

## **HISTORICAL FORWARDS TO CCPM WRITTEN EXAMS**

Since the initial version of the written exam, forwards have been frequently used by the Chief Examiner to briefly explain new content or changes to the CCPM written exam. Up until this year, these have been simply added to the existing forwards. However, as of 2014 the forwards were running to a cumbersome 12 pages. It was felt that the past forwards may be of historical interest to some, as they record the evolution of the written exam since 1984. They are therefore presented in this document.

## **FOREWORD TO THE NINTH EDITION VERSION 9.2**

Edition 9.2 includes a significant update to the radiation oncology subspecialty exam. The use of sketches or hand drawn diagrams/figures is reduced (but not removed entirely). An attempt was made to remove redundant questions and also dated questions. When possible wording was improved to add description and detail, or remove ambiguity. A few new questions were added. In the Diagnostic Radiology subspecialty, several dated questions were removed and wording in a few others was improved. Also note that I removed the forewards from earlier exam editions as they were becoming too cumbersome to keep in this document. For those of you with an historical interest, I have placed the previous forewards in a document available on the CCPM website.

There are also two documents currently available on the CCPM website that should be useful to help prepare for this exam. One document is a 'preparation guide' that provides general advice to candidates on how to prepare for the Membership exam. The second document is a reading syllabus for Part I of the exam which is the general medical physics knowledge portion meant to assess the candidates general knowledge across all subspecialties. These documents were conceived and developed based on feedback from recent Membership candidates over the last few years.

I would like to thank Harry Ingleby, Dan Rickey, Idris El Bakri and Jeffrey Frimeth for their work with the Diagnostic Radiology question bank, to Samantha Eustace and Glenn Wells for their work on the Nuclear Medicine question bank, to Ian Cameron for work on the Magnetic Resonance Imaging question bank, and to Ryan Rivest, Eric Van Uytven, Renée-Xavière Larouche, Clément Arsenault, Horacio Patrocinio, and Wendy Smith for their work on the Radiation Oncology question bank.

Boyd McCurdy, Ph.D., FCCPM  
Chief Examiner, CCPM  
CancerCare Manitoba  
Winnipeg, MB

September 2014

## **FOREWORD TO THE NINTH EDITION VERSION 9.1**

Edition 9.1 contains only minor changes and updates to the radiation oncology subspecialty exam. Of note, the use of ICRP Publication 103 replaces the older ICRP Publication 60. Some questions have revised wording in an attempt to clarify the intent, and several typographical errors have been corrected. Although not specifically related to the exam questions, I would like to draw your attention to two new documents that will be available on the CCPM website shortly (around mid-October). One document is a 'preparation guide' that is intended to provide general advice to candidates on how to prepare for the Membership exam. The second document is a reading syllabus for Part I of the exam which is the general medical physics knowledge portion meant to assess the candidates general knowledge across all subspecialties. These documents were conceived and developed based on feedback from recent Membership candidates.

The College would like to extend its thanks to Harry Ingleby, Dan Rickey, and Idris El Bakri for their work with the Diagnostic Radiology question bank, to Samantha Eustace and Glenn Wells for their work on the Nuclear Medicine question bank, and to Charles Schroeder, Renée-Xavière Larouche and Esmaeel Ghasroddashti for their work on the Radiation Oncology question bank.

Boyd McCurdy, Ph.D., FCCPM     September 2013  
Chief Examiner, CCPM  
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## **FOREWORD TO THE NINTH EDITION VERSION 9.0**

The Membership examination is the process by which the Canadian College of Physicists in Medicine (CCPM) ensures competency of professional medical physicists. The Membership exam process consists of both a written and an oral component, specific to the four main sub-specialties: Radiation Oncology Physics, Diagnostic Radiology Physics, Nuclear Medicine Physics and Magnetic Resonance Imaging Physics. The written component is divided into four Parts, with Part I being themed as ‘general knowledge’ and Part II being themed ‘safety’, both parts delivered in the multiple choice format. Questions in Parts I and II are not known to the candidates prior to the exam. Parts III and IV consist of a bank of long answer questions provided to the candidates prior to the exam.

