

Supplementary Material

Comparing Large Language Models (Bard, Bing, and ChatGPT) and Prompt Design for Healthcare
Simulation Case Scenarios

Appendix 03

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Scenario 1 – Prompt Chaining

Bard – Example 1: Iteration 02

Prompt 1: Generate a scenario to train medical students for a stroke or transient ischemic attack (TIA) patient.

Output 1:

Sure, here is a scenario that you can use to train medical students for a stroke or transient ischemic attack (TIA) patient:

Scenario:

It is 12:44 PM on a Tuesday afternoon in August. You are a medical student working in the emergency department of a large hospital. A patient is brought in by ambulance after experiencing sudden onset of weakness on the left side of their body, difficulty speaking, and vision problems in their right eye. The patient is a 55-year-old woman with a history of high blood pressure and diabetes.

Your Tasks:

- As the medical student, you are responsible for assessing the patient and determining whether they are having a stroke or TIA.
- You will need to gather a history from the patient and their family, perform a physical exam, and order appropriate diagnostic tests.
- Based on your findings, you will need to make a diagnosis and develop a treatment plan.
- You will also need to provide patient education about TIAs and the importance of seeking immediate medical attention if they experience any similar symptoms in the future.

Key Points:

- The signs and symptoms of a stroke or TIA can be sudden and dramatic, but they can also be subtle and easy to miss.
- It is important to be aware of the signs and symptoms of a stroke or TIA so that you can seek medical attention promptly.
- The sooner a stroke or TIA is treated, the better the chances of a full recovery.
- Patient education is essential for preventing future strokes and TIAs.

Outcome:

In this scenario, you correctly diagnose the patient with a TIA. You order the appropriate diagnostic tests, which confirm the diagnosis. You start the patient on medication to prevent future strokes and educate them about the importance of seeking immediate medical attention if they experience any similar symptoms in the future. The patient makes a full recovery and is able to go home the next day.

This scenario is just one example of how you can train medical students to assess and treat stroke and TIA patients. By using real-life scenarios and providing students with the opportunity to practice their

skills, you can help them to develop the knowledge and confidence they need to provide excellent care to these patients.

Prompt 2: For that scenario, consider a patient that has a history of an ischemic stroke within the past 3 months.

Output 2:

Sure, here is the same scenario, but the patient now has a history of an ischemic stroke within the past 3 months:

Scenario:

It is 12:44 PM on a Tuesday afternoon in August. You are a medical student working in the emergency department of a large hospital. A patient is brought in by ambulance after experiencing sudden onset of weakness on the left side of their body, difficulty speaking, and vision problems in their right eye. The patient is a 55-year-old woman with a history of high blood pressure, diabetes, and a previous ischemic stroke within the past 3 months.

Your Tasks:

- As the medical student, you are responsible for assessing the patient and determining whether they are having a recurrent stroke.
- You will need to gather a history from the patient and their family, perform a physical exam, and order appropriate diagnostic tests.
- Based on your findings, you will need to make a diagnosis and develop a treatment plan.
- You will also need to provide patient education about recurrent strokes and the importance of seeking immediate medical attention if they experience any similar symptoms in the future.

Key Points:

- The signs and symptoms of a recurrent stroke can be similar to the symptoms of the first stroke.
- It is important to be aware of the signs and symptoms of a recurrent stroke so that you can seek medical attention promptly.
- The sooner a recurrent stroke is treated, the better the chances of a full recovery.
- Patient education is essential for preventing future strokes and TIAs.

Outcome:

In this scenario, you correctly diagnose the patient with a recurrent ischemic stroke. You order the appropriate diagnostic tests, which confirm the diagnosis. You start the patient on medication to prevent future strokes and educate them about the importance of seeking immediate medical attention if they experience any similar symptoms in the future. The patient makes a full recovery and is able to go home the next day.

This scenario is just one example of how you can train medical students to assess and treat patients with a history of stroke. By using real-life scenarios and providing students with the opportunity to practice

their skills, you can help them to develop the knowledge and confidence they need to provide excellent care to these patients.

Here are some additional things to consider when treating a patient with a history of stroke:

- The patient's risk of having another stroke is higher than someone who has never had a stroke.
- The patient may have long-term disabilities as a result of the stroke.
- The patient may need to make lifestyle changes, such as quitting smoking, eating a healthy diet, and exercising regularly.
- The patient may need to take medication to prevent future strokes.

It is important to educate the patient about their stroke and its risks. The patient should also be aware of the signs and symptoms of a stroke so that they can seek medical attention promptly. By working together, the medical student and the patient can develop a treatment plan that will help to prevent future strokes and improve the patient's quality of life.

Prompt 3: For that scenario, add more of the medical history for the patient.

Output 3:

Sure, here is the same scenario, but with more of the patient's medical history:

Scenario:

It is 12:44 PM on a Tuesday afternoon in August. You are a medical student working in the emergency department of a large hospital. A patient is brought in by ambulance after experiencing sudden onset of weakness on the left side of their body, difficulty speaking, and vision problems in their right eye. The patient is a 55-year-old woman with a history of high blood pressure, diabetes, and a previous ischemic stroke within the past 3 months.

