

Part I—The evaluation objectives: what are they, where do they come from, and how can they be used?

- Introduction..... 9
- I. An overview of the structure and the components of this definition of competence..... 9
- II. Some theoretical and further practical considerations in defining competence and in designing successful evaluations..... 12
- III. Further details on the nature of the evaluation objectives, and how they were derived 15
- IV. Using the evaluation objectives 27

Introduction

The purpose of Part I is to encourage and to help you to use the new evaluation objectives to inspire and structure your assessment of competence in family medicine, whether this be assessment of others, or of yourself. This will be done in four steps.

- First presented is an overview of the structure and components of this definition of competence. This will provide some familiarity with the terms used in the definition, and how the different components may be used to help reach the goal of the assessment or evaluation of competence for the purposes of certification.
- Second, there is a brief discussion of some of the theoretical and practical considerations in designing successful evaluations. These considerations were kept in mind throughout the development of the evaluation objectives, and are the reason behind most of the choices made and the methods used.
- Third, we will discuss in more detail what the evaluation objectives are, and how they were derived. Understanding this process and how it relates to the considerations in the previous section are essential if the evaluation objectives are to be used as intended and with maximal usefulness and effectiveness.
- Finally, a few examples will be given of how these evaluation objectives can be used at this time, followed by some of the additional possibilities for the near future.

Part II presents all of the evaluation objectives in detail. It should be noted that the information that follows is presented in a somewhat heuristic fashion, so much of what may not seem clear as it is being read for the first time should become easier to understand once all the information is obtained and digested. This definition of competence is not linear or hierarchical; the components are, however, complementary. How they fit together and how they work to guide the evaluation of competence will become more evident once the whole picture has been viewed and reflected upon.

I. An overview of the structure and the components of this definition of competence

There are four major components in this definition, which is specific to family medicine.

- 1. *The skill dimensions of competence:*** There are six essential generic skills that enable the family physician to deal competently with problems in the domain of family medicine. The competent family physician has the potential to use all the skills for any problem, but competence is also characterized by adapting the choice of the skills used to the specific needs of the problem at hand. The six skill dimensions are as follows:

- a. **The Patient-Centred Approach¹**
- b. **Communication Skills**
- c. **Clinical Reasoning Skills**
- d. **Selectivity**
- e. **Professionalism**
- f. **Procedure Skills**

This component is most useful in summative situations, and assessment of competence in any of the skill dimensions will be based on an adequate series of observations. Overall competence can be inferred when competence has been demonstrated in each of the six skill dimensions, and in the preferential use of the skills most appropriate to a particular problem.

2. **The phase of the clinical encounter dimension of competence:** This component is in a slightly secondary position, but plays a critical role in directing assessment toward the cognitive processes that are most critical to the competent resolution of a specific problem or situation. This dimension covers the steps or phases from the beginning to the end of a clinical encounter. It includes the processes usually identified with the hypothetico-deductive model of clinical problem solving, and with clinical decision making. It is most useful for directing and limiting assessment to the processes that are most likely to discriminate between competent and non-competent performances with respect to a specific problem or situation. For this reason it is also particularly useful for orienting additional learning for a trainee who is having recurrent or ongoing difficulty.
3. **The priority topics, the core procedures, and the themes:** These three, taken together, constitute a list of the problems or situations that the competent family physician should be able to deal with at the start of independent practice. As such, this component sets out and limits the basic content of the domain of competence in family medicine for the purposes of certification. The domain is, of course, only completely portrayed with the addition of the other three components, as they describe how competence is demonstrated or achieved for each of the problems or situations on these lists. This component is most useful for planning purposes, whether for teaching, learning, or assessment. The limits permit all concerned to concentrate their efforts, and the scope reassures one that overall competence can be reasonably inferred if assessment has been based on an adequate sampling of this content, from all three parts of the list. It also facilitates a periodic review of the domain to see if there are obvious gaps or duplications that may need to be corrected.
4. **The key features and the observable behaviours:** These are the operational evaluation objectives, using two different formats, which describe competence in relatively objective and observable terms for each of a series of specific situations that must be dealt with in family medicine. They represent

¹ We have opted to retain the use of the term “approach” rather than “method”. “Patient-centred approach” includes the “patient-centred method”, but the inverse is not necessarily as clearly true. Making sure our whole approach to practice is patient-centred is one of the defining characteristics of family medicine, so this term is used when defining competence.

the interactions between all the components for the purposes of assessing competence. There are approximately 1300 distinct elements in this component. This is the component that is most useful for the assessment of competence in specific situations, during daily clinical supervision.

In summary, this definition of overall competence in family medicine provides very problem-specific definitions of competence for a series of situations that must be dealt with by family physicians. These definitions are found in the fourth component, the key features and the observable behaviours, which constitute the individual and specific evaluation objectives for certification in family medicine.

The other components provide both the framework and the details necessary to make the evaluation objectives operational and effective. Each objective includes, either implicitly or explicitly, the skills and the phases necessary for competent resolution. Each objective is also part of a more general topic or procedure or theme. The degree of detail of description is quite variable, but it is sufficient to direct the evaluation of performance for the situation in question, and to make sure that the performances and processes assessed are truly reflective of competence.

The evaluation objectives, using the term more generally, are described and defined by all four components of this definition of competence. The evaluation objectives and the definition of competence are, for most intents and purposes, the same thing.

Determining competence using the evaluation objectives:

It is perhaps important to emphasize at this time that this whole definition of competence was developed without any reference to assessment tools or examination formats. This was done in order to have a definition of competence and evaluation objectives that are free of the unfortunate biases that are often imposed by predetermined instruments and formats.

We can, however, present both schematic and verbal representations of how this model could be used to determine competence.