The CCPM is constantly working on improving and updating these questions to keep them relevant and appropriate in a highly technical field where clinical activities and standards evolve rapidly. Edition 9.0 represents an effort to modernize some out-of-date technical wording for all the sub-specialties, as well as update questions (mainly Diagnostic Radiology and Nuclear Medicine) and provide a few new questions on current topics (mainly Radiation Oncology).

The College would like to extend its thanks to Harry Ingleby and Dan Rickey for their work with the Diagnostic Radiology question bank, and Samantha Eustace and Glenn Wells for their work on the Nuclear Medicine question bank, and to Robert Corns, Keith Nakonechny, and Renée-Xavière Larouche for their work on the Radiation Oncology question bank.

Boyd McCurdy, Ph.D., FCCPM     September 2012  
Chief Examiner, CCPM  
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## **FOREWORD TO THE EIGHTH EDITION VERSION 8.2**

Edition 8.2 represents a continuation of work started in Edition 8.0. The College is splitting up multi-part thematic questions in Parts III and IV of the exam into individual questions. Radiation Oncology was the first discipline to have this change. This task is now completed for all four specialties.

In addition to reformatting the questions into individual questions, substantial efforts are being made to modernizing questions, editing questions, and creating new questions. The College would like to extend its thanks to Peter Dunscombe for his work on the Radiation Oncology question bank, Glenn Wells for his work on the Nuclear Medicine question bank and to Boyd McCurdy, Harry Ingleby, Dan Rickey, and Idris Elbakri for their work on the Diagnostic Radiology Imaging question bank.

Robert Corns, Ph.D., FCCPM      September 2011  
Chief Examiner, CCPM  
BC Cancer Agency, Fraser Valley Centre  
Surrey, BC

## **FOREWORD TO THE EIGHTH EDITION VERSION 8.1**

Edition 8.1 represents a continuation of work started in Edition 8.0. The College is splitting up multi-part thematic questions in Parts III and IV of the exam into individual questions. Radiation Oncology was the first discipline to have this change. This task is now completed for the Magnetic Resonance Imaging Part III and Part IV question bank, which now consists of 71 and 36 questions, respectively and for the Nuclear Medicine Part III question bank, which now consists of 91 individual questions.

Still outstanding in this project is Part IV of the Nuclear Medicine exam and Parts III and IV of the Diagnostic Radiological Physics exam. For this year these questions banks will remain as multi-part thematic questions.

In addition to reformatting the questions into individual questions, substantial efforts are being made to modernizing questions, editing questions, and creating new questions. The College would like to extend its thanks to

Nicola DeZanche, Atiyah Yahya and Keith Wachowicz for their work on the Magnetic Resonance Imaging question bank; to Glenn Wells for his work on the Nuclear Medicine question bank; to Boyd McCurdy for his work on the Radiation Oncology question bank; and to Harry Ingleby, Dan Rickey, and Idris Elbakri for their work on the Diagnostic Radiology question bank.

Robert Corns, Ph.D., FCCPM      September 2010  
Chief Examiner, CCPM  
BC Cancer Agency, Fraser Valley Centre  
Surrey, BC

## FOREWORD TO THE EIGHTH EDITION

The Canadian College of Physicists in Medicine (CCPM) certifies competency in medical physics through its Membership examination process. The Membership exam consists of both a written and an oral component, and certification for competency in medical physics is given in four sub-specialties: Radiation Oncology Physics, Diagnostic Radiological Physics, Nuclear Medicine Physics and Magnetic Resonance Imaging Physics. The written exam consists of four parts. All four parts are written on the same day. Parts I and II are written in the morning in a two and a half hour sitting, which is followed by a lunch break. Parts III and IV are given after the lunch break in another two and a half hour sitting.

Part I consists of short answer questions covering general medical physics as well as clinical anatomy and biological science relevant to clinical medical physics practice. Applicants from all sub-specialties write the same Part I examination. The time allocated for Part I is one and a half hours.

