

# Unit 7

## AI Revolution in Health and Medicine



### Warm Up

In academic writing, authors develop their arguments through written text and use figures or tables to visually represent concepts or information. To integrate textual and graphical information effectively, we need to understand the relationship between graphs and the written content and to be proficient in the summarizing and paraphrasing techniques introduced in Unit 6. Solid skills in integrating text and visuals enable us to express ideas and insights more fully and effectively in academic contexts.

In Unit 7, we will learn to:

- Understand the relationship between graphs and the written text;
- Apply summarizing and paraphrasing techniques effectively to integrate text and visuals;
- Integrate information from reading with personal experience or observation to develop one's own argument.

## Useful Strategies and Language

### 1 Context

When discussing AI technology, most people think of ChatGPT. In fact, applications of AI have already affected many aspects of human life. The following short essay explores the use of AI technology in the field of medicine.

#### **Beyond ChatGPT: Revolutionizing Medical Diagnostics with AI Models**

ChatGPT, the most well-known AI model, is able to interact with its users in such a sophisticated manner that many people find it hard to accept that it is not actually a person. ChatGPT is able to do this because it has been trained using vast amounts of textual data. Other AI models, however, have been trained using other types of data. Some of the most compelling examples are the models trained on medical images such as X-rays and ultrasound scans. These models are fed millions of medical images of both healthy and unhealthy people so that they can quickly and reliably distinguish between the two. This is particularly useful for diseases such as cancer, which are exceedingly difficult for people to properly identify in their early stages—the stages at which treatment is most effective.

The use of these models can thus significantly improve medical professionals' ability to diagnose certain diseases; moreover, they can do so at a highly affordable rate. Because the models are software and not hardware, they can be easily reproduced for as many medical facilities as necessary; no additional medical infrastructure is necessary. The overwhelming majority of hospitals in developed countries already process their medical imagery electronically, so they do not even have to change these processes to allow for the use of diagnostic AI models. These models can simply be added to the already existing processes.

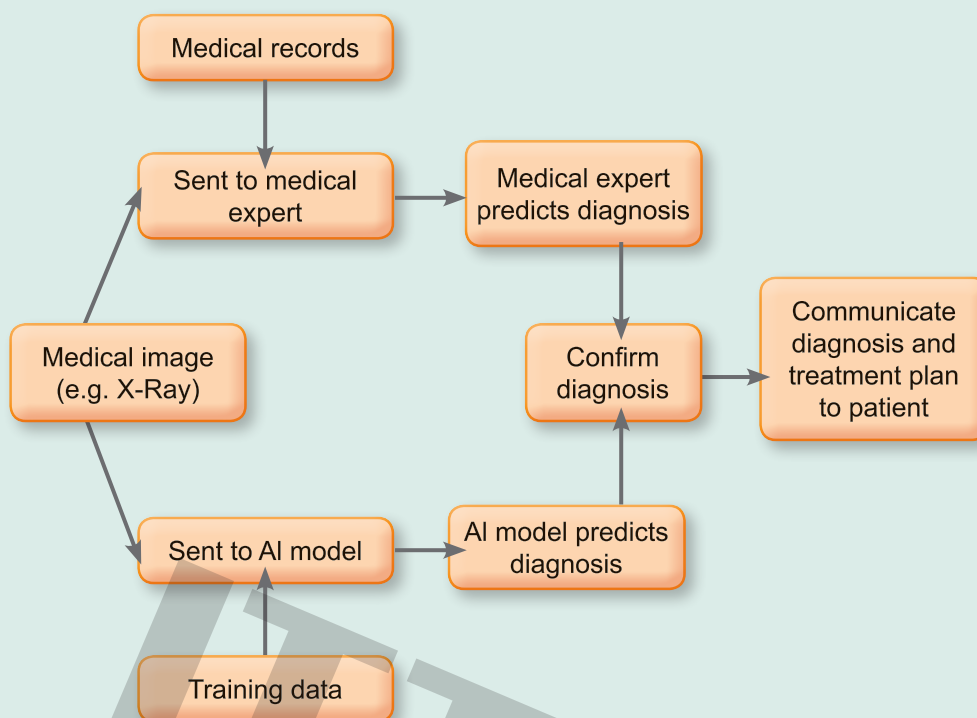


Figure 1 How a diagnosis is made with AI

The figure above illustrates how AI models can be incorporated into the diagnostic process, involving two tracks. First, the patient's data, including medical images, are input into an AI system and sent to medical experts. Then in the AI track, the medical data are compared, using algorithms, with a vast database of medical knowledge and previous cases to identify patterns and potential conditions. Meanwhile, medical experts make an initial diagnosis based on the same data. Finally, the initial diagnosis is compared with the AI-generated diagnosis to make the final decision.

