



## CONTENT DEVELOPMENT PROCESS FOR THE CERTIFICATION EXAMINATIONS: A DETAILED REVIEW

This document provides a detailed description of the College of Massage Therapists of Ontario's process for developing the Certification Examinations required for registration as a Registered Massage Therapist/Massage Therapist. The College is committed to excellence in the creation and execution of our Certification Examinations. Strict adherence to international testing standards ensures the development of standardized, fair, valid, reliable and defensible examinations.

### Why does the College of Massage Therapists of Ontario conduct Certification Examinations?

The goal of conducting certification examinations is to protect the public by evaluating a candidate's level of proficiency against the identified entry-to-practice standard of competence. The Certification Examinations developed and administered by the College of Massage Therapists of Ontario (CMTO or the College) the Multiple Choice Questions (MCQ) examination and the Objectively Structured Clinical Evaluation (OSCE) examination.

Massage Therapy is a regulated health profession in Ontario. The College of Massage Therapists of Ontario (CMTO) is the regulatory body that provides oversight and guidance to registrants of the profession. The work of the College is subject to several pieces of legislation, most notably the *Regulated Health Professions Act (RHPA), 1991* and the *Massage Therapy Act (MTA), 1991*. With regard to the requirements for registration, the *RHPA* states that each regulated health profession in Ontario must "develop, establish and maintain standards of qualification for persons to be issued certificates of registration." With regard to certification examinations, the *MTA* states: "in setting the examinations to be taken by applicants to the College for registration, the College shall specify the general areas of competency to be examined and shall ensure that the examinations provide a reliable and valid measure of a candidate's competency in knowledge, skills and ability for the practice of massage therapy in Ontario."

### Who is on the team that develops the content for the Certification Examinations?

The content development team for the Certification Examinations is composed of the College's Content Specialist and various Subject Matter Experts (SMEs). The team also includes psychometric staff members from Schroeder Measurement Technologies, Inc. (SMT), a professional testing firm contracted by the College to assist with the development and administration of the Certification Examinations.

The Content Specialist and the SMEs are Registered Massage Therapists (RMTs) in good standing with the College. Typically, these individuals have several of the following qualifications:

- a) Extensive clinical experience;
- b) Relevant additional post-secondary education;
- c) Abundant continuing education in Massage Therapy;
- d) Prior related teaching experience;
- e) Test development experience; and
- f) Understanding of the function of the College and the examinations demonstrated through prior roles with the College (e.g., having served as a peer assessor, examiner, etc.).

### How does the College keep the examination content secure?

Keeping the examination content secure is extremely important. Security policies - including examination candidate requirements and item (question) bank protection and access - are strictly monitored and enforced. There is careful screening of examination staff and those involved in examination standard setting. In addition, statistical analysis of item performance is conducted regularly to identify possible examination security breaches.

However, in order to demonstrate that the Certification Examinations are developed and administered in an objective and fair manner, there needs to be a certain amount of transparency regarding examination content and delivery. Information about the development process is openly shared with Massage Therapy programs, instructors, RMT candidates and the public as much as is possible without compromising examination security.

### The College has an approved list of references used for item (question) development. How is the list generated?

The approved Massage Therapy programs in Ontario are key contributors to the list of approved references. Every three to five years, CMTO conducts a survey of these programs in order to identify the references these programs are using to teach their Massage Therapy curriculum. This information helps generate an updated approved list of references.

References that two or more programs are using are automatically considered for inclusion on the approved list of references. In addition, the Content Specialist and the Subject Matter Experts (SMEs) consider the following when reviewing a reference:

- a) The quality of the referencing;
- b) Confirmation that the text is evidence based;
- c) The expertise of the author(s); and
- d) If the reference covers content that is not sufficiently covered by another approved reference.

If more than one edition of a book is being used, only the most recent edition is included on the approved list of references. If only one program uses a given reference, then the Content Specialist and SMEs review the reference using the criteria noted above to determine if it should be included on the list. In the event that a specific exam content area is identified that does not have a reference on the

approved list, the Content Specialist and SMEs will select an appropriate reference for that content area and include it on an updated version of the approved list of references.