Observed in practice	Skill dimensions	Phases	Competent Physician
a)	b)	c)	
Key features and observable behaviours	<ul style="list-style-type: none"> • Patient-centred approach • Communication skills • Clinical reasoning skills • Selectivity • Professionalism • Procedure skills 	Exhibited throughout the phases of the clinical encounter	<i>Continuous sampling, observation, and reflection based on (a), until this assures and satisfies the evaluators that the physician is competent in all the skills in (b)</i>
d) Priority topics, core procedures, themes			

This can also be expressed verbally:

“The evaluation objectives provide an extensive list of competencies in family medicine, in terms of key features and observable behaviours. Each of the competencies is specific to the situation to be dealt with and to the phases of the clinical encounter that are involved; each competence is linked to the six skill dimensions that are essential to overall competence in family medicine.

Competence will be determined by continuous sampling, observation, and reflection on an individual’s performances with respect to the key features and the observable behaviours until the evaluator(s) is (are) assured and satisfied that the individual is competent in all six of the skill dimensions essential to competence in family medicine.”

The exact assessment tools and examination formats can be developed later.

II. Some theoretical and further practical considerations in defining competence and in designing successful evaluations

Two concepts are briefly discussed in this section: the characteristics of successful evaluations; levels of competence from a cognitive point of view, and the greater usefulness of the higher levels in predicting overall competence. These two concepts were used as guiding principles during the development of the evaluation objectives; understanding them will help one to understand the structure of the evaluation objectives, and will improve the chances of their being used appropriately, to full advantage.

Characteristics of successful evaluations:

Any high-stakes evaluation (such as our certification process in family medicine) should strive to perform well on five characteristics.² It should be

- 1. Valid:** It should assess performances that are truly indicative of competence in the domain of tasks for the discipline in question.
- 2. Reliable:** The evaluation must measure performance in a consistent fashion, and distinguish between competent and non-competent performances.
- 3. Cost-effective:** This quality is important in terms of time, effort, and resources.
- 4. Acceptable:** Both candidates and evaluators must feel that the evaluation is pertinent, rigorous, and fair.
- 5. Positive in its effect on learning:** It should drive learning toward true competence rather than toward simply passing an examination.

² Van der Vleuten CPM. The assessment of professional competence: developments, research and practical implications. *Adv Health Sci Educ.* 1996;1:41-67.

The specific purpose of evaluation objectives is to provide clear direction for the development and use of assessment or evaluation tools or situations, so that these five criteria are met. The evaluation objectives should inform all types of evaluation: formative and summative, structured and unstructured, in-training and terminal, written and oral, and simulated and real-life clinical situations, to name but a few.

To succeed, the evaluation objectives should clearly describe the domain of competence to be tested, as well as competent performances for each of the tasks within the domain. As the particular nature of a competently performed task is somewhat problem specific, good evaluation objectives include a definition at the level of each problem-task interaction.

If a peer group uses a structured and validated approach to develop all of the steps above (problems in the domain, tasks, and problem-task interactions), we can be reasonably sure that an assessment based on this definition will test performances indicative of competence. We can feel comfortable that the test has been valid, and that the successful candidate is competent—in our case, to start an independent family practice. This approach also permits the identification of performances that are likely to discriminate best between competent and non-competent candidates. Testing that concentrates on such discriminators is more efficient and more likely to generate reliable results. Many other practical issues must, of course, be considered to ensure evaluation reliability, but a valid definition of the competence to be tested is a prerequisite. The more its details outline the elements of competent performances, the easier the development of reliable test instruments and specific test items. This model therefore also tends to improve cost-effectiveness.

Acceptability is a complex issue, but for most of the players (the teachers, learners, and candidates) it has little to do with psychometric qualities of an evaluation program. An evaluation of very high quality can be unacceptable if it doesn't look or feel right, if it is perceived as being too hard or too easy, or if it is perceived as being not useful for daily activities of practice, clinical teaching, and learning. Evaluation is acceptable if it fits into these daily activities, and if the process and the results of the evaluations are helpful to all the players in achieving their educational goals. Evaluation for certification must also, of course, be of high psychometric quality, but this is not sufficient if it is not first acceptable on the basis of how it looks and feels, how it fits in, and how it is useful.

The effect of evaluation on learning is closely related to acceptability, but merits a few specific comments. The perverse effects of preparing for examinations are well known to postgraduate training programs: the trainees are essentially lost for extensive periods to activities dedicated to preparing to pass examinations. These activities usually concentrate on content and behaviours that have little if anything to do with real competence. Indeed, many might say that they actually reduce competence, devaluing the skills and behaviours that are associated with competence, as these “are not on the exam”. The undeniable value and force of examinations in driving learning cannot be ignored, and were recognized throughout this project: the challenge was to express the evaluation objectives (and, hopefully, the examinations that are based on them) in terms that bring the preparation for examinations as close as possible to a preparation for true competence in family medicine.

Level of competence:

The second concept to be discussed is the difference between low and high levels of competence as far as cognitive skills are concerned, and the reasons why higher levels of competence may be more robust and efficient as indicators of overall competence, as well as being particularly pertinent to family medicine. This will also allow us to look at the difference between “performance” and “competence” and explain some of the preoccupations of the working group members as they developed this definition of competence in family medicine.

Evaluators really need to know what steps were taken, and why, in order to truly appreciate whether an operator acted in a competent manner while performing a task—the end result does not tell the whole story. It is difficult to assess competence without observing some performance, but the difference between the two terms is important. This difference between “competence” and “performance” is nicely illustrated by language-speaking skills. With respect to language, competence can be said to “refer specifically to the speaker’s knowledge of a system of rules that they have assimilated in one way or another. These rules allow them to be creative and produce an unlimited number of grammatically correct phrases. In addition it allows the speaker to determine whether a phrase is grammatically correct or not.”³ Performance does not necessarily require an intimate knowledge of the preceding—many people speak a language very well without being at all aware of the rules and the system. If we wish to truly assess competence, then we should also look at the systems and rules being used during the performance of a task.