The use of diagnostic AI models alongside medical experts in the above process aims to enhance the accuracy and efficiency of medical diagnoses. Therefore, the application of AI technology should not be seen as limited to what ChatGPT can do. We are only just beginning to explore the wide range of interesting and valuable uses of this technology.

## 2 Steps and Techniques for Summarizing Texts and Visuals

In Unit 6, we practiced summarizing and paraphrasing techniques. In this unit, we will use the texts and graphs from the previous two pages as source material to illustrate techniques for summarizing and synthesizing textual and visual information, which consist of five steps:

- (1) Developing an initial understanding of the text's main idea;
- (2) Extracting key sentences from the text;
- (3) Synthesizing and rewriting the key sentences;
- (4) Summarizing the key points of the graph and analyzing the relationship between the graph and the text;
- (5) Writing the summary.

### Step (1): Developing an initial understanding of the text's main idea

Quickly scan the text and the graph titles, and then write down your initial understanding of the text's main idea.

Title of the text: Beyond ChatGPT: Revolutionizing Medical Diagnostics with AI Models	Initial understanding: Diagnostic AI models are useful and transforming the medical field.
Title of the flowchart: How a diagnosis is made with AI	

### Step (2): Extracting key sentences from the text

Main point	Key sentences
1. Training of medical AI models	<p>"... the models that have been trained on medical images such as X-rays and ultrasound scans."</p> <p>"These models are fed millions of medical images of both healthy and unhealthy people so that they can quickly and reliably distinguish between the two."</p>

2. Improvement in diagnostic abilities	<p>“This is specifically useful for diseases such as cancer, which are exceedingly difficult for people to properly identify in their early stages.”</p> <p>“The use of these models can thus significantly improve medical professionals’ ability to diagnose certain diseases ... at a highly affordable rate.”</p>
3. Integration and accessibility	<p>“Because the models are software and not hardware, ... no additional medical infrastructure is necessary.”</p> <p>“... hospitals in developed countries already process their medical imagery electronically, so they do not even have to change these processes to allow for the use of diagnostic AI models.”</p>

### Step (3): Synthesizing and rewriting the key sentences

Main point	Key sentences synthesized and paraphrased
1. Training of medical AI models	Medical AI models are trained using a large dataset of images, which enables them to quickly analyze the medical imagery of new patients and effectively identify those with and without medical conditions.
2. Improvement in diagnostic abilities	Utilizing these models can greatly enhance doctors’ ability to spot illnesses like cancer early.
3. Integration and accessibility	AI models can easily fit into current medical practices without major changes or high costs, making them widely usable in medical diagnostics.

### Step (4): Summarizing the key points of the graph and analyzing the relationship between the graph and the text

This short essay includes a flowchart. The third paragraph explains the information presented in the figure, clarifying how AI is integrated into the existing diagnostic process and providing supporting details for the argument. The key message of the figure can be summarized in one sentence as follows:

*AI can be used alongside medical experts so that diagnoses are confirmed twice.*

### Step (5): Writing the summary

Link the rewritten sentences from steps (3) and (4) to form a coherent paragraph, as shown in the example below. This summary is approximately 90 words in length and has the following overall structure:

**Sentence #1:** Summarize the main idea of the source text.

**Sentence #2:** Explain how image-based AI can enhance the effectiveness of medical diagnosis.

**Sentence #3:** Refer to the flowchart to describe in detail how AI is integrated into the diagnostic system.

**Sentence #4:** Explain other advantages of AI diagnostic systems, such as their low cost and the lack of need for additional equipment.

**Sentence #5:** Conclude by summarizing the various advantages of AI diagnostic systems discussed in the source text.

## Sample Summary

<sup>1</sup>AI models trained with existing medical images are transforming how we diagnose diseases. <sup>2</sup>Image-based AI can quickly analyze the medical imagery of new patients to spot illnesses like cancer early. <sup>3</sup>These models are highly effective and can be used alongside medical experts so that, as shown in Figure 1, each diagnosis is confirmed twice, once by experts and once by an AI model. <sup>4</sup>Furthermore, these models can diagnose at a much lower cost, needing no extra medical equipment. <sup>5</sup>Most hospitals can readily integrate them into their existing systems, thereby enhancing the cost-effectiveness, accessibility, and efficiency of advanced diagnostics.