The patient's name is Mary Smith. She is a retired teacher who lives alone in a small town. She has been married for 30 years and has two grown children. She has a history of high blood pressure and diabetes, and she was diagnosed with atrial fibrillation two years ago. She takes medication for all of her conditions, but she has not been very good about taking her medication consistently. She also smokes and drinks alcohol occasionally.

In addition to the symptoms that brought her to the hospital today, Mary also reports having a headache, dizziness, and nausea. She says that she feels very tired and weak. She is also having trouble swallowing.

The physical exam reveals weakness on the left side of Mary's body, and she has difficulty speaking. Her vision in her right eye is blurry. Her blood pressure is high, and her pulse is irregular. Her pupils are unequal in size.

The diagnostic tests confirm that Mary has had a recurrent ischemic stroke. She is started on medication to prevent future strokes, and she is admitted to the hospital for observation.

The doctors and nurses work with Mary to develop a treatment plan that will help her to recover from her stroke and prevent future strokes. Mary is taught about the signs and symptoms of a stroke, and she is given medication to control her blood pressure, diabetes, and atrial fibrillation. She is also encouraged to quit smoking and to eat a healthy diet.

Mary makes a good recovery from her stroke. She is able to go home from the hospital after a week. She continues to take her medication and to make healthy lifestyle changes. She is able to return to her teaching job and to her old life.

This scenario is just one example of how a patient's medical history can impact their care. By taking the time to learn about the patient's medical history, the medical student can develop a more personalized treatment plan that is more likely to be successful.

Bard – Example 2: Iteration 06

Prompt 1: Generate a scenario to train medical students for a stroke or transient ischemic attack (TIA) patient.

Output 1:

Sure, here is a scenario that you can use to train medical students for a stroke or TIA patient:

It is 13:07 PST on August 8, 2023. You are a medical student on your first day of rotation in the emergency department. You are assigned to see a patient who has come in with a complaint of sudden onset weakness on the left side of their body. The patient is a 55-year-old woman who is otherwise healthy.

You take a history from the patient and learn that she woke up this morning with weakness in her left arm and leg. She also says that she had trouble speaking and understanding what people were saying to her. The symptoms lasted for about 30 minutes and then went away.

You perform a physical examination on the patient and find that she has weakness in her left arm and leg. She also has difficulty speaking and understanding what you are saying to her. You order a CT scan of the patient's head, which shows a small stroke in the left hemisphere of her brain.

You diagnose the patient with a transient ischemic attack (TIA). A TIA is a temporary stroke that causes similar symptoms to a stroke, but the symptoms go away within 24 hours. TIAs are a warning sign that a stroke may happen in the future.

You discuss the patient's diagnosis with her and explain the importance of getting treatment to prevent a stroke. You also teach her about the signs and symptoms of a stroke so that she can seek medical attention immediately if they occur again.

Here are some of the key points that medical students should learn from this scenario:

- The signs and symptoms of a stroke or TIA:
 - Sudden weakness or numbness on one side of the body
 - Sudden difficulty speaking or understanding speech
 - Sudden trouble seeing in one or both eyes
 - Sudden dizziness, loss of balance, or coordination
 - Sudden severe headache with no known cause
- The importance of seeking medical attention immediately if you or someone you know experiences the signs or symptoms of a stroke or TIA.
- The fact that TIAs are a warning sign that a stroke may happen in the future.
- The importance of getting treatment to prevent a stroke after a TIA.
- The signs and symptoms of a stroke that medical students should teach their patients about.

I hope this scenario is helpful!

Prompt 2: For that scenario, consider a patient that has a history of an ischemic stroke within the past 3 months.

Output 2:

Sure, here is a scenario that you can use to train medical students for a stroke or TIA patient who has a history of an ischemic stroke within the past 3 months:

It is 13:07 PST on August 8, 2023. You are a medical student on your first day of rotation in the emergency department. You are assigned to see a patient who has come in with a complaint of sudden onset weakness on the left side of their body. The patient is a 55-year-old woman who had an ischemic stroke within the past 3 months.

You take a history from the patient and learn that she woke up this morning with weakness in her left arm and leg. She also says that she had trouble speaking and understanding what people were saying to her. The symptoms lasted for about 30 minutes and then went away.

You perform a physical examination on the patient and find that she has weakness in her left arm and leg. She also has difficulty speaking and understanding what you are saying to her. You order a CT scan of the patient's head, which shows a small stroke in the left hemisphere of her brain.

You diagnose the patient with a recurrent ischemic stroke. This means that she has had a stroke at least once before, and she is now having another stroke. Recurrent ischemic strokes are more common in people who have had a stroke within the past 3 months.

You discuss the patient's diagnosis with her and explain the importance of getting treatment to prevent another stroke. You also teach her about the signs and symptoms of a stroke so that she can seek medical attention immediately if they occur again.

In addition to the treatment that you would give to any patient with a stroke, you also need to take into account the fact that this patient has a history of a recent stroke. This means that you need to be extra careful with her medication and monitoring. You also need to make sure that she has a plan in place for her ongoing care, including rehabilitation and physical therapy.