This is also important when considering the levels of competence to be assessed. In any profession, many daily activities are routine and do not require a high level of competence. These might even be considered to be routine performances, done without much thought or reflection, where the outcome depends little on the competence of the operator. They are routine problems with clear-cut solutions. Many argue that professional competence is more than this: it is the ability to manage ambiguous problems, tolerate uncertainty, and make decisions with limited information. True competence is manifested in unfamiliar situations, and has been defined as “the capacity to demonstrate cognitive flexibility and adaptability when faced with novel situations in a given domain, rather than a ritualized set of responses to a predictable set of stimuli”.⁴ Medical diagnostic problems can be characterized as usually ill structured: not all the relevant information is available to the problem solver, the potential causes are numerous, and there is often not a definite solution. Solving these problems requires deliberate reasoning, not reflex reaction or simple recognition, which has been called “low-road transfer”. Deliberate reasoning involves the conscious abstraction from one context to another, or the “high-road transfer”⁵ of knowledge and skills. The highly competent individual is able to generalize

³ James L. Prolegomena to a theory of communicative competence. Champaign, IL: Center for Comparative Psycholinguistics, University of Illinois; 1969/2003.

⁴ Regehr G. Chickens and children do not an expert make. *Acad Med.* 1994;69(12):970-1.

⁵ Patel V, Kaufman D. On poultry expertise, precocious kids, and diagnostic reasoning. *Acad Med.* 1994;69(12):971-2.

abstracted knowledge across a wide range of situations—in essence, attaining competence involves a maximization of high-road transfer. Low-level competence is extremely task-specific, and competence on one task does not at all predict competence on other tasks. Higher-level competence is much more generalizable from one task to another; this is perhaps not surprising as the skills themselves are not very task-specific. Finally, competence at the higher levels usually predicts competence (or clear awareness of the lack of competence) with respect to lower-level skills; the contrary is not at all true.

It is worthwhile noting at this time that the family physician must be competent to deal with many well-defined problems, but he or she must also be especially competent at dealing with the many problems that are undifferentiated, where diagnoses may remain uncertain for extended periods of time, and where multiple other factors (e.g., other illnesses, psychosocial elements, preferences, resources) come into play and must be considered. The skills required to handle these situations correspond very closely to the above definition of the higher-level cognitive skills of true competence.

The implications of the above for a definition of competence for evaluation purposes are three: 1) the definition must include, either implicitly or explicitly, the how's and the why's of a competent performance of a task, not just the performance itself; 2) tasks requiring use of the higher levels of competence will permit us to make inferences about overall competence that are much more plausible than tasks requiring only the lower levels; 3) the higher levels of competence are particularly applicable and necessary for competence in family medicine. The working group maintained a healthy preoccupation with these three implications throughout. The key feature approach led naturally in this direction, requiring some definition of the how's and why's, and selecting tasks requiring the higher levels of competence, as these are often the ones that are most determinant of competence when handling a particular problem. The preoccupation was equally maintained when using approaches other than the key feature analysis.

III. Further details on the nature of the evaluation objectives, and how they were derived

This section starts with a brief description of the rationale for the revision of the evaluation objectives for certification, and of the methods used. Additional details on the four major components of the evaluation objectives will follow.

Revising the evaluation objectives:⁶

In 1998 the Board of Examiners of the College decided to review the processes leading to certification. A critical part of this process is the determination of competence at a level appropriate to the start of independent practice as a family physician, so the assessment of this competence also came under

⁶ This is only a very brief summary of the methodology used and of the results. Complete details have been presented in a series of reports to the College, and will also become available in a series of scholarly articles currently in preparation.

review. The essential first step in planning an assessment of competence is to define in sufficient detail that which constitutes the competence in question. Surprisingly, perhaps, existing definitions for family medicine were found not to be detailed enough for the purposes required. For example, the Four Principles of Family Medicine are useful as an overview, providing general goals and guideposts, but they are nowhere near detailed enough to provide clear direction for determining competence. This remained true even though a layer of precision had been added under each principle.

The Board, therefore, decided to go back to the beginning and develop a competency-based definition for the purposes of assessment for certification. It was decided to ground this definition in the experience of practicing family physicians. The opinions of these physicians were sought through a postal questionnaire asking four open-ended questions about how they would define competence in family medicine at the start of independent practice. The results of this survey were analyzed by a focus group, which identified a series of headings that could be used to describe competence. Reanalysis of the survey results according to these headings showed that competence was described in terms of five skill dimensions, the phases of the clinical encounter, and a certain number of priority topics. A sixth skill dimension, procedure skills, was subsequently added, for reasons explained in the next section.

These three components provided a clearer portrait of competence in family medicine, but it was still not detailed enough to provide adequate direction for the assessment of competence. The Board therefore charged other working groups to develop the detailed evaluation objectives using an appropriate combination of these components. A focus-group analysis approach was used, developing the evaluation objectives through multiple structured iterations, and two general formats were used for the final specific and operational evaluation objectives: key features and observable behaviours. These two together are the operational component or layer of the evaluation objectives: they direct how assessment of competence should be done in each situation under consideration.

The individual evaluation objectives themselves can be found elsewhere in this document under the appropriate headings. The next part of this section will, however, provide you with sufficient detail to understand what you should be looking for and how this will all fit together. There is obviously overlap between these various components—indeed a large part of competence is using them in the appropriate integrated fashion. From the pragmatic point of view it is most useful to separate them—this is essential for assessment, and quite likely preferable for teaching and learning at most stages of training.