Part II consists of short answer questions to test the applicant's knowledge of radiation safety and protection. The time allocated for Part II is one hour. Applicants from Oncology Physics, Diagnostic Radiological Physics and Nuclear Medicine Physics write the same Part II exam whereas applicants from Magnetic Resonance Imaging Physics write a Part II exam tailored to the safety considerations important in Magnetic Resonance Imaging.

Parts III and IV are based upon the question bank specific to the applicant's sub-specialty. This question bank is available to the applicant by the first of October prior to the examination. The question bank will be posted on the CCPM website. This examination booklet covers the question bank used in Parts III and IV. Part III contains questions specific to the sub-specialty and Part IV contains questions that cover more general areas of the sub-specialty.

In 2005, the CCPM decided to reformat the question banks for Parts III and IV of the Radiation Oncology Physics sub-specialty. Edition 7 of the examination booklet reflects these revisions and Part III is reformatted into eighty-three questions while Part IV is reformatted into forty questions. Edition 8 continues this work and this year we reformatted Part III of the Magnetic Resonance Imaging Physics' question bank into seventy-one equally weighted questions. It is the intent of the CCPM to eventually reformat the all Part III and Part IV question banks into individual questions for each discipline.

While the seventh and eighth editions represent a major reorganization and updating of questions in Parts III and IV, they in fact build upon the work of their predecessors. In particular, I would like to acknowledge the work of previous Chief Examiners, namely, Margaret Young, Ervin Podgorsak, Mike Bronskill, Jake Van Dyk, Terry Peters, Gino Fallone, Ting-Yim Lee, Katharina Sixel and Michael Evans. Other individuals who assisted with previous versions are also credited in the appropriate foreword. The updating and reformatting of the Magnetic Resonance Imaging Physics sub-specialty was accomplished through the efforts of many people. I would like to thank Nicola DeZanche, Atiyah Yahya, Keith Wachowicz and Sherry Connors for their valuable input into the 8th edition of the question bank.

Robert Corns, Ph.D., FCCPM      September 2009  
Chief Examiner, CCPM  
BC Cancer Agency, Fraser Valley Centre  
Surrey, BC

## FOREWORD TO THE SEVENTH EDITION

The Canadian College of Physicists in Medicine (CCPM) certifies competency in medical physics through its Membership examination process. The Membership exam consists of both a written and an oral component, and certification for competency in medical physics is given in four sub-specialties: namely Radiation Oncology Physics, Diagnostic Radiological Physics, Nuclear Medicine Physics and Magnetic Resonance Imaging Physics.

During the 2005 CCPM annual general meeting in Hamilton, Ontario, the membership requested a revision of the examination booklet with particular emphasis on the questions in Parts III and IV of the Radiation Oncology Physics subspecialty. This new edition (Edition 7) of the examination booklet reflects these revisions. In particular the Part III and IV question banks of Radiation Oncology Physics have been reviewed and updated. In addition, Parts III and IV have been reformatted to contain 83 questions (Part III) and 40 questions (Part IV) respectively. The content and breadth of the new format is similar to the original question set written by Ervin Podgorsak and in use since 1985, however the new format will allow for a more diverse set of questions to be chosen for the written examination.

The written component of the Membership exam consists of four Parts, and the exam is administered during a single day. Parts I and II are given first in a 2.5 hour sitting followed by a lunch break. Parts III and IV are given after the lunch break in a 2.5 hour sitting so that the total writing time during the examination day is 5 hours.

Part I consists of short answer questions (no choice) covering general medical physics as well as clinical anatomy and biological science relevant to clinical medical physics practice. Applicants from all sub-specialties write the same Part I examination and the time allowed for Part I is 1.5 hours.

Part II consists of short answer questions (no choice) to test the applicant's knowledge of radiation safety and protection. Applicants from the three ionising radiation sub-specialties write the same Part II examination, whereas a different Part II examination is supplied for the Magnetic Resonance Imaging specialty. The time allowed for Part II is 1 hour.

