

## USING AI TO GENERATE PRACTICE CASES

Practicing cases and group simulations can be effective prep methods. You can create realistic cases like the exam format using tools like Copilot, ChatGPT, or Gemini, which use large language models (LLM).

Although AI-generated cases are helpful for exam preparation, LLMs rely on pattern matching rather than logical reasoning, so the outputs may need to be corrected. As optometrists, always verify AI-generated information and cross-check it with reliable sources before making any decisions or recommendations.

An exciting journal article, "[Applications of ChatGPT in the diagnosis, management, education, and research of retinal diseases: a scoping review](#)" concludes, "The issue of generating understandable outputs is particularly nuanced, **often depending on how prompts are crafted and specified**. Studies that have reported less understandable outputs may not have explicitly requested accessible responses, underscoring the importance of prompt engineering. Additionally, the consistent need for human supervision cannot be overstated. While AI can provide valuable support, it is crucial to ensure that the final decision-making remains in the hands of healthcare professionals."

The sections below give a sample prompt and the resulting practice case. To help you prepare, we have asked the prompt to provide more information you will receive on your exam cases.

If you develop more effective prompts than the draft prompt, please send them to [exams@oebc.ca](mailto:exams@oebc.ca). We will include improvements in future updates of this guide.

## GUIDELINES – HOW TO CREATE CASES

### 1. Select a Topic

- a) Choose a relevant topic for the case. Here are a few methods:
  - a. Select a topic from Appendix A – Topic Matrix in the OEBC Blueprint: <https://oebc.ca/resources/exam-blueprint/>. Focus on subtopics where your response isn't automatic, as these need more attention.
  - b. Select a topic from an enabling competency in the OEBC Blueprint: <https://oebc.ca/resources/exam-blueprint/>. See Table 1 - Case Selection by Prime Practice Area on page 1 for question distribution. Focus on areas requiring additional practice.
  - c. Identify a common condition or scenario that optometrists often encounter, such as Posterior Capsular Opacification or Laser Peripheral Iridotomy. This method is helpful for targeted follow-up on specific areas.

### 2. Varying the inputs

Adjust the prompt to introduce a different topic and alter the patient's demographics. Instead of using a topic state, say, "Draft a sample case for an optometry exam for a professional with an OD degree that necessitates using [identify competencies]. Include these elements . . ."

### 3. Use a Sample OSCE or Written Case Prompt

Copy and paste the sample prompt into an LLM. Generate the output.

You can then ask the LLM to:

- recreate the case with specific inputs that would change your diagnosis
- create a similar case for a person half the age, opposite gender, and with various medical conditions (i.e. high blood pressure, diabetes, etc.)

The draft prompt asks six questions for each case for the written exam prompts, while only four are on the exam to give you extra practice.

Many of the Written cases include digital media. LLMs could be better at selecting or creating realistic digital images of eyes. So, ask for a description and look up an image online.

For a study group, assign 4 or 5 topics to each member to create OSCE and written cases. Individually validate the information and then share the refined cases with your group. Score them together—a great way to get feedback.

## PROMPT FOR GENERATING A PRACTICE WRITTEN EXAM CASE

Design a comprehensive optometry case study for an individual specializing in Low Vision (OD degree). The case should be structured to simulate a clinical exam scenario and must include the following elements:

### 1. Demographics:

Provide details for the patient, including name, age, gender, and occupation.

### 2. Chief Complaint:

Describe the patient's primary complaint or reason for visiting.

### 3. Ocular History:

Include relevant ocular history, such as previous diagnoses, treatments, surgeries, and other significant eye-related events.

### 4. Medical History:

Provide relevant systemic medical history, including medications, past surgeries, family history, or chronic conditions affecting vision (e.g., diabetes, hypertension).

### 5. Clinical Data:

Include detailed clinical findings such as:

- Unaided Visual Acuity (VA).
- Subjective Refraction results.
- Tonometry readings (intraocular pressure).
- Pupils (reactions, defects).
- Slit Lamp Examination findings.
- Fundus Examination results (e.g., optic nerve, macula).
- Optical Coherence Tomography (OCT) results.

### 6. Imaging:

Describe in detail what each relevant clinical image (e.g., fundus photography, OCT scans) should show. Include how each image is obtained and what abnormalities or features are present.

### 7. Case Questions:

Formulate **six** multiple-choice questions (with three answer options each) related to the case scenario. The questions should assess understanding of the diagnosis, treatments, and clinical reasoning.

### 8. Diagnosis and Management Plan:

Provide the correct diagnosis, along with a detailed management plan. The plan should include:

- Necessary treatments (e.g., medications, low vision aids)
- Follow-up schedule
- Risks and complications

- Patient education
- Possible ethical issues (e.g., managing patient expectations, discussing prognosis).