Here are some of the key points that medical students should learn from this scenario:

- The risk of recurrent stroke is higher in people who have had a stroke within the past 3 months.
- The importance of getting treatment to prevent a recurrent stroke.
- The signs and symptoms of a stroke that medical students should teach their patients about.
- The importance of being extra careful with medication and monitoring in patients with a history of recent stroke.
- The importance of making sure that patients with a history of recent stroke have a plan in place for their ongoing care.

I hope this scenario is helpful!

Prompt 3: For that scenario, add more of the medical history for the patient.

Output 3:

Sure, here is the scenario with more of the medical history for the patient:

It is 13:07 PST on August 8, 2023. You are a medical student on your first day of rotation in the emergency department. You are assigned to see a patient who has come in with a complaint of sudden onset weakness on the left side of their body. The patient is a 55-year-old woman named Mary who had an ischemic stroke within the past 3 months.

You take a history from Mary and learn that she woke up this morning with weakness in her left arm and leg. She also says that she had trouble speaking and understanding what people were saying to her. The symptoms lasted for about 30 minutes and then went away.

You perform a physical examination on Mary and find that she has weakness in her left arm and leg. She also has difficulty speaking and understanding what you are saying to her. You order a CT scan of Mary's head, which shows a small stroke in the left hemisphere of her brain.

You diagnose Mary with a recurrent ischemic stroke. This means that she has had a stroke at least once before, and she is now having another stroke. Recurrent ischemic strokes are more common in people who have had a stroke within the past 3 months.

You discuss Mary's diagnosis with her and explain the importance of getting treatment to prevent another stroke. You also teach her about the signs and symptoms of a stroke so that she can seek medical attention immediately if they occur again.

In addition to the treatment that you would give to any patient with a stroke, you also need to take into account the fact that Mary has a history of a recent stroke. This means that you need to be extra careful with her medication and monitoring. You also need to make sure that she has a plan in place for her ongoing care, including rehabilitation and physical therapy.

Here is some more of Mary's medical history:

- She has high blood pressure.
- She is a smoker.
- She has a family history of stroke.
- She is overweight.

These are all risk factors for stroke. It is important to address these risk factors in order to prevent Mary from having another stroke.

I hope this scenario is helpful!

Bing Precise – Example 1: Iteration 04

Prompt 1: Generate a scenario to train medical students for a stroke or transient ischemic attack (TIA) patient.

Output 1:

Here is a scenario that could be used to train medical students for a stroke or transient ischemic attack (TIA) patient:

A 65-year-old man is brought to the emergency department by his wife. She reports that he suddenly developed slurred speech and weakness on the right side of his body while they were having breakfast. The symptoms lasted for about 10 minutes and then resolved completely. The man has a history of high blood pressure and high cholesterol, and his father had a stroke at the age of 70.

The medical student should suspect a transient ischemic attack (TIA), which is often called a "mini-stroke" or a "warning stroke." A TIA is an episode in which a person has signs or symptoms of a stroke (e.g., numbness, inability to speak) that last for a short time. Symptoms of a TIA usually last between a few minutes and a few hours, and people recover completely from the symptoms of a TIA.

The medical student should perform a thorough neurological examination and order appropriate diagnostic tests, such as brain imaging and blood tests. The student should also assess the patient's risk factors for stroke, including high blood pressure, high cholesterol, smoking, diabetes, and family history of stroke.

It is important to get medical help right away if you think you may be having a TIA or a stroke. Immediate treatment can decrease or eliminate the risk of a future stroke. The medical student should discuss with the patient and his wife the importance of managing his risk factors for stroke and the need for close follow-up with his primary care physician. The student should also educate the patient and his wife about the signs and symptoms of stroke and the importance of seeking immediate medical attention if they occur.

Prompt 2: For that scenario, consider a patient that has a history of an ischemic stroke within the past 3 months.

Output 2:

Here is a revised scenario that takes into account the patient's history of an ischemic stroke within the past 3 months:

A 65-year-old man with a history of an ischemic stroke within the past 3 months is brought to the emergency department by his wife. She reports that he suddenly developed slurred speech and weakness on the right side of his body while they were having breakfast. The symptoms lasted for about 10 minutes and then resolved completely. The man has a history of high blood pressure and high cholesterol, and his father had a stroke at the age of 70.

The medical student should suspect a transient ischemic attack (TIA), which is often called a "mini-stroke" or a "warning stroke." A TIA is an episode in which a person has signs or symptoms of a stroke (e.g., numbness, inability to speak) that last for a short time. Symptoms of a TIA usually last between a few minutes and a few hours, and people recover completely from the symptoms of a TIA.

The medical student should perform a thorough neurological examination and order appropriate diagnostic tests, such as brain imaging and blood tests. The student should also assess the patient's risk factors for stroke, including high blood pressure, high cholesterol, smoking, diabetes, and family history of stroke.

It is important to get medical help right away if you think you may be having a TIA or a stroke. Immediate treatment can decrease or eliminate the risk of a future stroke. The medical student should discuss with the patient and his wife the importance of managing his risk factors for stroke and the need for close follow-up with his primary care physician. The student should also educate the patient and his wife about the signs and symptoms of stroke and the importance of seeking immediate medical attention if they occur.