Parts III and IV are based on the question bank specific to the applicant's sub-specialty and available to the applicant by the first of October prior to the examination. The question bank will be posted on the CCPM web site, and this examination booklet covers the question bank used for Parts III and IV. Part III contains questions specific to the sub-specialty, and Part IV contains questions that cover more general areas of the sub-specialty.

For the Diagnostic Radiological Physics, Nuclear Medicine Physics and Magnetic Resonance Imaging Physics sub specialties, the Part III question bank contains 20 questions and the Part IV question bank contains 10 questions. For the Membership exam, one question from Part III and one question from Part IV are chosen at random. The total time allowed to complete both the Part III and Part IV questions is 2.5 hours.

For the Radiation Oncology Physics sub-specialty the Part III question bank contains 83 questions and the Part IV question bank contains 40 questions. For the Membership exam, five questions from Part III and five questions from Part IV are chosen at random. Each question is equally weighted and therefore counts for 20% of the appropriate Part mark. Where the question contains two or more parts, these parts are also equally weighted unless otherwise indicated. The total time allowed to complete both the Part III and Part IV questions is 2.5 hours.

While this seventh edition represents a major reorganization and updating of Parts III and IV of the Radiation Oncology sub-specialties, it in fact only builds upon the work of my predecessors. In particular I would like to acknowledge the work of the previous Chief Examiners, namely Margaret Young, Ervin Podgorsak, Mike Bronskill, Jake Van Dyk, Terry Peters, Gino Fallone, Ting-Yim Lee and Katharina Sixel. Other individuals who assisted with previous versions are also credited in the appropriate edition foreword. The updating and reformatting of the Radiation Oncology subspecialty was accomplished with the help of many people, and for their efforts I would like to thank Brenda Clark, John Schreiner, Tom Farrell, Boyd McCurdy, Ian Kay, Ervin Podgorsak, Robert Corns, and in particular Katharina Sixel.

Michael D.C. Evans, M. Sc., FCCPM  
Chief Examiner, CCPM  
McGill University Health Centre  
Montreal, Québec.

September 2006

## **FORWARD TO EDITION 6.2**

A new edition number, Edition 6.2, is posted on the COMP/CCPM website as of October 1, 2003. There are no changes to the question bank. However, the Registrar is now Dr. Wayne Beckham, instigating an update to this document. Furthermore, the edition number has been unified amongst all subspecialties. Regarding exam format, details are posted in a separate document on the website. Please refer to it for specific instructions and information. This examination booklet covers the question bank used for Sections III and IV of the written Membership exam.

Katharina E. Sixel, PhD, FCCPM  
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## **FORWARD TO EDITION 6.1**

Edition 6.1 represents a minor revision from the previously published sixth edition. One ambiguity in question III.7 has been corrected, and question III.19 has been substantially altered (Radiation Oncology section). The College Board decided that these changes did not warrant a new edition number. However, to allow for incremental improvements to the exam questions, we have instigated the release of minor version changes. Please refer to the full Forward to the Sixth Edition below for a more complete description of the written exam.

Katharina E. Sixel, PhD, FCCPM  
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## **FOREWORD TO THE SIXTH EDITION**

This sixth edition is the result of a review to update questions related to the Radiation Oncology Specialty in Medical Physics. Some new questions were also added in this area to keep abreast of new developments.

The Canadian College of Physicists in Medicine certifies competency in Medical Physics through its Membership examination. Certification for competency in Medical Physics is given in four sub-specialties: Therapeutic Radiological (Radiation Oncology) Physics, Diagnostic Radiological Physics, Nuclear Medicine Physics, and Magnetic Resonance Imaging Physics.

The Membership examination consists of four Parts- Parts I and II are given first in a 2.5 hour sitting followed by a lunch break. Parts III and IV are given immediately after the lunch break in a second 2.5 hour sitting. Part I consists of short questions covering general medical physics that must be answered by all applicants. Parts II, III and IV are specific to each sub-specialty and consists of questions that must be answered by applicants in the appropriate sub-specialty.