## 9. Correct Answers with Competency Explanations

For each of the six case-related questions:

1. **Identify the correct answer.**
2. **Provide a detailed explanation** of why this answer is correct based on clinical reasoning.
3. **Reference the relevant enabling competency** from [Written Sample Cases](#) on the OEBC website, corresponding to the knowledge or skills required to select the correct answer.
  - Ensure that for **every competency**, you provide:
    - **Competency Code (e.g., 1.4.2): Copy the exact, verbatim text** from the OEBC Blueprint to describe the competency required for the correct answer.
    - **Competency Lookup:** If the competency is not known, **search the OEBC Exam Blueprint** for relevant terms (e.g., “functional impact on daily activities” or “low vision aids”) to find the most appropriate enabling competency. The indicators below an enabling competency have a letter code. The relevant term may be used as an indicator. Each enabling competency or related indicator should directly match the skill required for the case.
  - Ensure the same process is followed for all six answers—i.e., both the code and verbatim text must be consistently applied across all answers.

## 10. Patient-Informed Questions

Provide six likely questions an informed patient might ask their optometrist based on the given diagnosis. For each question, provide a clear, patient-friendly answer.

## 11. Diagnostic Questions

List **six questions** you would ask the patient to help confirm the diagnosis and explain why these questions are relevant to the case scenario.

**Note: The practice case that follows is the exact output from CoPilot based on the preceding prompt. It serves as an example of the case generated by the AI. Since large language models are constantly evolving, the content and formatting of the case may differ depending on the specific model used at the time of the entry.**

**It is your responsibility to edit and verify the case for accuracy.**

## AI-GENERATED PRACTICE WRITTEN EXAM CASE — LOW VISION:

### Demographics

- **Patient Name:** John Doe
- **Age:** 65
- **Gender:** Male
- **Occupation:** Retired Engineer

### Chief Complaint

John Doe presents with a primary complaint of progressively worsening vision over the past year, making it difficult for him to read, recognize faces, and perform daily activities.

### Ocular History

- **Previous Diagnoses:** Age-related macular degeneration (AMD) was diagnosed 5 years ago.
- **Treatments:** Intravitreal injections of anti-VEGF (vascular endothelial growth factor) for AMD.
- **Surgeries:** Cataract surgery in both eyes 10 years ago.
- **Other Significant Events:** None.

### Medical History

- **Systemic Medical History:**
  - Diabetes Mellitus Type 2 for 15 years, managed with oral hypoglycemic agents.
  - Hypertension for 10 years, managed with antihypertensive medications.
- **Medications:** Metformin, Amlodipine, Lisinopril.
- **Past Surgeries:** Appendectomy 20 years ago.
- **Family History:** Father had glaucoma, mother had AMD.
- **Chronic Conditions Affecting Vision:** Diabetes and hypertension.

### Clinical Data

- **Unaided Visual Acuity (VA):**
  - Right Eye (OD): 20/200
  - Left Eye (OS): 20/400
- **Subjective Refraction Results:**
  - OD: +1.00 -1.25 x 90
  - OS: +1.50 -1.50 x 85
- **Tonometry Readings (Intraocular Pressure):**
  - OD: 15 mmHg
  - OS: 16 mmHg
- **Pupils:**
  - Reactions: Normal
  - Defects: None
- **Slit Lamp Examination Findings:**
  - Anterior segment: Clear cornea, well-centred intraocular lenses (IOLs), quiet anterior chamber.
- **Fundus Examination Results:**
  - Optic Nerve: Normal cup-to-disc ratio (0.3)

- Macula: Drusen and geographic atrophy in both eyes.
- **Optical Coherence Tomography (OCT) Results:**
  - OD: Thinning of the retinal layers with areas of atrophy.
  - OS: Similar findings with more extensive atrophy.

## Imaging

- **Fundus Photography:** Shows drusen and areas of geographic atrophy in the macula of both eyes.
- **OCT Scans:** Detailed images showing thinning of the retinal layers and areas of atrophy. These images are obtained using a non-invasive imaging technique that provides cross-sectional views of the retina.

## Case Questions Examples (OEBC uses a 3-answer format on the exam)

1. What is the most likely diagnosis for John Doe's visual impairment?
  - A. Glaucoma
  - B. Diabetic Retinopathy
  - C. Age-related Macular Degeneration (AMD)
  - D. Cataract
2. Which treatment is most appropriate for managing John Doe's condition?
  - A. Laser photocoagulation
  - B. Intravitreal anti-VEGF injections
  - C. Vitrectomy
  - D. Oral steroids
3. What is the primary goal of low vision rehabilitation for John Doe?
  - A. To cure his AMD
  - B. To improve his visual acuity to 20/20
  - C. To enhance his remaining vision and improve his quality of life
  - D. To prepare him for potential blindness
4. Which low vision aid would be most beneficial for John Doe?
  - A. Magnifying glasses
  - B. Contact lenses
  - C. Reading glasses
  - D. Sunglasses
5. What is a potential complication of intravitreal anti-VEGF injections?
  - A. Retinal detachment
  - B. Cataract formation
  - C. Increased intraocular pressure
  - D. Corneal abrasion
6. How often should John Doe follow up with his optometrist to monitor his condition?
  - A. Every month
  - B. Every 3 months
  - C. Every 6 months
  - D. Annually

