Study Tips

CCD™ Self-Study Guide

Certified Clinical Densitometrist (CCD™)

^ 2013 (ISCD) International Society For Clinical Densitometry Middletown, CT
Table of Contents

1. Introduction and Background
2. Test Specifications
3. Study Plan
4. How to Study
5. Multiple-Choice Question Format
6. Tips for Answering Questions
7. Glossary of Terms
8. Scoring the Test
1. INTRODUCTION AND BACKGROUND

Congratulations on your commitment to demonstrate your level of professionalism by becoming a CCD™. Certification protects the public by establishing standards of practice in the field. The examination is documented to the CCD™ Content Outline based on the core body of knowledge that defines knowledge required for competency in performing central densitometry scans. There is an established, industry-accepted methodology applied to item writing, test development and review. Recognized standard statistical analysis is applied to test results ensuring they meet certification industry standards and best practices in the United States.

These Study Tips have been prepared to help you get ready for the CCD™ Examination. It was designed to provide an organized approach to the exam. Studies have shown that adults learn differently from each other, and multiple study techniques work best. Review the study guide to help you identify the areas you will find helpful as you develop your study plan.

This document is the basis for the CCD™ Examination and should be reviewed in depth.

Core References:
1) Bonnick, Sydney Lou Bone Densitometry in Clinical Practice: Application and Interpretation Second Edition by Sydney Lou Bonnick
2) ISCD Clinician Study Guide: Version 9.1
   **U.S. Osteoporosis Essentials Course Attendees will be provided a ISCD Study Guide**
3) 2007 International Society for Clinical Densitometry Position Statements, International Society for Clinical Densitometry

2. TEST SPECIFICATIONS

- The CCD™ examination has a total of 75 multiple choice questions.
- Candidates will have two hours to complete the CCD™ Examination. The exam is computer-based and administered four times per year.
- Instructions will be sent to the candidate prior to the exam.
- Candidates are responsible for timing themselves to ensure there is sufficient time to complete the examination in three hours.
- Each question qualifies for one point; incorrect answers are not deducted from the number of correct answers.
- The matrix on the following page identifies the number of questions by content area.

There are three levels of questions based on the cognitive or thinking levels.

1. Knowledge or Recall items/questions. They recognize specific information and facts that do not vary by situation. Such questions are predominately an effort of memory and include the recall of specific facts, generalizations, concepts, theories, formulae and procedures.

^ 2013 (ISCD) International Society For Clinical Densitometry Middletown, CT
2. **Application questions.** They require comprehension, interpretation, or manipulation of concepts or data. They primarily test simple interpretations or applications of limited data. Questions may require recognition of more than one element or concept and the ability to apply knowledge to a specific situation.

3. **Analysis questions.** They require the integration or synthesis of a variety of concepts and/or elements to solve a specific problem situation. Questions test the ability to gather information, evaluate data and decision-making.

3. **STUDY PLAN**

- Your objective should be to arrive at the examination secure in the knowledge that, through a well-planned course of study and your practical experience, you are in as strong a position as possible to be successful.
- Draft a study schedule/timeframe based on your objectives and a realistic view of your time available for study and preparation.
- Discuss your objectives and study plan with a colleague or mentor who is willing to discuss the examination materials with you and assist you during your study phase.

**Study Techniques**

Using your experience, think about study techniques that have helped you in the past and any others you may have come across. How do you learn something new on the job?

Some ideas you may want to consider include:

- Summarize the main ideas in the test.
- Write study questions for self-testing based on materials in the text.
- Use the key terms to identify not only definitions but use them for review.
- Identify/flag key words, terms and concepts you do not know.
- Prepare flash cards to capture key terms, definitions, and other material that you have identified for additional study.
- Work with a partner or study group to teach and test each other.
- Test yourself frequently. What do I know? Do not spend time studying what you know. Use what you know for review at the end of the study process.
- What is troublesome? Identify someone to help you understand sections you do not know and find difficult.
Develop a Study Plan

Once you have considered the different study options available to you, it is still important to draft a study schedule/timeframe based on your objectives and a realistic view of your time for study and preparation.

The first step you should take is to determine your personal study objectives based on the Content Outline and text books the exam is based on.

- You may want to write out your objectives and post them in a visible location.
- Advanced planning will provide multiple benefits as you prepare for the CCD™ examination. The most important part of a study plan is to identify how, when, and where you want to study.
- By reviewing the CCD™ Content Outline and Examination Specifications (CCD Handbook) you will be able to identify the areas that are familiar, those you wish to review in detail and those that are new to you and need in-depth study.
- You are now in a position to develop an overall study plan with specific timelines.
- Prepare a study schedule – be realistic. Space your studying and allow ample time for review.
- Keep a copy of the CCD™ Content Outline in a prominent place as you will refer to it often.
- Make the best of your environment. Some individuals prefer to study in a quiet place, while others prefer working with the radio or television on in the background.
- Be prepared to study in free moments, whenever you can. This means identifying times that are available to you for study such as travel time, standing in line and queues, waiting for a meeting to start, etc.