Part II examines the practical aspects for each sub-specialty. Parts III and IV are based on the present question bank for each sub-specialty. Part III of the question bank contains 20 questions that test the in-depth knowledge of the candidate for each sub-specialty. Part IV of the question bank contains 10 questions that cover areas, not necessarily directly related to the sub-specialty, but for which the candidate is expected to possess expertise.

For each sub-specialty, Part III of the Membership examination consists of one question selected randomly from the corresponding Part III of this question bank, and Part IV of the Membership examination consists of one question selected randomly from the corresponding Part IV of this question bank.

I would like to extend my appreciation to the Fellows/Members who assisted in the preparation of this edition. In particular, I would like to thank Drs. Katharina Sixel, Brenda Clark and John Schreiner who extensively reviewed and edited the questions in the Radiation Oncology Specialty. Special thanks also to Drs. George Mawko and Michael Kolios for making the document available on the Worldwide Web.

Ting-Yim Lee, PhD, FCCPM.  
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Lawson Health Research Institute and  
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## **FOREWORD TO THE FIFTH EDITION**

This fifth edition is the result of a review to update certain questions related to general nuclear medicine and to radiation biology and radiation protection as related to medical physics. Some new questions were also added in these areas to keep abreast of new developments.

The Canadian College of Physicists in Medicine certifies competency in Medical Physics through its Membership examination. Certification for competency in Medical Physics is given in four sub-specialties: Therapeutic Radiological (Radiation Oncology) Physics, Diagnostic Radiological Physics, Nuclear Medicine Physics, and Magnetic Resonance Imaging Physics.

The Membership examination consists of four Parts- Parts I and II are given first in a 2.5 hour sitting followed by a lunch break. Parts III and IV are given immediately after the lunch break in a second 2.5 hour sitting. Part I consists of short questions covering general medical physics that must be answered by all applicants. Parts II, III and IV are specific to each sub-specialty and consists of questions that must be answered by applicants in the appropriate sub-specialty.

Part II examines the practical aspects for each sub-specialty. Parts III and IV are based on the present question bank for each sub-specialty. Part III of the question bank contains 20 questions that test the in-depth knowledge of the candidate for each sub-specialty. Part IV of the question bank contains 10 questions that cover areas, not necessarily directly related to the sub-specialty, but for which the candidate is expected to possess expertise.

For each sub-specialty, Part III of the Membership examination consists of one question selected randomly from the corresponding Part III of this question bank, and Part IV of the Membership examination consists of one question selected randomly from the corresponding Part IV of this question bank.

I would like to extend my appreciation to the Fellows/Members who assisted in the preparation of this edition. In particular, I would like to thank Dr. Anna Celler and Dr. Piotr Slomka who offered suggestions and made upgrades to questions in general nuclear medicine, and Dr. Shirley Lehnert (a radiobiologist at McGill University) and Dr. Peter Raaphorst for reviewing and upgrading questions in radiation biology related to medical physics.

B. Gino Fallone, PhD, FCCPM, ABMP  
Chief Examiner, CCPM  
McGill University, Montreal, July 1998.

## **FOREWORD TO FOURTH EDITION**

This new edition of the question booklet has been produced to reflect the new format of the membership exam, which now examines candidates of Medical Physics in four distinct specialties, Radiation Oncology, Diagnostic Radiology, Nuclear Medicine and Magnetic Resonance.

The new format consists of four parts; Part I is a series of short answer questions common to all specialties, examining the candidate's general knowledge of Medical Physics; Part II is specialty specific, examining practical aspects of the discipline; Part III examines the candidate's in-depth knowledge of the specialty, while Part IV examines areas, not necessarily directly related to the specialty but in which the candidate is expected to possess some expertise.