Given the patient's history of an ischemic stroke within the past 3 months, it is important to carefully monitor his condition and ensure that he receives appropriate treatment to prevent another stroke. This may include medications to control high blood pressure and cholesterol levels, as well as lifestyle changes such as quitting smoking, eating a healthy diet, and exercising regularly.

297

298 *Prompt 3:* For that scenario, add more of the medical history for the patient.

299 *Output 3:*

300

301 Here is a revised scenario that takes into account the patient's medical history:

302 A 65-year-old man with a history of an ischemic stroke within the past 3 months, high blood pressure,
303 high cholesterol, and type 2 diabetes is brought to the emergency department by his wife. She reports
304 that he suddenly developed slurred speech and weakness on the right side of his body while they were
305 having breakfast. The symptoms lasted for about 10 minutes and then resolved completely. The man's
306 father had a stroke at the age of 70.

307 The medical student should suspect a transient ischemic attack (TIA), which is often called a "mini-
308 stroke" or a "warning stroke." A TIA is an episode in which a person has signs or symptoms of a stroke
309 (e.g., numbness, inability to speak) that last for a short time. Symptoms of a TIA usually last between a
310 few minutes and a few hours, and people recover completely from the symptoms of a TIA.

311 The medical student should perform a thorough neurological examination and order appropriate
312 diagnostic tests, such as brain imaging and blood tests. The student should also assess the patient's risk
313 factors for stroke, including high blood pressure, high cholesterol, smoking, diabetes, and family history
314 of stroke.

315 It is important to get medical help right away if you think you may be having a TIA or a stroke.
316 Immediate treatment can decrease or eliminate the risk of a future stroke. The medical student should
317 discuss with the patient and his wife the importance of managing his risk factors for stroke and the need
318 for close follow-up with his primary care physician. The student should also educate the patient and his
319 wife about the signs and symptoms of stroke and the importance of seeking immediate medical
320 attention if they occur.

321 Given the patient's history of an ischemic stroke within the past 3 months, it is important to carefully
322 monitor his condition and ensure that he receives appropriate treatment to prevent another stroke. This
323 may include medications to control high blood pressure, cholesterol levels, and blood sugar levels, as
324 well as lifestyle changes such as quitting smoking, eating a healthy diet, and exercising regularly.

325

326 **Bing Precise – Example 2: Iteration 08**

327

328 *Prompt 1:* Generate a scenario to train medical students for a stroke or transient ischemic attack (TIA) patient.

329 *Output 1:*

330

331 Here is a scenario that can be used to train medical students for a stroke or transient ischemic attack
332 (TIA) patient:

A 65-year-old man is brought to the emergency department by his wife. She reports that he suddenly developed weakness on the right side of his body and slurred speech while they were having breakfast. The symptoms lasted for about 10 minutes and then resolved completely. The man has a history of high blood pressure and high cholesterol, and his father had a stroke at the age of 70.

The medical student should suspect a transient ischemic attack (TIA), which is often called a "mini-stroke" or a "warning stroke." A TIA is caused by a temporary disruption of blood flow to the brain, and its symptoms are similar to those of a stroke but last for a shorter time and do not cause permanent damage. However, TIAs are important warning signs that a person may be at high risk for a stroke.

The medical student should perform a thorough neurological examination, including an assessment of the patient's strength, sensation, coordination, and speech. They should also order appropriate diagnostic tests, such as brain imaging and blood tests, to determine the cause of the TIA and assess the patient's risk for a future stroke. The student should also discuss with the patient and his wife the importance of managing risk factors for stroke, such as high blood pressure and high cholesterol, and provide them with information on lifestyle changes and medications that can help reduce their risk. Finally, the student should arrange for appropriate follow-up care to monitor the patient's condition and prevent future TIAs or strokes.

Prompt 2: For that scenario, consider a patient that has a history of an ischemic stroke within the past 3 months.

Output 2:

Here is a revised scenario that can be used to train medical students for a stroke or transient ischemic attack (TIA) patient with a history of an ischemic stroke within the past 3 months:

A 65-year-old man with a history of an ischemic stroke within the past 3 months is brought to the emergency department by his wife. She reports that he suddenly developed weakness on the right side of his body and slurred speech while they were having breakfast. The symptoms lasted for about 10 minutes and then resolved completely. The man has a history of high blood pressure and high cholesterol, and his father had a stroke at the age of 70.

The medical student should suspect a transient ischemic attack (TIA), which is often called a "mini-stroke" or a "warning stroke." A TIA is caused by a temporary disruption of blood flow to the brain, and its symptoms are similar to those of a stroke but last for a shorter time and do not cause permanent damage. However, TIAs are important warning signs that a person may be at high risk for a stroke.

Given the patient's history of an ischemic stroke within the past 3 months, the medical student should be particularly vigilant in their assessment and management. They should perform a thorough neurological examination, including an assessment of the patient's strength, sensation, coordination, and speech. They should also order appropriate diagnostic tests, such as brain imaging and blood tests, to determine the cause of the TIA and assess the patient's risk for a future stroke. The student should also review the patient's current medications and management plan for their previous ischemic stroke to ensure that they are receiving optimal care.