Summary

Relax while studying. Preparing for the CCD™ Examination is an opportunity to learn and taking the test is a means to demonstrate your knowledge and ability. Maintain a positive attitude and allocate sufficient study time. Then you will be confident taking the examination.

Take breaks, exercise. Keep your body and mind relaxed.

A sample Study Plan is shown below – you may wish to reproduce it to assist you in your preparation for the examination.
<table>
<thead>
<tr>
<th>Content Outline</th>
<th>Topic</th>
<th>Page Reference</th>
<th>Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. **HOW TO STUDY**

As adults, we know that we learn in a variety of ways that differ significantly from the way we learned as children. As you read the study materials, you will be able to compare the information with your own experience and knowledge. You can use the information you are studying in several ways:

- If this is information you already know, the materials will reinforce your knowledge.
- If the information is new to you, you can relate it to your own experience and consider how the information can be used in your job.
- Frequent Recall and Use: build regular reviews into your study sessions. Be selective about what you need to recall - use key terms and facts.
- Indicate Significance: make the information you need to recall stand out by emphasizing it; link the information to your experience; use mnemonics.
- Link to Other Items: link information to your own experience; look for patterns and relationships among the items; compare and contrast information.
- Regular Review: plan regular review of key points; end a session by summarizing what you have studied.
- Getting started can be difficult: starting a session with a brief review of the previous session may be helpful.
- If you are not feeling motivated, consider why you started this study in the first place and think about what the CCD™ credential will enable you to do.
- Build in rewards - at the end of study sessions, at the completion of a predetermined number of study sessions, and when you have completed your study.
- It is important to think positively during your preparation period. If you do not feel comfortable about your memory, monitor your progress. You will be pleased at how much you can recall.
- There are no trick questions. As you take and study the sample test, you will see how straightforward the questions are.
- The answers to all multiple-choice questions have been documented to the Study Texts.

5. **MULTIPLE-CHOICE QUESTION FORMATS**

**Levels of Multiple-Choice Questions**

The CCD™ Examination is made up entirely of multiple-choice questions. There are three levels of questions based on the cognitive or thinking levels required to correctly answer a question.
Knowledge questions are recall questions.

Application questions apply knowledge.

Analysis, also called higher level thinking, questions require both knowledge and application skills.

There are several standard formats for multiple-choice questions. Becoming familiar with the various types will assist candidates as they prepare for the examination.

**Sample Generic Questions**

Correct answers are noted by an *

**Recall/Knowledge:** Recall or knowledge questions recognize specific information and facts that do not vary by situation. Such questions are predominantly an effort of memory and include the recall of specific facts, generalizations, concepts, theories, formulae and procedures.

What is the time difference between Greenwich Mean Time and U.S. Eastern Standard Time?

A. Plus 5 hours  
B. Plus 6 hours  
*C. Minus 5 hours*  
D. Minus 6 hours

**Application:** Application questions require comprehension, interpretation, or manipulation of concepts or data. They primarily test simple interpretations or applications of limited data. Questions may require recognition of more than one element or concept and the ability to apply knowledge to a specific situation.

If the time in London, using Greenwich Mean Time, is 7:30 P.M., what time will it be in New York, using Eastern Standard Time (EST)?

A. 12:30 A.M.  
B. 1:30 A.M.  
C. 1:30 P.M.  
*D. 2:30 P.M.*

**Analysis:** Analysis questions require the integration or synthesis of a variety of concepts and/or elements to solve a specific problem situation. Questions test the ability to gather information, evaluate data and decision making. Analysis questions often require value judgments concerning the effectiveness, appropriateness or best course of action in a given situation.

If a flight taking off from London at 12:35 P.M. takes 6.5 hours to reach New York, what time will it land, using Eastern Standard Time (EST)?

A. 1:05 P.M.  
*B. 2:05 P.M.*

^ 2013 (ISCD) International Society For Clinical Densitometry Middletown, CT
Direct or Closed Question: A complete question followed by four options; there is only one correct answer to direct or closed questions.

Who was the King of England in 1484?
- A. George I
- *B. Richard III
- C. Edward IV
- D. Henry V

Open Question or Incomplete Sentence: An incomplete sentence with four options; there is only one correct answer to incomplete sentence questions.

Confederate Commander General Robert E. Lee’s horse was named:
- A. Trigger.
- B. Silver.
- *C. Traveler.
- D. Champion.

Complete Question that includes the phrase “which of the following”: is used when there is more than one correct answer to a question, but ONLY one of the correct answers is offered in the options.

Which of the following is a prime number?
- *A. 7
- B. 10
- C. 12
- D. 15

Complex Multiple-Choice: There may be more than one correct answer. The response will include options.