## Diagnosis and Management Plan

- **Diagnosis:** Age-related Macular Degeneration (AMD)
- **Management Plan:**

- **Treatments:** Continue intravitreal anti-VEGF injections as needed.
- **Low Vision Aids:** Provide magnifying glasses and electronic reading aids.
- **Follow-up Schedule:** Every 3 months to monitor progression and treatment efficacy.
- **Risks and Complications:** Discuss potential risks of injections, including retinal detachment and increased intraocular pressure.
- **Patient Education:** Educate John on controlling diabetes and hypertension to prevent further vision loss.
- **Ethical Issues:** Manage patient expectations regarding the prognosis and discuss the potential for further vision loss.

## Correct Answers with Competency Explanations (reference the OEBC Blueprint)

1. **Correct Answer:** C. Age-related Macular Degeneration (AMD)
  - **Explanation:** The clinical findings of drusen and geographic atrophy in the macula are characteristic of AMD.
  - **Competency Code:** 1.5.1 - "Forms a final diagnosis".
2. **Correct Answer:** B. Intravitreal anti-VEGF injections
  - **Explanation:** Anti-VEGF injections are the standard treatment for wet AMD to reduce neovascularization and prevent further vision loss.
  - **Competency Code:** 1.6.1 - "Form a treatment plan".
3. **Correct Answer:** C. To enhance his remaining vision and improve his quality of life
  - **Explanation:** The goal of low vision rehabilitation is to maximize the use of remaining vision and improve the patient's ability to perform daily activities.
  - **Competency Code:** 1.8.3 - "Educate the patient on the use of spectacles and the importance of follow-up".
4. **Correct Answer:** A. Magnifying glasses
  - **Explanation:** Magnifying glasses can help John read and perform close-up tasks, which are challenging due to his low vision.
  - **Competency Code:** 1.8.1 - "Apply the patient's refraction, visual requirements and other findings to determine the spectacle and/or contact lens prescription and lens form/type".
5. **Correct Answer:** A. Retinal detachment
  - **Explanation:** Retinal detachment is a known complication of intravitreal injections.
  - **Competency Code:** 1.11.1 - "Prescribe a pharmaceutical prescription for the treatment of ocular conditions or diagnosed diseases".
6. **Correct Answer:** B. Every 3 months
  - **Explanation:** Regular follow-up every 3 months is necessary to monitor the progression of AMD and the effectiveness of treatment.
  - **Competency Code:** 1.11.7 - "Educate the patient on the need for, and importance of, frequency of follow-up on certain conditions".

## Patient-Informed Questions

1. **Question:** Will my vision improve with the treatment?
  - **Answer:** The treatment aims to prevent further vision loss and stabilize your condition but may not significantly improve your vision.
2. **Question:** Are there any side effects of the injections?
  - **Answer:** Possible side effects include eye pain, increased intraocular pressure, and, in rare cases, retinal detachment.

3. **Question:** How can I manage my daily activities with low vision?
  - **Answer:** We can provide you with low vision aids such as magnifying glasses and electronic reading devices to help you with daily tasks.
4. **Question:** Can my condition lead to complete blindness?
  - **Answer:** While AMD can cause significant vision loss, complete blindness is rare. Regular monitoring and treatment can help manage the condition.
5. **Question:** What can I do to prevent further vision loss?
  - **Answer:** Controlling your diabetes and hypertension, eating a healthy diet, and avoiding smoking can help prevent further vision loss.
6. **Question:** How often should I visit the optometrist?
  - **Answer:** You should visit the optometrist every 3 months to monitor your condition and adjust the treatment plan as needed.

## Diagnostic Questions

1. **Question:** When did you first notice the vision changes?
  - **Relevance:** Helps determine the onset and progression of the condition.
2. **Question:** Do you have any difficulty seeing at night?
  - **Relevance:** Night vision difficulties can be associated with AMD.
3. **Question:** Have you noticed any changes in your central vision, such as distortion or blurriness?
  - **Relevance:** Central vision changes are common in AMD.
4. **Question:** Do you have any family history of eye diseases?
  - **Relevance:** Family history can provide clues about genetic predisposition to AMD.
5. **Question:** Are you experiencing any new symptoms, such as flashes of light or floaters?
  - **Relevance:** New symptoms could indicate complications like retinal detachment.
6. **Question:** How well are you managing your diabetes and hypertension?
  - **Relevance:** Poorly controlled systemic conditions can exacerbate AMD.

## References

[OEBC Exam Blueprint 2022](#)