Further details on the components of the evaluation objectives:

We will maintain the previous order of the components for the first parts of this section, but then discuss in detail the key features before coming back to the core procedures, themes, and observable behaviours. This follows more closely the order in which the components were developed, but, more important, the results of the key feature analysis had a major influence on subsequent steps. A full understanding of the key features makes it easier to understand why the core procedures, themes, and observable behaviours were developed as they were.

1. *The skill dimensions of competence:*

General definitions of each of the six skills are presented here. The operational definitions for assessment of competence in each will be found throughout the topics, core procedures, themes, key features, and observable behaviours.

a) The patient-centred approach: This well-known approach is a hallmark of family medicine and represents one of the most efficient and effective methods for dealing with problems. It does this by concentrating on the patient and his or her context rather than on the disease alone. In this way a shared understanding and common ground can be reached between the patient and the practitioner concerning goals for dealing with the problems at hand. This approach also helps these goals to be realistic and achievable. The details of the method are well established in the literature, and the evaluation objectives for this dimension of competence are derived directly from this information.

b) Communication skills: Certain skills and behaviours facilitate communication, and good communication is essential for competence. It is a complex skill that permeates most of our other activities. Good communication facilitates the use of the other skills when dealing with problems and improves chances of a successful resolution, whereas poor communication is likely to be very detrimental. Communication can be written or verbal, with patients or colleagues; it also involves listening and watching as much as or more than talking and showing. All of these aspects need to be assessed.

c) Clinical reasoning skills: This dimension deals with more familiar territory, and concerns the problem-solving skills used to deal with the so-called “medical aspects” of a problem. Although obviously knowledge dependent, knowledge alone is not sufficient. Many of the difficulties in this dimension are related to poor process, and not to knowledge deficiency. These difficulties in process have the most impact on competence, so assessment of the processes (how and why clinical reasoning is going on) is more important than assessing the final results or answers.

d) Selectivity: This dimension has not, to our knowledge, been previously described with respect to physician competence, although it is surely not an original idea. It is the term that was chosen to describe a set of skills that was frequently cited in the survey as characterizing the competent family physician: such a physician does not do things in a routine or stereotypical fashion, but is very selective in approach, adapting it to the situation and the patient. Competent physicians set priorities and focus on the most important; they know when to say something and when not to; they gather the most useful information without losing time on less contributory data, or they do something extra when it will likely be helpful. It is perhaps a subset of all the other dimensions, but it was used frequently enough in the descriptions of competence to merit its own dimension. As we saw earlier, selectivity is found at the higher levels of competence, and it could be an extremely robust indicator of overall competence when used for assessment purposes.

e) Professionalism: Acting professionally is a complex multi-faceted skill that has little effect by itself,⁷ but is an absolutely necessary complementary skill for competent practice. It facilitates the use of the other skills when dealing with problems and improves chances of a successful resolution, whereas acting unprofessionally is usually extremely detrimental, even when other skills are good. This dimension was the most frequently cited in the descriptions of competence: it includes all the responses that dealt with respect and responsibility to patients, to colleagues, to oneself, to the profession, and to society at large; it includes ethical issues, as well as most of the issues pertaining to lifelong learning and the maintenance of the quality of care; it also includes important attitudinal aspects such as caring and compassion.

f) Procedure skills: In the initial survey, skills around specific procedures and other psychomotor skills themselves were not often cited as being characteristic of competence. This was not surprising because the competence we are interested in is more a question of individuals knowing what procedures they are or are not competent to do, and respecting these limits, rather than being able to perform an infinite and unspecified list of procedures. On the other hand, certification does imply that the certificant is competent to perform a certain number of procedures, at the start of independent practice. For these reasons, procedure skills were added as the sixth skill dimension, and measures were taken to define this dimension for the purposes of assessment.

2. The phase of the clinical encounter:

Competence was also commonly described in terms of the phase of the clinical encounter without referring to a specific problem, e.g., “take a focused history, generate a good differential diagnosis, refer when indicated”. All of the survey responses of this nature were grouped together in this single dimension, using the following eight subheadings, or phases.

- i. Hypothesis generation (or early differential diagnosis)
- ii. History (gather the appropriate information)
- iii. Physical examination (gather the appropriate information)
- iv. Investigation (gather the appropriate information)
- v. Diagnosis (interpret information) (The term “diagnosis” is used in the general sense, and so includes problem identification.)
- vi. Treatment (or management)
- vii. Follow-up
- viii. Referral

The subheadings were chosen to start to define the principal activity in each phase. The clarifications in parentheses after the subheadings are to remind us that the processes involved are quite different from a cognitive point of view: interpreting a history is quite different from gathering it, and the implications

⁷ When everything else seems to be failing, however, acting professionally (in the widest sense, as used here) is perhaps the greatest indicator of competence, and represents the most useful thing we can be or do.

are very different for the assessment of competence. Although these subheadings are similar to those found in clinical reasoning skills, they do in fact mainly refer to the phase, and not to the cognitive skill: all of the six skill dimensions could be applicable in any of the eight phases. Having this separate layer of definition helps us to be more precise when planning or doing an assessment of competence. Competent resolution of one problem may require the use of a particular skill in a particular phase of the clinical encounter; the required skill and the pertinent phase may be totally different for another problem.

3. The priority topics:

These topics are only one part, albeit the major one, of the situations found in our domain of competence in family medicine, for the purposes of assessment of competence for certification; the other two parts are the core procedures and the themes for the observable behaviours. The justification for the latter two became most evident, however, after the development of the key features for the priority topics. For this reason this section will first give some details on the topics and their key features. This information will be helpful in understanding the subsequent presentation of the core procedures, the themes, and the observable behaviours.

The survey: The first question of the survey was “*List the most important problems or clinical situations that a newly practicing family physician should be competent to resolve*”. The responses were compiled, retaining the terminology and the level of specificity of the answers wherever possible. Reasonable synonyms were identified and converted to a single form, usually selecting the one that was used most often. This resulted in a total of 99 different topics being listed. The frequencies of the responses for each topic were then calculated. The topics and frequencies are presented on page 24 in tabular form.