Which of the following cities are capitals of their respective countries?
1. Paris
2. Washington D.C.
3. Chicago
4. Sydney

- A. 4 only
- *B. 1 and 2 only
- C. 1, 3 and 4 only
- D. 2, 3 and 4 only

Negatively Worded or EXCEPT questions: Three of the four options are correct and only one option is incorrect. There is only one answer for EXCEPT questions.
All of the following are primary colors EXCEPT

*A. Orange
B. Red
C. Blue
D. Green

Key Words-LEAST, BEST, and MOST: The question requires evaluation and the selection of the appropriate option.

MOST color blind males inherit the gene from their

A. Father.
*B. Mother.
C. Maternal grandmother.
D. Paternal grandfather.

Scenario or Case Study: There is one answer to each question in scenario or case study. There may be more than one question for each information set.

Michael has $100 to purchase clothes. Costs are: shirts, $20 each; sweaters $30 each; slacks $40 per pair; and socks $5 per pair.

• If Michael purchased 1 pair of slacks and 1 sweater, how many shirts can he buy with his remaining money?
  *A. 1
  B. 2
  C. 3
  D. 4

• If Michael spent 40% of his money on socks, how many pairs did he purchase?
  A. 4
  B. 5
  *C. 8
  D. 10

6. TIPS FOR ANSWERING MULTIPLE-CHOICE QUESTIONS

• In multiple-choice questions the answer follows the question. There are four options and only one is correct. Your task is to identify the correct answer from the plausible, but incorrect, distracter answers. The correct answer is called the key and the other options are called distracters.

• Remember that all Multiple-Choice questions have the same format — 4 options but only one correct answer.
• The correct answer is the best answer for each question.

• Only correct answers are scored, so it is to your advantage to answer every question.

• Analyze what the question is asking.

• Try to answer the question before looking at the options. Then decide which option is closest to your answer and is the best option.

• The more questions you answer, the better your chances of achieving a passing score. For best results pace yourself, periodically checking your progress.

• If you are near the end of the examination period, make your best guess at the unanswered questions by eliminating the incorrect/wrong options. You could get the answer correct.

• Read all instructions carefully.

• Do not bring food, beverages, extra paper, books, supplies, etc. into the examination room.

• Do not bring electronic devices into the examination room.

7. Glossary of Terms

ALARA – as low as reasonably achievable – in reference to acquiring x-ray images with the least amount of x-ray exposure to the patient

AP spine – anterior posterior, referring to the position of the patient in regard to the lumbar spine scan (AP or PA spine)

BMC – bone mineral content

BMD – bone mineral density

BUA – broadband ultrasound

DC – direct current

DXA – dual energy x-ray absorptiometry

ERT – estrogen replacement therapy

g/cm² - grams per centimeter squared

K-edge – rare earth filters that produce an X-ray beam with a high number of photons in a specific energy range

∧ 2013 (ISCD) International Society For Clinical Densitometry Middletown, CT
L1-L4 - lumbar 1 through lumbar 4 vertebrae

**LSC** – least significant change. It is the least amount of BMD change that can be considered statistically significant. The ISCD recommends calculating this for a 95% confidence level, which is done by multiplying the precision error by 2.77.

**mg** – milligrams

**NOF** – National Osteoporosis Foundation

**pDXA** – peripheral DXA

**PA** – posterior anterior, referring to the direction that the x-ray beam travels through the patient (PA spine or AP spine)

**QCT** - quantitative computerized tomography

**QUS** – quantitative ultrasound

**ROI** – region of interest

**SD** – standard deviation – estimates the variability of the sample values from the sample mean.

**SOP** – standard operating procedures

**SOS** – speed of sound

**Stadiometer** – devise to measure person’s height

**SXa** – single energy x-ray absorptiometry

**S1**- first sacral vertebrae

**T-Score** - A value in bone densitometry used primarily for the diagnosis of osteoporosis. It is a patient’s current BMD compared to the mean of age at which peak bone density is achieved.

**T12** – twelfth thoracic vertebrae

**Ward’s region** – A region of interest in a femur scan located at the lower end of the femoral neck. It is predominantly trabecular bone and contains the least amount of bone mineral within the neck region. It is not a true anatomical site. ISCD does not recommend its use clinically.

**WHO** – World Health Organization

**Z-score** - A measure of deviation from the reference population expressed in units of the population’s standard deviation. The Age Matched Z-score indicates how much the patient deviates from the mean Age Matched values.

**33% radius** is the measurement made of the forearm, also referred to as the 1/3 s
8. **SCORING THE EXAMINATION**

Candidates will be notified in writing with a pass/fail score within four to six weeks following the close of the examination window. No results will be provided by telephone, fax or email. Scores are released ONLY to the individual candidate. For information on the methodology for scoring the examination, refer to the Candidate Handbook available on the ISCD Web site [www.iscd.org](http://www.iscd.org).