The student should discuss with the patient and his wife the importance of managing risk factors for stroke, such as high blood pressure and high cholesterol, and provide them with information on lifestyle changes and medications that can help reduce their risk. Finally, the student should arrange for appropriate follow-up care to monitor the patient's condition and prevent future TIAs or strokes.

Prompt 3: For that scenario, add more of the medical history for the patient.

Output 3:

Here is a revised scenario that includes more of the patient's medical history:

A 65-year-old man with a history of an ischemic stroke within the past 3 months is brought to the emergency department by his wife. She reports that he suddenly developed weakness on the right side of his body and slurred speech while they were having breakfast. The symptoms lasted for about 10 minutes and then resolved completely. The man has a history of high blood pressure, high cholesterol, and type 2 diabetes, and his father had a stroke at the age of 70. He is currently taking medications to manage his blood pressure, cholesterol, and blood sugar levels.

The medical student should suspect a transient ischemic attack (TIA), which is often called a "mini-stroke" or a "warning stroke." A TIA is caused by a temporary disruption of blood flow to the brain, and its symptoms are similar to those of a stroke but last for a shorter time and do not cause permanent damage. However, TIAs are important warning signs that a person may be at high risk for a stroke.

Given the patient's history of an ischemic stroke within the past 3 months and his other medical conditions, the medical student should be particularly vigilant in their assessment and management. They should perform a thorough neurological examination, including an assessment of the patient's strength, sensation, coordination, and speech. They should also order appropriate diagnostic tests, such as brain imaging and blood tests, to determine the cause of the TIA and assess the patient's risk for a future stroke. The student should also review the patient's current medications and management plan for their previous ischemic stroke, high blood pressure, high cholesterol, and type 2 diabetes to ensure that they are receiving optimal care.

The student should discuss with the patient and his wife the importance of managing risk factors for stroke, such as high blood pressure, high cholesterol, and diabetes, and provide them with information on lifestyle changes and medications that can help reduce their risk. Finally, the student should arrange for appropriate follow-up care to monitor the patient's condition and prevent future TIAs or strokes.

ChatGPT-4 – Example 1: Iteration 01

Prompt 1: Generate a scenario to train medical students for a stroke or transient ischemic attack (TIA) patient.

Output 1:

****Scenario: Stroke/TIA Patient Simulation for Medical Students****

409 ---

410 ****Objective:****

411 To prepare medical students to efficiently recognize, diagnose, and initiate treatment for patients
412 presenting with symptoms of a stroke or TIA.

413

414 ****Setting:****

415 A high-fidelity simulation lab replicating an Emergency Room (ER) setting, complete with patient bed,
416 medical equipment, and a manikin (or standardized patient) to represent the stroke/TIA patient.

417

418 ****Equipment:****

- 419 - High-fidelity manikin or standardized patient (SP)
- 420 - Blood pressure cuff, stethoscope, pulse oximeter, ECG leads
- 421 - Neurological testing tools (pin, cotton ball, flashlight, etc.)
- 422 - Computer or display for vital sign monitoring and radiological images

423

424 ****Background:****

425 The simulated patient is a 65-year-old male with a history of hypertension, smoking, and type 2
426 diabetes. He presents to the ER via ambulance after his wife noticed sudden onset of slurred speech and
427 weakness in his right arm.

428 ---

429 ****Case Progression:****

430

431 1. ****Presentation:****

- 432 - Vital signs: BP 185/95 mmHg, HR 88 bpm, O2 sat 98%, RR 16/min.
- 433 - Symptoms: Slurred speech, right arm weakness, confusion, and headache.
- 434 - Patient (or wife) reports that the symptoms started roughly an hour ago while they were having
435 breakfast.

436

437 2. ****Physical Examination:****

- 438 - Unequal grip strength between the two hands.

- Facial droop on the right side.
- Slurred speech with difficulty in finding words.
- Diminished sensation to light touch on the right arm.
- Normal pupils but a slight delay in the right pupil reacting to light.

3. ****Investigations:****

- ECG to rule out atrial fibrillation or other abnormalities.
- Non-contrast CT scan shows no hemorrhage, but there are signs consistent with early ischemic changes.
- Blood tests: Elevated blood glucose, normal complete blood count, and coagulation profile.

4. ****Management & Treatment Decisions:****

- The student should decide on the initiation of thrombolytic therapy based on the window period and other contraindications.
- Address other issues such as elevated blood pressure and blood sugar.
- Consider admission to a stroke unit or ICU, and discuss potential interventions, monitoring, and post-stroke rehabilitation.

****Debriefing:****

After the scenario, gather the medical students for a discussion.

- ****What went well?**** Review the aspects where the students excelled.
- ****What could have been done differently?**** Discuss missed opportunities or mistakes.
- ****Key Learning Points:****
 1. Importance of time – the "Golden Hour" in stroke management.
 2. Differentiating between stroke and TIA.
 3. Understanding risk factors.
 4. How to conduct a focused neurological exam.
 5. Interpreting relevant investigations.

6. Considerations before initiating thrombolytic therapy.

7. Addressing secondary issues and complications.

This scenario will help students integrate their theoretical knowledge with clinical skills, enabling them to handle real-life cases with more confidence and competence.

Prompt 2: For that scenario, consider a patient that has a history of an ischemic stroke within the past 3 months.