## Speaking Task

### 1 Task Content

The passage and chart below are about AI diagnostic models. The information contained in each does not entirely support the other.

#### OPINION

AI diagnostic models are significantly better than humans at making diagnoses from medical images. This is most evident in the early stages of a disease, but it remains true throughout its progression. Though AI diagnostic models are not currently used in all hospitals, it is clear that in the future they will take over much of the job of analyzing medical images, and medical professionals will focus on other areas such as advising patients.

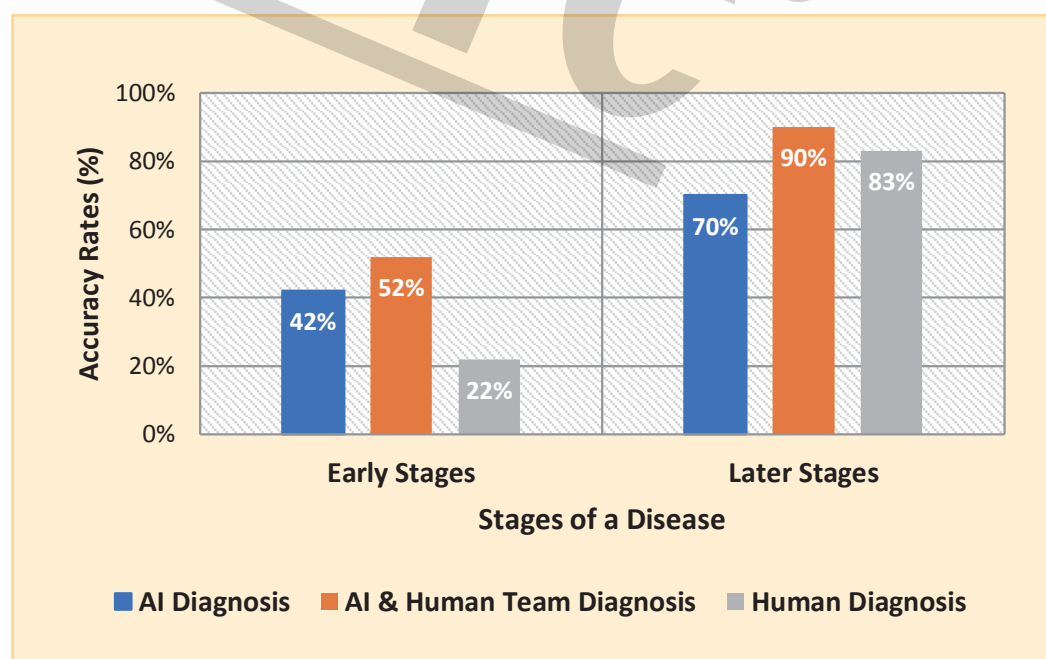


Figure 1 Accuracy rates of AI and human diagnoses from medical images at different stages of a disease

## 2 Task Requirements

You have 2.5 minutes to give your presentation based on the passage and the bar chart. You should:

- (1) Discuss the key differences between the passage and the bar chart;
- (2) Explain whether you agree or disagree with the passage. You may draw examples from your own experience with doctors, hospitals, and AI.

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## Writing Task

Challenge

### 1 Task Content

The following article about medical chatbots appeared in a professional magazine about developments in the field of medicine.

#### Medical Chatbots: Benefits and Challenges

Chatbots are becoming increasingly popular in the medical field due to the numerous benefits they provide. In a 2024 survey conducted at a hospital in Taiwan, as summarized in Figure 1 below, more than half of the surveyed patients expressed a positive attitude toward the use of medical chatbots.

