

AI as a Socratic Tutor: Using AI to Generate Questions and Answers Regarding the Relationship Between Patient and Doctor

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Abstract

The paper uses artificial intelligence (AI) accessed through the Idea Coach feature of the Mind Genomics platform, BimiLeap.com, to create a tutoring system focusing on AI as a coach regarding the relationship between healthcare professionals and patients. The paper is divided into four sections. Section 1 presents a short “history” (more accurately, a projection) of AI in patient-centered medicine, written from the vantage point of 2035, focusing on the achievements of the past ten years (2025–2035). Section 2 presents 30 simulated short chats between a doctor and a patient and serves as a tutorial. Section 3 presents 20 questions generated and answered by AI. The questions are often unexpected, showing AI’s value in opening new areas. Section 4 closes the paper with AI asking about the next 100 years, from 2035 to 2135, showing that AI can ask questions but avoids making specific predictions.

Keywords: Mind Genomics, Socratic Tutoring, Doctor-patient Communication, Patient-Centered Medicine, AI Simulations.

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Introduction

Artificial intelligence (AI) is revolutionizing how medical professionals communicate with patients. By providing simulations and real-time feedback, AI can help medical students practice their bedside manner, empathize with patients, and build confidence. Virtual reality simulations can help medical students practice active listening, empathy, and rapport-building. AI can also analyze patient data to provide insights into their preferences, needs, and concerns. This allows medical professionals to tailor their interactions to meet individual patient needs. AI can also educate non-medical staff on effective communication strategies, leading to improved patient outcomes and increased satisfaction. As AI advances, it will be crucial in shaping patient-centered care. Patients

will appreciate the efforts made by medical professionals to enhance their communication skills, leading to a more compassionate and effective care [1-10].

This paper provides a multifaceted treatment of AI, using it to evaluate itself and predict its future in patient-healthcare professional relationships. These four topics illustrate the power of AI in medicine:

1. Looking backward – instructing AI to provide a “history” of the near future by assuming it is writing a history of what happened between 2025 and 2035. This approach is modeled after Edward Bellamy’s futuristic 1875 novel Looking Backward.
2. Using AI to create Socratic simulations that enhance communication, specifically

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- by simulating interactions between patients and doctors.
3. Using AI to generate and answer questions involving the use of AI in medicine.
 4. “Looking backward” from 2035 to 2135, asking questions about the role of AI.

“Looking Backward”

The “looking backward” approach is taken from a novel of the same name by Edward Bellamy, written in the last part of the 19th century. The idea was to predict the future and write

it as history. The value of the looking-backward approach in predicting the achievements of AI in medicine from 2025 to 2035 lies in its ability to bring the future to life in a tangible and relatable way, whether or not the details are factually accurate. By reflecting on the advancements over the past ten years, we can better understand the trajectory of innovation and progress in the healthcare field. This approach allows us to envision a future in which AI has revolutionized patient care, diagnostics, and treatment methods and it can help us prepare for upcoming challenges and opportunities [11-14] (see Table 1).

Table 1: The “looking backward approach applied to 2025-2035 and particularized to AI used to improve healthcare professionals’ relationship with patients.

The prompt is provided to the Idea Coach feature of the BimiLeap.com platform.

The year is 2035. AI has been used in the medical field since 2022 as a popular tool for training and diagnosis. You are a writer and have been hired to write a story for a web channel specializing in medical content. This web channel is exceptionally popular and widely listened to by medical professionals, medical students, the general public, and government policymakers.

This issue concerns the impact of AI on medicine, particularly the relationship between patients and medical professionals. Write your story, be accurate, and tell us what has transpired since 2025 during the past 10 years. Be transparent and judgmental.

The AI-generated story for the “Looking Backward” effort

In 2035, AI’s application in medicine revolutionized how healthcare professionals approach patient care. Since its introduction in 2025, AI has become an invaluable tool for diagnosing diseases, predicting outcomes, and even assisting in surgical procedures. Medical students now train alongside AI systems, learning to interpret data and develop treatment plans with the help of advanced algorithms. This has significantly improved the accuracy and efficiency of medical diagnoses, ultimately saving lives and reducing the incidence of medical errors.