Output 2:

****Scenario: Stroke/TIA Patient Simulation for Medical Students with a Recent Ischemic Stroke History****

****Objective:****

To prepare medical students to recognize, diagnose, and manage complications and recurrent symptoms in patients with a recent history of ischemic stroke.

****Setting:****

A high-fidelity simulation lab replicating an Emergency Room (ER) setting, complete with patient bed, medical equipment, and a manikin (or standardized patient) to represent the stroke/TIA patient.

****Equipment:****

- High-fidelity manikin or standardized patient (SP)
- Blood pressure cuff, stethoscope, pulse oximeter, ECG leads
- Neurological testing tools (pin, cotton ball, flashlight, etc.)
- Computer or display for vital sign monitoring and radiological images

****Background:****

The simulated patient is a 67-year-old female who had an ischemic stroke 3 months ago. She is on aspirin and statins. She presents to the ER with sudden onset of visual disturbances and difficulty walking.

****Case Progression:****

500

501 1. **Presentation:**

502 - Vital signs: BP 170/90 mmHg, HR 92 bpm, O2 sat 97%, RR 17/min.

503 - Symptoms: Visual disturbances described as a "curtain dropping" over one eye (amaurosis fugax)
504 and unsteady gait.

505 - Patient reports she noticed these symptoms when she was reading a magazine about 30 minutes
506 ago.

507

508 2. **Physical Examination:**

509 - Loss of vision in the left eye.

510 - Ataxic gait.

511 - The rest of the neurological examination, including speech, strength, sensation, and facial symmetry,
512 is normal.

513 - Carotid bruits are noted on auscultation.

514

515 3. **Investigations:**

516 - ECG to rule out atrial fibrillation or other abnormalities.

517 - Non-contrast CT scan does not show new hemorrhage or infarct.

518 - Carotid Doppler ultrasound reveals significant stenosis in the left carotid artery.

519 - Blood tests: Lipid profile shows elevated LDL cholesterol.

520

521 4. **Management & Treatment Decisions:**

522 - Students should recognize this as a potential TIA or a warning sign of an impending stroke due to
523 carotid artery disease.

524 - Decision regarding further management, such as carotid endarterectomy or angioplasty, based on
525 the degree of stenosis and other risk factors.

526 - Review and potentially optimize secondary stroke prevention measures, such as adjusting statin
527 therapy, considering anticoagulation, and managing other modifiable risk factors.

528 ---

529 **Debriefing:**

530

531 After the scenario, gather the medical students for a discussion.

532

533 - **What went well?** Review where the students performed optimally.

534 - **What could have been done differently?** Highlight missed opportunities or errors.

535 - **Key Learning Points:**

536 1. Recognizing symptoms of TIA and its significance.

537 2. Understanding the implications of carotid artery disease.

538 3. The importance of secondary stroke prevention.

539 4. Identifying and managing modifiable risk factors post-stroke.

540 5. Decision-making regarding surgical interventions for stroke prevention.

541 ---

542 With this scenario, medical students will gain an appreciation of the nuances in managing patients with
543 a recent history of ischemic stroke and the importance of early detection and intervention in secondary
544 stroke prevention.

545

546 *Prompt 3:* For that scenario, add more of the medical history for the patient.

547 *Output 3:*

548

549 **Scenario: Stroke/TIA Patient Simulation for Medical Students with a Recent Ischemic Stroke History**
550 **and a Detailed Medical Background**

551 ---

552 **Objective:**

553 To train medical students to integrate complex medical history when evaluating and managing a patient
554 with potential recurrent stroke or TIA symptoms.

555

556 **Setting:**

557 A high-fidelity simulation lab replicating an Emergency Room (ER) setting.

558

559 **Equipment:**

560 - High-fidelity manikin or standardized patient (SP)

561 - Blood pressure cuff, stethoscope, pulse oximeter, ECG leads

- Neurological testing tools (pin, cotton ball, flashlight, etc.)
- Computer or display for vital sign monitoring and radiological images

564

565 ****Background:****

566 The simulated patient is a 67-year-old female named Mrs. Robinson.

567

568 ****Medical History:****

- Ischemic stroke 3 months ago, with mild residual left-hand weakness.
- Hypertension controlled with lisinopril.
- Type 2 diabetes managed with metformin.
- Atrial fibrillation - on apixaban (anticoagulant).
- Previous smoker, quit 10 years ago.
- Osteoarthritis of the knees, managed with occasional acetaminophen.
- Family history of cardiovascular disease: Her father had a heart attack at age 60, and her sister had a stroke at age 65.

577

578 Mrs. Robinson presents to the ER with sudden visual disturbances and difficulty walking.

579 ---

580 ****Case Progression:****

581

582 1. ****Presentation:****

- Vital signs: BP 170/90 mmHg, HR 92 bpm (irregularly irregular), O2 sat 97%, RR 17/min.
- Symptoms as described in the previous scenario.

585

586 2. ****Physical Examination:****

- Findings as detailed in the previous scenario, plus mild residual weakness in the left hand from the previous stroke.

589

590 3. ****Investigations:****

- As mentioned in the previous scenario.

- Additional: HbA1c reveals poor glycemic control.

