleges, granted our initiative Special Collection Reviewed status, which has further streamlined the ability for resources developed under SHARC-FM to be broadly disseminated. MedEdPORTAL now houses SHARC-FM materials within the iCollaborative section of its website.

Local implementation: A key guiding principle of SHARC-FM has been that the implementation of its materials at local schools was optional. As a result, the local implementation of SHARC-FM at each Canadian medical school has varied, with some schools replacing their previous ED-2 criterion scenarios[1] (ie, the clinical experiences students are required to have for the purposes of program accreditation) with those within SHARC-FM, and others using the resources to supplement the learning resources they provide to students. With the recent completion of the SHARC-FM clinical scenario objectives, many schools have replaced or refined their current relevant objectives to align with these new national objectives. Many schools direct medical students to SHARC-FM resources, and 8 schools have borne the cost of printing hard copies of the point-of-care clinical card handbooks for their clinical clerks. Some schools have decided to distribute them additionally to residents and preceptors, who have informally reported that they are welcome and useful resources for their teaching and as a support for their own clinical care.

Future implementation steps: Translation of all of our objectives into French has occurred, while translation of our clinical cards is under way. We plan to launch the French site, **www.cccmf.ca** (Curriculum canadien commun de stages en médecine familiale), in the summer of 2017. At that time, we will also be launching online formative testing modules.

Evaluation and lessons learned. The vision for SHARC-FM—to be a national collaboration of shared objectives and learning resources to support student learning in family medicine—is being delivered. While the curriculum is still growing and maturing, Canadian family medicine clerkships now have this national consensus on topics, objectives, and other resources to draw upon. Getting to this point has not been easy, and we have learned lessons that will help others develop their own collaborative curricula, as follows.

Guiding principles: Clarifying and understanding all of our principles at the beginning of this project proved to have been a crucial step in guiding our handling of ongoing challenges and opportunities. We encountered numerous decisions that we were able to negotiate because we had already established our principles, such as whether to collaborate with a fee-for-access curriculum in another country (we did not). Regularly articulating our principles and adhering to them also enabled us to maintain momentum even though the membership of CUFMED was in constant flux; new members were immediately able to understand the role of SHARC-FM and how our decisions were guided.

Objectives: As described above, we erred in assuming each member of our group would have the same understanding of what should be learned for each of the clinical scenarios. This led to confusion and a derailing of our momentum. Having recognized this error, we were stimulated to develop and follow a rigorous process for developing our objectives. As a result, we have a strong set of objectives that are specific to each of the topics and that have been useful for schools to adopt for local curriculum development.

Structure[19]*:* Having an overall lead editor, as well as leaders for resource types and curriculum topics, has been important. In addition, the explicit support of our project leaders' department heads has led to vital protected academic time to work on our initiative. The project was initially run in a shared-leadership model in which members were invited to contribute in their own way. This model failed, with members not being sure how best to focus their efforts.

We openly discussed this challenge, and our members unanimously agreed that they wanted firm direction during the early phases of the curriculum's development. We empowered leaders to direct roles and jobs, such as assignment of objective-development tasks, while maintaining the ability of individuals to contribute meaningfully to content. With this new type of direction, the project gained momentum. As the curriculum matured, we have moved to an editorial board model of policy and process decision making, with membership including undergraduate family medicine leaders and a student chosen by the CFPC Section of Medical Students.

Increasing from annual to biannual meetings increased progress and momentum by providing protected time isolated from the day-to-day work at members' home institutions. Departments of family medicine largely took a leap of faith on this project by funding their delegates' repeated travel, thus enabling dynamic and productive meetings.

Buy-in from stakeholders: Rather than advising deans of what they "must do," SHARC-FM offered collaboratively developed material for their schools' use, at no cost, if they or their family medicine programs deemed it useful. This approach was key to the successful uptake of our material by most medical schools in Canada. Getting broad participation from all schools has further strengthened our community of educators, stimulating further collaborations.