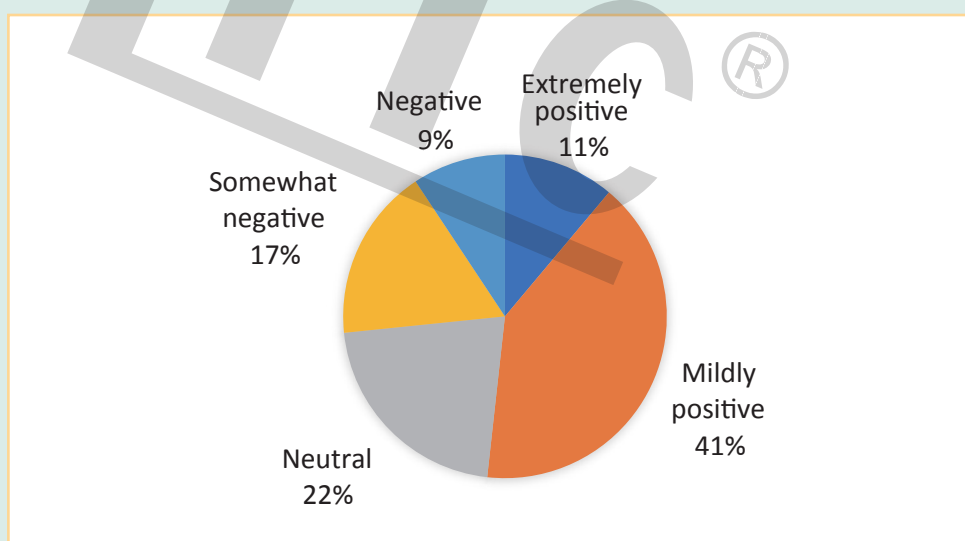


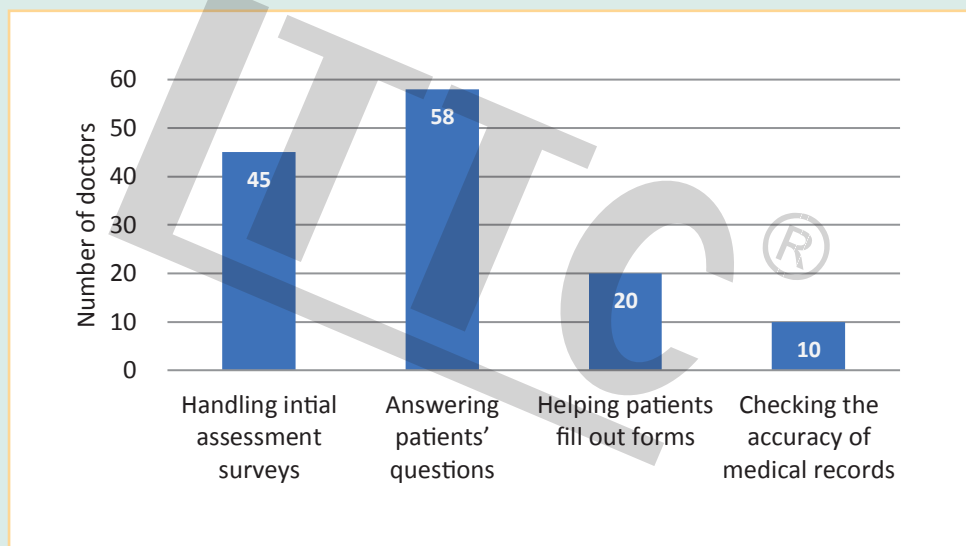
Figure 1 Patients' feelings about medical chatbots (N=352)

The survey also asked medical professionals about the types of assistance that medical chatbots can offer to help patients. Nearly all of the doctors surveyed noted that medical chatbots can provide answers around the clock. This allows patients to get information at times when it would be impossible to do so without chatbots. This is important for patients with chronic conditions or patients with minor health issues

since such patients cannot typically have their questions answered outside of business hours.

Another potential role for medical chatbots is assisting doctors in conducting initial assessment surveys. This function is crucial as the information gathered from these surveys helps prioritize patients who require urgent assistance. If all patients can complete initial assessment surveys that are immediately analyzed by AI, those needing urgent attention can be prioritized over others.

The survey also suggested various other medical uses for chatbots, including administrative tasks, form filling assistance, verifying medical records with patients, and helping patients understand treatment plans.



**Figure 2** Doctors' answers to the question "What are chatbots most useful for?" (N=133)

However, some surveyed doctors expressed concerns about potential risks associated with medical chatbots. One such concern is the phenomenon of *AI hallucination*, where a chatbot may provide false information. If a medical chatbot fabricates information, it could have serious consequences endangering the health and safety of patients. Therefore, despite the clear advantages of medical chatbots, many doctors caution that their integration into the medical system must be approached with the utmost care.

## 2 Task Requirements

Based on the above article, write an essay to discuss the following topic:

### **How to best utilize chatbots to help patients**

In your essay, you should:

- (1) Summarize the main points of the text;
- (2) State your own opinion on the topic.

Your essay should be 150–180 words in length.

An introduction for this essay is provided below. Please continue by completing parts (1) and (2).

*Medical chatbots are becoming increasingly common in hospitals. I would like to express my opinion about this phenomenon based on an article I recently read in a magazine.*