4. **Management & Treatment Decisions:**

- As mentioned in the previous scenario.

- Reassess anticoagulation given her history of atrial fibrillation and recurrent symptoms.

- Evaluate for potential drug interactions and ensure that her medications are optimized for her multiple co-morbidities.

Debriefing:

- Review the scenario and discuss the importance of integrating the detailed medical history into clinical decision-making.

- Emphasize the complexities of managing patients with multiple co-morbidities and how they intersect with acute events like TIA.

- Discuss the importance of optimizing chronic disease management to prevent recurrent events.

This enhanced scenario will provide medical students with a deeper understanding of how a patient's extensive medical history can impact acute care decisions and long-term management strategies.

ChatGPT-4 – Example 2: Iteration 06

Prompt 1: Generate a scenario to train medical students for a stroke or transient ischemic attack (TIA) patient.

Output 1:

Scenario

Stroke/TIA Simulation Scenario for Medical Students

Objective:

Train medical students to identify and manage a patient presenting with symptoms suggestive of a stroke or transient ischemic attack (TIA).

623 ****Materials Needed:****

- 624 1. High-fidelity mannequin or standardized patient (actor)
- 625 2. Simulation room set up as an emergency department room
- 626 3. Monitors displaying vital signs
- 627 4. Neurological assessment tools (torch, tuning fork, reflex hammer)
- 628 5. Mock imaging suite or imaging results (e.g., CT or MRI scans)
- 629 6. Stopwatch or timer

630

631 ****Briefing:****

632 Inform students they will be presented with a patient who might be experiencing a stroke or TIA. The
633 aim is to accurately identify the condition, ensure appropriate immediate care, and decide on
634 subsequent steps in management.

635

636 ****Scenario Script:****

637

638 1. ****Presenting Complaint:****

639 - Patient/Mannequin is a 65-year-old male named Mr. Thompson who arrives at the ED with a
640 complaint of sudden-onset weakness in his right arm and slurred speech that started 45 minutes ago.

641

642 2. ****History:****

643 - Denies headache, chest pain, or any other associated symptoms.

644 - Has a history of hypertension and type 2 diabetes.

645 - Takes metformin and lisinopril.

646 - Smokes 10 cigarettes a day and drinks alcohol socially.

647

648 3. ****Vital Signs:****

649 - Blood pressure: 180/100 mmHg

650 - Heart rate: 85 bpm

651 - Respiratory rate: 18 breaths/min

652 - Oxygen saturation: 98% on room air

653 - Temperature: 98.6°F (37°C)

654

655 4. ****Physical Examination:****

656 - Alert and oriented x3 (person, place, time).

657 - Slurred speech.

658 - Right facial droop.

659 - Strength 2/5 in the right upper extremity, 4/5 in the right lower extremity, 5/5 on the left side.

660 - Normal sensory exam.

661 - Reflexes: brisk on the affected side.

662 - Normal cardiac, respiratory, and abdominal exam.

663

664 5. ****Investigations:****

665 - ECG shows normal sinus rhythm.

666 - Bloodwork including complete blood count, electrolytes, and coagulation profile can be simulated as
667 normal or with minor deviations.

668 - Mock CT scan without any visible early ischemic changes or hemorrhage.

669

670 ****Debrief and Learning Points:****

671 After the simulation, review the scenario with the students. Discuss:

672

673 1. ****Recognition of Stroke/TIA:****

674 - Importance of time and the phrase "time is brain".

675 - Elicitation of onset time.

676 - Recognition of risk factors.

677

678 2. ****Management:****

679 - Importance of quick neurological assessment.

680 - Blood pressure management: when to treat and potential dangers.

- Immediate management steps for stroke or TIA including potential thrombolysis or thrombectomy considerations.

- Role of imaging in stroke.

3. **Secondary Prevention:**

- Addressing modifiable risk factors (hypertension, diabetes, smoking).

- Appropriate referral to neurology or stroke clinic.

- Importance of patient and family education.

4. **Communication Skills:**

- Effective communication with the patient, family, and healthcare team.

Encourage students to ask questions, reflect on their actions, and consider how they would manage similar situations in the future.

Prompt 2: For that scenario, consider a patient that has a history of an ischemic stroke within the past 3 months.

Output 2:

Revised Scenario for a Patient with Recent History of Ischemic Stroke

Objective:

Train medical students to identify and manage a patient with a recent history of ischemic stroke presenting with symptoms suggestive of a recurrent stroke or TIA.

Materials Needed:

1. High-fidelity mannequin or standardized patient (actor)
2. Simulation room set up as an emergency department room
3. Monitors displaying vital signs
4. Neurological assessment tools (torch, tuning fork, reflex hammer)
5. Mock imaging suite or imaging results (e.g., CT or MRI scans)

711 6. Stopwatch or timer

712

713 ****Briefing:****

714 Inform students that they will be presented with a patient with a history of recent ischemic stroke and
715 who might be experiencing a recurrent stroke or TIA. The aim is to accurately identify the condition,
716 ensure appropriate immediate care, and decide on subsequent steps in management.