Parallel curricular development: Not long after CUFMED began discussing and debating the guiding principles for SHARC-FM, the Paediatric Undergraduate Program Directors of Canada group started working on its own national collaborative curriculum called *canuc-paeds* (Canadian Undergraduate Curriculum in Paediatrics).[20] The leads for both SHARC-FM and canuc-paeds regularly shared progress updates, specifically sharing challenges each initiative encountered. This parallel development built momentum for both curricula, as we learned from each other's struggles and successes, and avoided each other's traps.

Scholarship: This project has led to new scholarly work in undergraduate family medicine education, delivering on a key purpose of SHARC-FM. Scholarship includes modified Delphi work to determine the core clinical scenarios and competency objectives, and the development of a new process to identify the best background resources for student learning on these topics.[21] Additionally, through our peer-review process and our Special Collection Reviewed status with MedEdPORTAL, our members have been able to get their learning resources recognized as peer-reviewed publications. Finally, this project has led to the development of a medical education elective[22] for medical students and a number of national and international workshops on how to lead multi-institutional curriculum collaborations.

Discussion

Over the course of SHARC-FM's development, it became apparent that in addition to the explicit principles (**Table 2**[9]) we also had a number of tacit[23] principles that

were guiding our work, but which we had not described. With our regular project reflection, we came to identify these "extra" principles as follows.

- Quality of development would be valued over speed, being mindful that "the best is the enemy of good"[24] (ie, we would also not get bogged down by striving for perfection).
- Not all member schools would be able to contribute to curriculum development to the same extent, as a result of differences in protected faculty time for undergraduate education and availability of resources, and this must be accepted.
- Learners, particularly medical students, should be involved in the development of educational materials. Medical students and residents have contributed heavily to the development of the virtual patient cases and clinical cards.
- The curriculum should embrace interprofessionalism[25] in a family medicine context. This became apparent in our objectives development in which effective engagement of other health professionals recurred as a theme.
- The visual appearance of our materials should be "sharp" and bold, to reflect the dynamic and rigorous clinical field.

This project has been in development since 2006. While we have presented it according to the linear cycle suggested by Kern et al,[4] it has not developed in such an orderly fashion. Just as Kern and colleagues described,[4] the development of this curriculum has been iterative and has bounced around the stages of their cycle. Sometimes this was planned, sometimes not.

There was no other large collaborative family medicine curriculum available at the origin of SHARC-FM. This has since changed: the Society of Teachers of Family Medicine (STFM) worked with the same non-profit group that governs the CLIPP cases to create fmCASES, a series of online virtual patient modules available on a subscription basis. The STFM has also created the National Clerkship Curriculum, which outlines the key clinical issues and specific objectives "core" to family medicine clerkships and which guides the ongoing maturation of fmCASES. The STFM and SHARC-FM have begun collaborating, with our chief editor sitting as a member of the National Clerkship Curriculum editorial board. The STFM now identifies the SHARC-FM collection as a resource for its members.

While SHARC-FM was still in its early phases, the Association of Faculties of Medicine of Canada led a collaborative national initiative entitled the Future of Medical Education in Canada to look at "how the education programs leading to the medical doctor (MD) degree in Canada can best respond to society's evolving needs."[26] One of its enabling recommendations was to increase collaboration through sharing curricular and other resources. Clearly SHARC-FM directly delivers on this recommendation through its open-access and collaborative model of curriculum design and learning resource development.

A key impetus for SHARC-FM was the accreditation mandate for medical schools to define the clinical experiences students were required to have and to remedy any gaps.[1] While the medical school accreditation framework has undergone yet another considerable change since SHARC-FM began, this clinical experience accreditation mandate remains under the new elements 6.2 and 8.6,[27] and SHARC-FM continues to provide a national consensus approach to fulfilling it.

Conclusion

The effects of SHARC-FM are demonstrated by the adoption of the core topics, objectives, and educational resources by medical schools across Canada, according to their needs. The lessons we have shared—the importance of early agreement on principles and delivering on them, the need to develop one's own set of objectives, the need for a clear leader to initially lay out the steps required to get to the vision, the critical role of protected academic time and regular face-to-face meetings, and the importance of meeting the needs of stakeholders—are not specific to our project. Others can learn from us and deliberately address such issues to improve the likelihood of their own success and improve their efficiency in delivering on their own visions.

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