The integration of AI in healthcare has also greatly impacted the relationship between patients and medical professionals. Patients can access personalized treatment plans tailored to their unique health data, resulting in more effective, individualized care. On the other hand, medical professionals have more time to focus on patient communication and emotional support as AI systems increasingly handle routine tasks. This has strengthened the bond between patients and healthcare providers, fostering a sense of trust and collaboration in the medical setting.

One of the key challenges the healthcare industry has faced over the past decade is navigating the ethical implications of AI in medicine. As AI systems become more advanced, questions surrounding patient privacy, data security, and algorithm bias have arisen. Government policies have been implemented to ensure that AI in healthcare is used responsibly and ethically, with strict guidelines governing patient data collection, storage, and sharing. This has helped address concerns about the potential misuse of AI in medicine, safeguard patient rights, and ensure transparency in medical decision-making.

Despite these challenges, AI has undeniably transformed the field of medicine in previously unimaginable ways. Medical professionals now have access to vast amounts of data and insights, enabling them to make more informed decisions and provide better patient care. AI has also played a significant role in accelerating medical research and drug development, leading to the discovery of new treatments and therapies for a wide range of diseases.

In telemedicine, AI has enabled healthcare professionals to reach patients in remote areas and provide virtual consultations and monitoring. This has dramatically improved access to healthcare for individuals who may not have access to traditional medical facilities, ultimately leading to better health outcomes for underserved populations. The use of AI in telemedicine has also reduced healthcare costs and improved efficiency in delivering medical services, making healthcare more accessible and affordable for all.

As AI continues to evolve and revolutionize the field of medicine, healthcare professionals must adapt and embrace the changes brought about by this technology. Continuing education and training programs have been established to ensure medical professionals possess the necessary skills and knowledge to utilize AI in their practice effectively. The collaboration between human expertise and artificial intelligence has proven to be a powerful combination, enhancing the quality of care and improving patient outcomes.

In conclusion, the impact of AI on medicine over the past 10 years has been profound, reshaping the way healthcare is delivered and transforming the patient-provider relationship. While there are challenges and ethical considerations to navigate, the benefits of AI in healthcare are undeniable. By responsibly and ethically harnessing the power of AI technology, we have the potential to revolutionize healthcare on a global scale, improving the lives of countless individuals and driving progress in the field of medicine. As we look to the future, the possibilities for AI in healthcare are endless, and the potential for innovation and discovery is limitless.

Using AI to Create Socratic Simulations Between Patient and Doctor

Building Socratic simulations with AI is a good way to improve conversation, especially between patients and doctors. By participating in these scenarios, doctors can put themselves in their patients' shoes and improve their ability to understand, listen, and talk to them. Professionals can learn to simulate different situations to enhance their ability to react thoughtfully and sensitively to patient concerns. In the end, this can contribute to greater patient satisfaction and improved health outcomes. Because these simulations make it possible to represent a patient's thoughts more accurately, healthcare professionals can learn more about their unique point of view. When medical staff understand the thoughts, feelings, and worries that patients may

be experiencing, they can change how they communicate with each other to deal with these core problems effectively. As a result, stronger relationships between patients and their doctors, increased trust, and better healthcare outcomes may follow.

In healthcare education and training programs, these simulations can help new professionals quickly improve their interpersonal skills when interacting with patients. By creating a safe space where people can practice and receive feedback on their communication strategies, these models help them feel more confident and skilled in their patient interactions. Through this process, healthcare workers can better handle the complicated nature of patient care and build trusting relationships with their patients [15-22] (see Table 2).

Table 2: Using AI to create Socratic simulations between patient and doctor.

The prompt provided to the Idea Coach feature of the BimiLeap.com platform to create Socratic Simulations

AI can be used to create Socratic simulations that enhance communication, specifically by simulating interactions between patients and doctors. Show the patient's presenting complaints, the doctor's thoughts, statements to the patient, the patient's thoughts about what the doctor said, and a discussion of the interaction.

The AI-generated Socratic Simulations

Simulation 1

Patient: "I've been feeling exhausted lately and having trouble sleeping."