Two features of this table are worthy of note:

The table shows a skewed frequency of citation of each topic, with a few topics being cited much more frequently than others. One could probably limit the topics used for assessment to fewer than 99: remember we are mainly interested in the skills used to deal with the problems in each topic, and less interested in the topics themselves. On the other hand, we do need to know that the certificant is competent to deal with a sufficient number of specific problems, as well as having the general skills, so it does not seem unreasonable to use all 99 topics as the domain for assessment. One might also argue that it would be more pertinent to base assessment on topics from the top one-third of the list than on topics from the bottom one-third, as the latter were really not cited very often at all.

The terminology used for the topics is extremely varied: practicing family physicians use an eclectic taxonomy to describe the problems that must be dealt with. There are many diagnoses, symptoms, presentations and tasks; there are also roles (periodic health/screening), groups (immigrants, newborn, elderly), issues (lifestyle), situations (family issues, difficult patients), and even some topics (antibiotics). Most of these terms are, however, quite familiar to most physicians, and will be understood quite readily. There are a few exceptions (e.g., “in child”), but the interpretation given these can be understood by looking at the key features for these topics.

Frequencies of citation by topic, in the initial survey			
TOPICS	rate of citation	TOPICS	rate of citation
Depression	87%	Behavioural problems	10%
Anxiety	87%	Allergy	10%
Substance abuse	60%	Multiple medical problems	9%
Ischemic heart disease	52%	Dizziness	9%
Diabetes	51%	Counselling	9%
Hypertension	50%	Earache	9%
Pregnancy	48%	Grief	8%
Headache	43%	Thyroid	8%
Periodic health/screening	42%	Stroke	8%
Palliative care	40%	Vaginitis	7%
Family issues	37%	Insomnia	7%
Abdominal pain	36%	Infections	7%
Upper respiratory infection	35%	Anemia	6%
Difficult patient	35%	Immunization	6%
Domestic violence	33%	Advanced cardiac life support	6%
Asthma	33%	Gastrointestinal bleeding	5%
Chest pain	32%	Obesity	5%
Dementia	32%	Lacerations	5%
Low-back pain	32%	Eating disorder	5%
Chronic disease	29%	Antibiotics	5%
Elderly	29%	Stress	4%
Contraception	28%	Prostate	4%
Sex	28%	Fracture	4%
Menopause	27%	Newborn	4%
Joint disorder	26%	Immigrant issues	4%
Sexually transmitted infections	24%	Deep venous thrombosis	4%
Well-baby care	24%	Hepatitis	3%
Schizophrenia	23%	Atrial fibrillation	3%
Skin disorder	23%	Parkinsonism	3%
Disability	20%	Learning	3%
Personality disorder	19%	Seizure	3%
Fatigue	18%	Infertility	3%
Lifestyle	18%	Loss of weight	2%
Urinary tract infection	16%	Mental competency	2%
Chronic obstructive pulmonary disease	16%	Osteoporosis	2%
Trauma	16%	Loss of consciousness	2%
Cancer	16%	Red eyes	2%
Vaginal bleeding	15%	Croup	2%
Fever	15%	Poisoning	2%
Smoking cessation	15%	Meningitis	2%
Bad news	14%	Travel medicine	2%
Violent/aggressive patient	14%	Dehydration	1%
Suicide	14%	Diarrhea	1%
Breast lump	14%	Neck pain	1%
Dyspepsia	13%	Crisis	1%
Hyperlipidemia	13%	Dysuria	1%
Pneumonia	13%	Rape/sexual assault	1%
In child	13%	Gender-specific issues	1%
Cough	12%	Epistaxis	1%
Somatization	12%		

Three frequent questions are asked concerning the priority topics, and can be answered here.

1. Is this list valid? Clearly the answer is yes. A second survey was completed with a different representative group of family physicians. The correlation was extremely high between both the topics cited and the relative frequencies of citations.

2. Should other topics be on the list? It is much more important to exclude topics or material that is not demonstrably valid from an evaluation than it is to include all possible valid material. The topics currently on the list have been validated, and they do cover a lot of territory. Demonstrable competence in dealing with these topics will let us infer that the candidate is competent to practice all aspects of family medicine, and that is what evaluation and certification need to do. There is no need to add further topics, although a mechanism should be established to regularly review the list in a structured and valid fashion.

3. Aren't these topics a bit too broad to direct the design of evaluations? This is a correct observation. Evaluation objectives that stop at this level (as many do) are not detailed enough to help us reach the five goals for successful evaluation, as stated earlier. In dealing with these topics in the specific context of family medicine, we need to identify the critical elements, the higher levels of competence, and the skills needed to deal with the situations under each topic. This was first done using the key feature analysis, as described both above and below.

4. Key features:

A key feature analysis identifies two things: it first identifies the specific situations that are most determinant of competence within a topic; it then identifies the critical steps and the critical processes involved in dealing competently with each situation. The key feature is the interaction between the problem and the dimensions of competence necessary to deal with it; the key feature also clarifies, either implicitly or explicitly, both how and why things should be done in a competent fashion for this particular problem.

As a rule, key features are observable actions: They are processes or skills, not simple knowledge. In this respect they fit very well with the current trend toward “competency”-based teaching and assessment. Key features are not only problem or situation specific; they are also discipline specific. By developing the key features specific to each topic we can add the problem-task interaction layer to our definition of competence.

Key features are generated according to clinical experience, not theoretical considerations or literature searches. The number of key features will vary greatly from one problem to another. This number is essentially determined by the various elements considered essential to the competent resolution of that clinical problem. They are determined by a group of practicing peers, using a reflective, iterative process. The approach is intentionally selective; it covers only what is distinctive of competence.