### Are Massage Therapy programs required to teach from this list of references?

It is important to note that Massage Therapy programs are not required to teach from materials on the approved list of references. Programs are free to select their own references to support the delivery of their curriculum. The goal of developing and publishing the approved list of references is to create transparency with respect to the references that are used to support the development of test items.

### What are the steps that the College follows to develop defensible Certification Examinations?

The six main steps involved in Certification Examination development are:

1. Content Outline Development
2. Item Writing
3. Item Review and Translation
4. Test Development
5. Standard Setting/Score Scaling/Scoring and Reporting
6. Examination and Test Question Statistical Analysis, Review and Candidate Feedback

These six steps are described in detail below.

#### Step 1 – Content Outline Development

The Inter-jurisdictional Practice Competencies and Performance Indicators for Massage Therapists at Entry-to-Practice are national standards describing Massage Therapy practice in Canada. CMTO performed an extensive research study to ensure that the IJC recommendations for tasks that should be included in the MCQ and OSCE examinations were appropriate for use in Ontario. This study and its findings were presented to Ontario's approved Massage Therapy programs and other interested parties in a webinar held in November 2014..

The IJC Standards were presented as a working document; they are intended as a work in progress. The purpose of the research was to ensure that all tasks and subtasks recommended for inclusion on CMTO's MCQ and/or OSCE exams reflect Massage Therapy practice in Ontario. The tasks must also be easily referenced, reasonable and important to test, as well as assessable in a fair and psychometrically sound manner. Our research identified some sub-content areas that could not be referenced, were not feasible to test, or were tested in more than one area of the outline. Those tasks were eliminated from the CMTO content outlines.

Overall, the CMTO content outline is less detailed than the IJC Standards, except for the task related to provincial rules and regulations. The addition of the provincial rules and regulations was an anticipated difference between the IJC Standards and CMTO's exam content. However, this content area reflects

CMTO's responsibility to ensure that its registrants demonstrate competency in the laws, policies and procedures that govern Massage Therapy practice in our province.

### Step 2 – Item Writing

Once the CMTO content outlines (MCQ and OSCE) have been established, test items are developed. Each test item (i.e. each MCQ question and each individual task in an OSCE case) is 'linked' to a specific content area on the content outline. MCQ items and OSCE scenarios are reviewed regularly and are updated and retired as needed to keep the banks 'fresh' and ensure the items are content relevant. New OSCE and MCQ items are continuously being written in order to provide greater flexibility for test development and avoid overexposure of items.

Item development is a collaborative effort, using the expertise of the College's Content Specialist, OSCE and MCQ SMEs, and the psychometric consultants at SMT. First, a psychometrician trains item writers how to properly write new items - e.g., no tricky or confusing formats, no humour or slang, no idioms, elimination of bias, appropriate language level, etc. The goal of the training is to identify high-functioning item formats, train the item writers on what makes a strong test item, and review various item types. The Content Specialist and the SMEs are then responsible for writing new examination items that are clear and unambiguous, properly referenced, psychometrically sound, free from bias, clinically relevant and linked to a specific content area on the outline of the examination content.

Writing an item for the MCQ is fairly straightforward. Developing a case for an OSCE station includes the creation of candidate instructions (i.e. the stem), standardized client instructions, and marking criteria for the examiner. Specific and detailed instructions ensure that client performance is standardized and that the examiner's marking is based on specific and objective 'yes' or 'no' criteria for each task.

Each test item must be supported by a minimum of two approved references. Some exceptions may apply for content areas such as legislation, or CMTO Standards of Practice and policies, which may only have one reference. If a topic is covered by more than two references, then all references are reviewed to ensure that the correct answer is unequivocally supported.

### Step 3 – Item Review and Translation

The Content Specialist, SMEs and SMT psychometric staff review the content of each newly written item to ensure that it is clear and unambiguous, properly referenced, psychometrically sound, free from bias, clinically relevant, and linked to a specific content area on the outline of the examination content.