717

718 ****Scenario Script:****

719

720 1. ****Presenting Complaint:****

721 - Patient/Mannequin is a 67-year-old female named Mrs. Davis who arrives at the ED with a complaint
722 of sudden-onset weakness in her left leg and difficulty finding words that started 1 hour ago.

723

724 2. ****History:****

725 - Mrs. Davis had an ischemic stroke 3 months ago and had residual mild right arm weakness post that
726 event.

727 - Denies headache, chest pain, or any other associated symptoms.

728 - Has a history of hypertension, atrial fibrillation, and hyperlipidemia.

729 - Medications: Warfarin, atorvastatin, and metoprolol.

730 - Non-smoker and drinks alcohol occasionally.

731

732 3. ****Vital Signs:****

733 - Blood pressure: 170/95 mmHg

734 - Heart rate: 76 bpm (irregularly irregular)

735 - Respiratory rate: 16 breaths/min

736 - Oxygen saturation: 98% on room air

737 - Temperature: 98.4°F (36.9°C)

738

739 4. ****Physical Examination:****

740 - Alert and oriented x3 (person, place, time).

- Expressive aphasia.

- Strength 4/5 in the right upper extremity (known residual weakness), 0/5 in the left lower extremity, 5/5 in the right lower extremity and left upper extremity.

- Normal sensory exam.

- Reflexes: brisk on the affected side.

- Irregularly irregular pulse with normal cardiac, respiratory, and abdominal exam.

5. ****Investigations:****

- ECG confirms atrial fibrillation.

- Bloodwork shows elevated INR (due to warfarin).

- Mock CT scan without any visible early ischemic changes or hemorrhage.

****Debrief and Learning Points:****

After the simulation, review the scenario with the students:

1. ****Recognition of Recurrent Stroke/TIA in Patients with Previous Stroke:****

- Importance of discerning new neurological deficits from residual deficits.

- Assessing for common causes of recurrent stroke (e.g., atrial fibrillation).

- Importance of onset time and potential challenges with thrombolysis due to contraindications.

2. ****Management:****

- Detailed assessment considering prior deficits.

- Evaluating the benefits and risks of treatments, especially when the patient is on anticoagulation.

- Role of imaging in recurrent stroke and evaluating the old infarct site.

3. ****Secondary Prevention and Medication Management:****

- Addressing compliance and effectiveness of current medications.

- Potential need for changes in anticoagulation or other medications based on the clinical scenario.

- Continued emphasis on risk factor modification.

770

771 4. ****Communication Skills:****

772 - Navigating complex histories and communicating with a patient with aphasia.

773 - Discussing recurrent stroke risks and concerns with patients and families.

774

775 Encourage reflection, questions, and critical thinking about the unique challenges in managing patients
776 with prior strokes.

777

778 *Prompt 3:* For that scenario, add more of the medical history for the patient.

779 *Output 3:*

780

781 ****Extended Medical History for Mrs. Davis in the Revised Scenario****

782

783 ****Scenario Script Update:****

784

785 1. ****Presenting Complaint:****

786 - Patient/Mannequin is a 67-year-old female named Mrs. Davis who arrives at the ED with a complaint
787 of sudden-onset weakness in her left leg and difficulty finding words that started 1 hour ago.

788

789 2. ****Medical History:****

790 - ****Past Medical History:****

791 - Ischemic stroke 3 months ago with residual mild right arm weakness.

792 - Hypertension diagnosed 10 years ago.

793 - Atrial fibrillation diagnosed 5 years ago.

794 - Hyperlipidemia diagnosed 8 years ago.

795 - Type 2 diabetes mellitus for 6 years, diet-controlled.

796 - Osteoarthritis in both knees.

797 - Hypothyroidism controlled on levothyroxine.

798 - History of breast cancer treated with lumpectomy and radiation 7 years ago, currently in remission.

799 - ****Medications:****

800 - Warfarin
801 - Atorvastatin
802 - Metoprolol
803 - Levothyroxine
804 - Occasional paracetamol for knee pain.
805 - **Allergies:**
806 - Penicillin causes a rash.
807 - **Family History:**
808 - Father had a myocardial infarction at age 72.
809 - Mother had hypertension and died from complications of Alzheimer's disease.
810 - Younger brother has Type 2 diabetes and had a stroke at 65.
811 - **Social History:**
812 - Lives with her retired husband in a bungalow.
813 - Two adult children living out of state.
814 - Non-smoker and drinks alcohol occasionally, about a glass of wine once a week.
815 - Active in her local church community and loves gardening.
816 - No recent travel, and no pets at home.
817 - **Review of Systems:**
818 - Denies headache, chest pain, dizziness, visual changes, or any other associated symptoms.
819 - Reports occasional nocturia, but no dysuria or hematuria.
820 - No GI symptoms. Appetite has been stable.
821 - No recent weight loss or gain.
822
823 **Debrief and Learning Points:**
824 (No change from the previously mentioned debrief points.)
825
826 Incorporating a detailed medical history allows for more complexity in the scenario, challenging the
827 students' clinical reasoning skills. It emphasizes the importance of taking a comprehensive history,
828 especially when evaluating high-risk patients with multiple comorbidities. This extended history also

829 introduces potential confounding factors and differential diagnoses based on the patient's background
830 and symptoms.