How, then, do these characteristics of key features lend themselves particularly well to the task at hand: assessing competence in family medicine? Key features permit this assessment by promoting validity and reliability in testing. They are valid for two main reasons:

- They are generated by a group of practicing physicians, who base their analysis on the real-life solution of problems in family medicine.
- They identify the higher levels of competence, and these are the levels that distinguish best between the competent and the not-yet-competent practitioner during the certification process.

Key features help to improve reliability by permitting assessment to be selective, concentrating on skills that are likely to discriminate between candidates, and by identifying criteria that can be used to assess performances objectively in test situations. The key features are not themselves test items, but they are signposts that clearly suggest both the content and the format of the test items that would be most appropriate.

In short, key features permit assessment to be concentrated on skills that discriminate between competent and not-yet-competent physicians in a fair, valid, and objective fashion. Experience elsewhere has shown that reliable results can be achieved in a relatively short testing time when test construction is based on key features. Key features are also quite intuitive (although the process of developing them is much less so); for this reason, evaluations based on key features are usually well accepted by all concerned as valid or authentic. In addition, because they reflect the performances related to true competence, key feature-based evaluations tend to stimulate appropriate learning.

The key features for the priority topics: As stated in the initial section of this report, a key feature specifies a particular clinical or situational starting point within a topic, and then identifies a task or action to be done that is critical to the competent resolution of the problem at hand. It specifies, implicitly or explicitly, the skill and the phase dimensions that are involved. It is important to emphasize that as a key feature is being developed there is no preconceived determination of the skills or phases to be included—these are determined by the problem itself, and by the processes required for its competent resolution. Each key feature is therefore a mini-competence, specific to the problem in question, and contains sufficient detail to be used as an evaluation objective that will clearly direct assessment in the intended direction. All the key features, by topic, are listed in Part II.

An assessment based on all the key features for one topic should determine whether competence has been reached for that topic; an assessment based on the key features of all the priority topics should determine whether competence has been achieved for this definition of the domain of competence of family medicine. It is important to know, therefore, whether such an assessment would adequately cover all the dimensions (skills and phases) of competence that we have previously identified as essential. To this end, the last step in the development of every key feature was to code it for the skill and phase dimensions that it assessed, permitting a maximum of two skills and two phases per key feature. These codes are not yet visibly attached to their key features in this current posting, although they are available in working files. The overall compilation is available, however, for all the key features of all 99 priority topics, and is given in the following table.

Descriptive coding of the key features:

A total of 773 key features were generated for the 99 topics, for an average of 7.8 key features per topic. The implications of the relative frequencies in the boxes are discussed below.

Skill dimensions	% of key features	Phase dimension	% of key features		
Patient-centred approach	14%	Hypothesis generation (= early DDx)	22%	Gather = 47%	Diagnose = 63%
Communication skills	4%	History	14%		
Clinical reasoning skills	60%	Physical	4%		
Selectivity	16%	Investigation	7%		
Professionalism	5%	Diagnosis (includes problem identification)	16%	Interpret = 16%	
Psychomotor	1%	Treatment	30%	Manage	Manage
		Follow-up	5%	=	=
		Referral	2%	37%	37%
1080 codes for 773 key features = 1.4 codes/key feature		1128 codes for 773 key features = 1.5 codes/key feature			

Relative percentages for the skill dimensions: These percentages in no way reflect the relative importance of these dimensions; it simply means that key feature analysis of the priority topics identifies many opportunities to assess three of the skill dimensions, but few opportunities for three others, namely communication skills, professionalism, and procedure skills. We must define these latter three by a complementary process and plan their assessment by parallel means.

As already mentioned, a core procedures list (analogous to the priority topics list) was developed, and the general key features for procedure skills were developed. The latter can be used to guide the assessment of competence for the individual procedures. Both the list of core procedures and their general key features are found later in this document.

For professionalism and communication skills, the definitions were completed using our “observable behaviour” approach. The method was briefly introduced earlier in this report, and is expanded upon below under “The themes and observable behaviours”.

One other important point is not evident in this table—even though ample opportunity is provided for the assessment of the patient-centred method, the key features do not provide much specific direction as to how to assess or judge this competence objectively. For this reason we also generated some observable behaviours to help guide the assessment of this dimension. They were derived directly from the excellent already-published material on this dimension, and they are listed with the other evaluation objectives in Part II. If further detail is felt to be necessary, this could be generated *de novo*, but it could also probably be done using the same published material.

Relative percentages for the phase dimension: The three columns show progressive groupings of frequencies in terms of the different clinical tasks, which do require somewhat different cognitive skills. Once again, all the phases are important to overall competence, but we do interpret these figures to indicate the relative importance of the various cognitive skills in dealing with our priority topics in family medicine, in contradistinction to the skill dimensions. We see that the essential skills for the majority of the key features deal with diagnosis (63%), and that nearly half (47%) deal with the active process of gathering the pertinent data to make an adequate diagnosis. Sixteen percent deal with making a diagnosis given certain data, and slightly more than one-third deal with management. These figures are important for two reasons. First, data-gathering skills in this context represent a higher cognitive level of competence than data-interpretation skills or management choices. Second, traditional evaluations have often concentrated more on management, and have neglected the diagnostic phases as being too difficult to evaluate or too basic to be important. The opposite is actually true. The higher cognitive levels of competence (as represented here by diagnostic skills) are much better predictors of overall competence than are the lower levels, such as management choices, which are usually quite problem specific. While competence obviously requires the demonstrated ability to manage many problems in family medicine, it is much more important for us to concentrate our efforts on the higher levels if we wish our evaluation process to be valid and efficient.

Are we sure that these key features are the right ones? Similar questions can be asked about the validity and inclusiveness of the key features as were asked of the topics: Would other groups of physicians develop different key features, and would the inclusion of others improve the evaluation process?