Approved items are then translated into French by a Certified French translator experienced with translation for Massage Therapy. Then a bilingual SME reviews the translation to ensure it is appropriate within a Massage Therapy context. Finally, a pair of bilingual SMEs reviews the translation prior to approval for inclusion on the examination. The College has developed a French lexicon that is used to ensure consistency of translation across time. This lexicon is available on the CMTO website.

### **MCQ Examination**

The MCQ examination consists of 150 questions. Of these, 125 are scored questions that form the basis of the candidate's result. The remaining 25 questions are 'pretest' questions, which are newly written questions that are being tested for validity and reliability. A statistical analysis of candidate performance on the pretest items is used to determine if a newly written item is appropriate to be included as a scored item on a future exam. The length of time given to candidates to complete the MCQ exam includes sufficient time to complete the pretest questions.

The examination is administered four times per year using a computer-based testing format. For each administration, a new form of the examination is developed, which means that a new set of questions makes up the exam. A statistical method, referred to as equating, is used to ensure that candidates taking a new form of the examination will be evaluated using the same standard as was in place for prior forms of the examination.

Examination forms are assembled by psychometric experts. All questions that are used to determine a candidate's score on any given examination form have been pre-tested, and candidates' comments are reviewed and considered.

The minimum passing score for the examination is established by a panel of SMEs based upon considerations such as the relevance of each question to competent practice, the difficulty of each question, and the ability of the question to differentiate between the competent and non-competent candidate at the entry-to-practice level.

### **OSCE Examination**

Each year, a new set of OSCE examinations is developed. For each of the seven stations, six cases are selected for inclusion in the OSCE (i.e. a total of 42 cases). Both new and repeat cases are used each year. The examination is reviewed to ensure that it matches content outline requirements. Cases are randomly assigned to scheduled exam days in order to avoid overexposure. Given the matrix of seven stations, each with six scenarios, there are a total of 279,936 different possible examination combinations. Computerized score sheets are generated for each case to enable computerized scoring on exam days.

Training for OSCE examiners and clients is conducted over several days prior to the first OSCE administration each year. Examiners and clients are trained on their respective standardized roles using the OSCE case material.

OSCE candidates are observed by two examiners in each of the seven stations. Each examiner determines if the candidate has, or has not, performed the behavioural criteria associated with that station.

## Step 5 – Standard Setting/Score Scaling/Scoring and Reporting

Standard setting refers to establishing passing points for examinations (the score needed to pass). This must be done in a standardized, defensible manner.

As mentioned earlier, the goal of the Certification Examinations is to identify candidates who demonstrate minimum competency for entry-level practice. Minimum competency represents a level of proficiency that enables protection of the public and maintenance of professional standards. By establishing the criteria required of the minimally competent entry-level practitioner, and judging candidate performance against those criteria, we have confidence that all candidates who demonstrate the required minimum competencies will pass, and those candidates who do not demonstrate minimum competency will fail.

For the MCQ, the College uses a standard setting approach referred to as the Angoff Method, which is the most widely used and universally recognized method within the international professional testing industry. For the OSCE, a different approach is used: the Bookmark Method. Both the Angoff and Bookmark methods rely on the judgment of practicing RMTs to define minimum competence. The RMTs recruited to participate on a standard setting panel are in good standing with the College and, as a group, they reflect the profession in terms of diversity of practice, education, experience, training, age, gender, ethnicity and geographic practice settings. Diversity and expertise provides the foundation for the establishment of an appropriate passing standard.

The Angoff Method requires each of the RMTs on the panel to individually define minimum competence as it relates to each exam item. Items that are deemed to be an essential element of minimal competence are given more weight in the determination of the minimum passing score than items that do not reflect essential elements of minimal competence.

A meeting to set standards begins by identifying the attributes of a minimally competent entry-level practitioner. Discussion focuses on the knowledge, skills and abilities that are required to practise safely while serving and protecting the public. The opinions of the RMTs (the weights mentioned above) for each examination question are discussed by the RMT panel and a minimum passing score is determined.