This booklet contains the question bank for parts III and IV of each specialty, with 20 questions in part III and 10 in part IV. For the exam, one question will be selected from each question bank

I would like to thank my many colleagues within the CCPM who assisted in the preparation of this new edition, and in particular Drs. E. Podgorsak, W. Huda, R. Sloboda and B. Rutt. I am also indebted to Dr. D. Nishimura of Stanford University for allowing us to use questions from his course notes "Introduction to Magnetic Resonance Imaging".

T. M. Peters, PhD, FCCPM  
Chief Examiner, CCPM  
Montreal, December 1994

## **FOREWORD TO THIRD EDITION**

The purpose of this third edition is to update some of the questions which were deemed outmoded or inappropriate, and to add two new sections on Magnetic Resonance (imaging and spectroscopy), and Imaging Techniques. The previous Physics of Imaging section becomes Miscellaneous Imaging Modalities while all of the theoretical questions have been moved to the new Imaging Techniques section.

This booklet now contains 110 questions related to various branches of Physics in Medicine. The questions are placed in eleven groups (from A to K) of ten questions each, and one question will be randomly chosen out of each group of ten to form the examination for Membership in the Canadian College of Physicists in Medicine (CCPM). The examination will thus consist of eleven questions out of the 110, and the candidate will be expected to answer three of the eleven questions. The candidate should therefore study three groups of ten questions and be prepared at the examination to spend about one hour answering one of the questions selected from, each of the three groups.

The question bank will continue to be periodically reviewed with the intent of improving the coverage of Medical Physics and to keep abreast of new developments.

I would like to thank Ervin Podgorsak for the work he put into the compilation of the first two editions of this book, and all of the CCPM Fellows who helped both of us with suggestions and advice during the preparation of this and the earlier revisions.

Terry M. Peters, PhD, FCCPM  
Montreal, Quebec  
January 1990

## **FOREWORD TO SECOND EDITION**

During the 1985 general assembly of Fellows and Members of CCPM it was agreed that the format for the 1986 and 1987 written examinations will be essentially the same as that for the 1984 and 1985 examinations. A committee was assembled, however, to review the question booklet and suggest improvements and modifications. This booklet is the result of the review.

I would like to thank the following Fellows or Members who agreed to review individual sections of the booklet: Dr. Andrew Rainbow (Section A), Cupido Daniels (Section B), Dr. Ron Sloboda (Section C), Dr. Geoffrey Dean (Section D), Dr. Conrado Pla (Section E), Karen Breitman (Section F), Chris Thompson (Section G), Dr. Montague Cohen (Section H) and Dr. Ellen El-Khatib (Section I). I would also like to thank Ms. Lisette Fortin for the typing and preparation of the revised booklet.

McGill University  
Montréal, Québec  
November 1985

Ervin B. Podgorsak, PhD, FCCPM  
Chairman  
CCPM Examination Committee

## **FOREWORD TO THE FIRST EDITION**

This booklet contains 90 questions related to various branches of Physics in Medicine. The questions are placed in nine groups (from A to I) of ten questions, and one question will be randomly chosen out of each group of ten to form the examination for Membership in the Canadian College of Physicists in Medicine (CCPM). The examination will thus consist of nine questions out of the 90, and the candidate will be expected to answer three of the nine questions. The candidate should therefore study three groups of ten questions and be prepared at the examination to spend about one hour answering each of the three questions. Information about the exact examination rules and examination dates is available from the Registrar of CCPM.

In the future the question bank will be periodically reviewed with the intent to improve the coverage of Medical Physics and to keep abreast with new developments. No changes, however, will be made for the 1984 and 1985 examinations.

I would like to thank the Fellows of CCPM and the considerable number of interested non-fellows who helped me with suggestions and advice during the preparation of the questions. In particular, I would like to thank Drs. Trevor Craddock, and Frank Prato for preparing the second half of section C as well as section D, Dr. Michael Bronskill for preparing section G, and Drs. René Béique and Douglas Cormack for help with section H. I would also like to thank Ms. Francine Lecours for the typing and preparation of the booklet.

McGill University  
Montréal, Québec  
January 1984

Ervin B. Podgorsak, PhD, FCCPM  
Chairman  
CCPM Examination Committee