The answer to the first question is yes, and to the second, no. The key features method has been validated elsewhere, and a validation study of our key features showed that a different group of physicians agreed with over 95% of the key features. This other group did suggest some additional key features, but these usually addressed the same concepts with different examples. We therefore are confident that the current key features are more than sufficient, even though they are not absolutely complete. Once again, the establishment of a mechanism for the ongoing review of key features is important, but we do not expect them to change significantly over the short term.

How does one get from key features to evaluations? Key features are the starting point for developing various evaluation instruments or situations, both formal and informal, which can be used throughout a certification process. Key features serve as reference points and signposts throughout all evaluation activities, as they are a major component of our operational definition of competence. They are one of the “keys” to maintaining validity throughout the certification process.

There remain for presentation the three areas not well defined by the key feature analysis: procedure skills, communication skills, and professionalism.

5. The core procedures and their key features:

Procedure skills are a good example of the different levels of competence. As far as an individual procedure is concerned, cognitive skills are generally low level: the technique is learned and practiced and becomes routine. Indications and contraindications, deciding to do or not to do a procedure, and

choosing among several possible approaches to a problem are examples of the higher levels of competence. As a general rule, the individual at the higher levels of competence

- will not perform a procedure at which he or she is not skilled and
- will arrange to learn a procedure that he or she is going to need in his or her particular practice.

This is surely the most important aspect of competence to assess for certification.

Certification cannot, however, limit itself to this level. An independent practice requires a certain level of experiential competence; the practitioner is assumed to have the technical skills to perform a certain number of procedures. The challenge is to define what these essential, or basic, procedures are. Very few (1%) of the key features for the priority topics involved procedure skills in their resolution. It was therefore decided to use a parallel process to better define competence in this skill dimension.

Another working group assumed this task, surveying a group of practicing family physicians to identify and validate a list of core procedures for the start of an independent practice. This group identified 65 core procedures and 15 enhanced procedures. The 65 core procedures are the procedures upon which the assessment of competence will be based—these procedures are listed in Part II. It must be remembered that not only the technical aspects of individual procedures are important. The higher levels of competence will also be assessed, as always, in the context of family medicine: the details of these were defined by a key feature analysis, and these can also be found with the core procedures in Part II.

6. The themes and the observable behaviours:

The other two skill dimensions that were not well defined by the key feature analysis of the priority topics are not the least important—indeed the dimensions of professionalism and communication skills are often neglected as far as rigorous assessment is concerned, even though a lack of competence in these dimensions will have negative effects throughout all the other dimensions as well. These dimensions were defined through a focus-group approach, using information from various sources as inspiration, first developing a series of themes under each dimension. This was followed by a multiple-iteration process to identify behaviours that were indicative of competence, or lack of it, under each theme. The process was continued until satisfaction and saturation were achieved. The behaviours had to be observable (= potentially assessable in a fairly objective fashion); hence the term “observable behaviours”.

This process is analogous to the key feature analysis, but differs in two important ways. First, it is dimension based rather than topic based; we started with the dimension, identifying observable behaviours that are indicative of competence (or lack of it) in that dimension in certain situations in family medicine. Second, whereas the key feature analysis identifies a subset of situations and competencies thought to be indicative of overall competence in the topic in question, the observable behaviour analysis does not attempt to do this: all potentially indicative behaviours are listed, both major and minor, and no particular subset has been identified at this time as being most critical to competence. This could well be a useful exercise at a future date.

The themes of the two dimensions are presented here—the observable behaviours themselves are listed in Part II.

Communication skills:

The themes or skill subsets are as follows. Noteworthy for this dimension is that observable behaviours under each subset were developed twice, once for communication with colleagues, and once for communication with patients. There is considerable overlap, but there are some major differences.

1. Listening skills
2. Language skills
 - i. Verbal
 - ii. Written
 - iii. Charting skills
3. Non-verbal skills
 - i. Expressive
 - ii. Receptive
4. Cultural and age appropriateness
5. Attitudinal

Professionalism:

Knowing how to act professionally and actually doing it in a consistent fashion are not one and the same, and this has major implications for the context of any evaluation. Assessment should probably be based on observations of real-life, real-time behaviours—it does not really lend itself to assessment in simulated situations. In this dimension, competence was defined as being demonstrated by a series of observable behaviours that have been grouped under 12 themes. The themes are listed below. The observable behaviours are listed in Part II.

1. Day-to-day behaviour reassures one that the physician is responsible, reliable, and trustworthy.
2. The physician knows his or her limits of clinical competence and seeks help appropriately.
3. The physician demonstrates a flexible, open-minded approach that is resourceful and deals with uncertainty.
4. The physician evokes confidence without arrogance, and does so even when needing to obtain further information or assistance.
5. The physician demonstrates a caring and compassionate manner.
6. The physician demonstrates respect for patients in all ways, maintains appropriate boundaries, and is committed to patient well-being. This includes time management, availability, and a willingness to assess performance.
7. The physician demonstrates respect for colleagues and team members.
8. Day-to-day behaviour and discussion reassure one that the physician is ethical and honest.

9. The physician practices evidence-based medicine skillfully. This implies not only critical appraisal and information-management capabilities, but incorporates appropriate learning from colleagues and patients.
10. The physician displays a commitment to societal and community well-being.
11. The physician displays a commitment to personal health and seeks balance between personal life and professional responsibilities.
12. The physician demonstrates a mindful approach to practice by maintaining composure/equanimity, even in difficult situations, and by engaging in thoughtful dialogue about values and motives.

IV. Using the evaluation objectives

The main target audience of this section at this time consists of trainees and their preceptors, and the use of the evaluation objectives during training and daily supervision. They are already being used in other contexts, but these are dealt with elsewhere.