The Bookmark Method used for the OSCE follows a different approach. For the purposes of standard setting, the behavioural criteria are ranked in the order of actual difficulty (arranging them from easiest to most difficult task). The RMT panel determines which of the behavioural criteria 'must' be performed by the minimally competent practitioner, and which 'may' be performed by the minimally competent practitioner. Finally, the panel works to reach consensus on the specific point on the list that represents the passing score. The passing score is set when the expectation changes from 'must be performed' to 'may be performed' on the list of ranked behavioural criteria.

Each examination form is unique because the forms consist of different questions and cases. As a result, it is reasonable to assume that some examination forms may be slightly more difficult than others. This means that when the standard-setting process is complete, a passing score for demonstrating minimum competence on a 'difficult' exam could be 68, whereas a passing score for demonstrating the same level of minimum competence on an 'easy' exam could be 72. In order to provide consistent reporting, CMTO reports results using a 'scaled score' where the raw score data are converted to eliminate the effect of

any differences in test difficulty. Using this conversion method, CMTO is able to keep the passing score for the examinations at 70.

## Step 6 - Statistical Analysis, Review and Feedback

CMTO's Certification Examinations are constantly reviewed to ensure that they are continuing to serve as a fair and valid measure of minimum competence required for an RMT in Ontario.

For the MCQ, live and pretest item performance is statistically analyzed on an ongoing basis. Items that are too easy or too difficult, or are not differentiating among candidates of varying abilities, are highlighted for review by the MCQ SME team. Pre-test items that have been sufficiently tested are statistically reviewed to determine if they are appropriate for inclusion in the live examination.

Candidates' comments, which are collected on individual items during test taking, are also reviewed to identify potentially problematic items. Items may be left unchanged, permanently retired or edited depending on the specific issue(s) identified. Edited items are considered new items and moved back into the pre-testing stage. Periodically, a review of the entire test bank is undertaken to ensure that the bank represents current practice, adequate referencing and general suitability in a consistent manner. Candidates complete an exit survey at the end of the MCQ, which is used to help ensure overall quality control of the examination process.

For the OSCE, custom software has been developed to enable real-time statistical monitoring of essential examination components. These include the consistency of marking decisions amongst examiners (inter-rater reliability); examiner harshness; pass rates for individual OSCE scenarios and stations; overall ease or difficulty of individual tasks; and discrimination of individual tasks among candidates of varying abilities. Examiner retraining is provided in cases where inter-rater reliability or rater harshness is not acceptable. Daily evaluation forms for OSCE staff are also used to collect feedback and support retraining initiatives, when required. Pass rates for individual OSCE cases that differ from other cases at a statistically significant level (i.e. are much easier or harder than the average case) are reviewed to ensure there is no confusion or fault. If deemed appropriate, cases are modified and/or new cut score studies are undertaken. Individual tasks that are very easy, very difficult or do not show the difference between the minimally competent candidate and the not minimally competent candidate are also reviewed. Decisions may be made to edit, delete or leave a task unchanged, depending on the specific issue(s) identified. Typically, alterations in the examination are made at the end of an OSCE season.

Generally, official OSCE results will be e-mailed to candidates within six (6) weeks after the date of their OSCE examination. However, for candidates who take the OSCE during the first month it is offered each year, result notifications may be issued up to 12 weeks after the examination date. This additional time is required in order to obtain enough statistical information to ensure the validity and fairness of the OSCE scoring and reporting process.

The data obtained in the first weeks of the OSCE administration are compiled and analyzed by CMTO in consultation with Schroeder Measurement Technologies, CMTO's psychometric testing firm. Once this analysis is complete, official scores can then be released.

Transparency is a cornerstone of CMTO's Certification Examinations. Candidates who fail the examinations receive detailed information concerning their performance, outlining areas of strength and weakness designed to help in future study and success. Also, Massage Therapy programs are encouraged to direct questions about the examinations to the CMTO Content Specialist at any time. Each year, Massage Therapy education programs are provided with individualized reports that outline how their students performed on the MCQ and OSCE certification examinations. Areas of strength and weakness based on the examination content are highlighted by comparing individual program performance to the performance of all programs combined. Finally, OSCE and MCQ pass rates are published each year in the College newsletter, *TouchPoint*.