The first piece of advice may seem paradoxical, but should improve the chances of getting started and eventually using the evaluation objectives to their full potential:

- 1) ***Do not read the evaluation objectives in any great detail:*** Both preceptors and trainees should start by getting into the habit of using some type of field note after most supervised clinical encounters to stimulate discussion, identify the critical steps in the resolution (or not) of the situation in question, reflect on the performance with respect to these, and document one or two points that seem to be most useful. Start to concentrate as much or more on the process (why and how) as on the results, paying particular attention to diagnostic reasoning and decision making. Many of these steps are already being done, but often without an awareness of the cognitive processes involved, and without always being able to articulate the judgments, reflection, and feedback that will be most useful in moving toward competence. Such a repetitive analytical approach will gradually become intuitive, for both trainees and preceptors. This would now be the time, if it has not already been done, to get to know the evaluation objectives in detail.
- 2) ***Consult the evaluation objectives to help to articulate the analysis, reflection, and feedback on clinical performances, either by supervision or by self-assessment:*** Much of the difficulty experienced with in-training evaluations comes from not being able to articulate clearly and objectively why a certain performance does or does not meet the standards of competence, and what might need to be changed to reach competence. The “does not” situation is particularly problematic, as the result is often a vague response from a preceptor, or no comment and no useful documentation at all of a series of subpar performances, with no useful constructive feedback for change. Similarly, the apparently competent performance often deserves a more insightful analysis and feedback, so that any continuing minor weaknesses can be identified and corrected, or if all truly seems well, then future teaching and learning can be concentrated on other areas.

The evaluation objectives provide this articulation for most of the situations that will be met during training in family medicine. They also depersonalize, in a useful way, the judgments and feedback, making them easier to accept by providing clear reference points and justified descriptions of competence in a pragmatic fashion.

- 3) Use the evaluation objectives to help to structure, organize, and document progress toward competence:** The evaluation objectives provide a frame of reference and clear guideposts for achieving and demonstrating competence in family medicine. They are equally applicable for regular unstructured daily clinical supervision, for planned direct observations, or for any structured assessment activity. They are particularly useful for a trainee in some difficulty—the areas of weakness can be better defined, thus permitting specific educational prescriptions and further assessment in these specific areas as necessary.

Some may prefer more structured field notes, even for the unstructured supervisions. The components of the evaluation objectives may be used to develop these: the skill dimensions, the phase of the clinical encounter, the priority topics, and the procedures. Whatever structure is used, the feedback and documentation should be inspired by the key features or the observable behaviours. It is also important to remember that for most preceptor-trainee clinical interactions, the analysis and feedback should be limited to one or two specific areas or points.

The evaluation objectives are designed for an individual, but can also obviously be used to plan group-learning activities—topics can be reviewed through the key features. Prototypical critical incidents tend to be identified, so they can be discussed ahead of time—wisdom and experience cannot really be taught, but some of the lessons learned can be passed on ahead of time.

Future developments may include topic- and dimension-specific field notes, perhaps computer generated on demand. Electronic filing and compilation would permit ready revision of progress and help with planning of future training. There is perhaps no limit at this time on how the evaluation objectives might be used—it is hoped that experiences and new ideas will be shared, so that all may benefit.

- 4) Other uses of the evaluation objectives:** The evaluation objectives are already being used to design and develop the certification examinations. They could also be used in several other ways.

Levels of competence, core competence: The expected performances at certain levels of training can be defined using the evaluation objectives. This would be useful for deciding on promotion, equivalence of previous training, needs for additional training, etc.

Curriculum design: Curriculum design is a complex issue, with many limiting factors. The measure of the pertinence of an activity should, however, no longer be its name and its duration. The measure should be the contribution of the activity to the progressive acquisition of competencies, and the degree to which it can demonstrate that it is fulfilling this objective. The evaluation objectives provide a pragmatic reference tool to which a curriculum and its parts may be compared and against which they may be judged. They are structured so that the comparisons should be quite straightforward and the judgments transparent, leading to changes within an existing activity or to

a new activity. In this way, they can be used for continuous quality improvement and help to ensure that our curricula in family medicine evolve in a dynamic fashion as we strive to make sure that our training programs promote, in an efficient and predictable manner, the acquisition of all the competencies required of the family physician in today's society.

Defining the specialty of family medicine, with comments on postgraduate and undergraduate training: A medical specialty or discipline is defined by many characteristics, and may include many variants or even subspecialties. There usually is, however, an identifiable central competence common to all these variants and subspecialties within one specialty. This situation applies to family medicine, and the evaluation objectives do represent an operational definition of this central competence, one that should be common to all family physicians. As such they can be used to determine the resources needed to provide the necessary common training and assessment of competence, and to justify these needs to academic institutions, licensing bodies, provincial governments, and society at large. This competency-based definition of family medicine is quite transparent, and the link between the desired result (competent family physicians) and the postgraduate training required (in which clinical milieu, with which kind of preceptors, to what level of desired competence) should be just as transparent. It is also quite detailed and factual or objective, so both inadvertent redundancies and gaps can be identified, and specific limited corrective modifications can be made, without changing the whole curriculum.

This competency-based definition also permits those involved with undergraduate training to look ahead to what competencies are required for family medicine. Curricular modifications at this level may then better prepare students for postgraduate training in family medicine, and they may well be able to justify even more significant curricular changes to achieve objectives that move toward competencies common to more than one specialty. Our evaluation objectives define the nature of competence at the point of entry into independent practice in family medicine. Nothing in our definition states, however, when these competencies must be acquired or in what order. This is more properly the domain of the educators, those who look after the training at all levels, by designing curricula and supervising activities, and by assessing, on a regular basis, progress toward the desired competencies and overall competence. Once again, the evaluation objectives are an essential reference point and a useful tool for achieving this result in family medicine.

End of Part I