Doctor thinks: This patient may be experiencing insomnia symptoms or another underlying issue.

Doctor: "Let's discuss your sleep patterns in more detail and run some tests to determine the cause."

Patient's thought: I hope the doctor can help me figure out what's causing my fatigue and insomnia.

Discussion: This interaction demonstrates good communication between the patient and the doctor. The doctor takes the patient's concerns seriously and proposes the next steps for further evaluation and treatment.

Simulation 2

Patient: "I have been experiencing sharp pain in my chest whenever I exert myself."

Doctor thinks: This patient may be at risk for cardiovascular issues and would require immediate attention.

Doctor: "Based on your symptoms, we need to conduct some tests to rule out any issues with your heart. Let's schedule a stress test."

Patient's thought: I hope it's nothing serious, but I'm glad the doctor takes my symptoms seriously.

Discussion: In this scenario, the doctor is taking proactive measures to investigate the patient's symptoms and determine the underlying cause of chest pain, showing a commitment to providing thorough care.

Simulation 3

Patient: "I've been feeling down and hopeless lately. I think I might be depressed."

Doctor thinks: This patient may be experiencing symptoms of depression and would benefit from a mental health assessment.

Doctor: "It's important to address your mental health concerns. Let's explore therapy options and discuss the possibility of medication."

Patient's thought: I'm relieved to have opened up about my feelings and trust the doctor to help me navigate this difficult time.

Discussion: The doctor's response to the patient's disclosure of depressive symptoms shows empathy and a willingness to address mental health concerns, which can help promote overall well-being and healing.

Simulation 4

Patient: "I'm having trouble managing my diabetes and sticking to my treatment plan."

Doctor thinks: This patient may benefit from additional education and support to help better manage their diabetes.

Doctor: "Let's review your diabetes management plan and explore ways to improve your adherence. I can also refer you to a diabetes educator for further guidance."

Patient's thought: I appreciate the doctor's willingness to help me improve my diabetes management and support my overall health.

Discussion: By acknowledging the patient's struggles and offering resources for additional support, the doctor adopts a collaborative approach to effectively addressing the patient's diabetes management challenges.

Simulation 5

Patient: "I'm experiencing severe allergies that are interfering with my daily life."

Doctor thinks: This patient may benefit from allergy testing to identify specific triggers and develop a targeted treatment plan.

Doctor: "Let's discuss your allergy symptoms and consider allergy testing to identify your triggers. In the meantime, I can also recommend over-the-counter medications."

Patient's thought: I hope the doctor can help me identify what's causing my allergies so I can find some relief.

Discussion: By proposing allergy testing and discussing treatment options, the doctor is taking steps to help patients effectively manage their allergies, improving their quality of life.

Simulation 6

Patient: "I've been experiencing frequent headaches and migraines that are impacting my daily activities."

Doctor thinks: This patient may be suffering from chronic migraines and would benefit from a comprehensive evaluation and treatment plan.

Doctor: "Let's thoroughly evaluate your headaches and migraines to determine the underlying cause. We can explore medication options and lifestyle modifications to manage your symptoms."

Patient's thought: I'm hopeful that the doctor can help me find a solution to my chronic headaches and migraines.

Discussion: The doctor's approach to evaluating the patient's headaches and migraines demonstrates a commitment to identifying the root cause of the symptoms and developing a personalized treatment plan for optimal management.

Simulation 7

Patient: "I'm having trouble breathing and have been coughing a lot lately."

Doctor thinks: This patient may be experiencing respiratory issues that require immediate attention and further investigation.

Doctor: "Let's conduct a physical exam and some tests to assess your breathing difficulties. I may also refer you to a pulmonologist for further evaluation."

Patient's thought: I'm concerned about my breathing problems but trust the doctor to help me understand them.

Discussion: The doctor's proactive approach to evaluating the patient's breathing difficulties and potential referral to a specialist demonstrates a commitment to thorough assessment and appropriate management of respiratory issues.

Simulation 8

Patient: "I've noticed some unusual lumps in my breast, and I'm concerned it could be cancer."

Doctor thinks: This patient may have discovered a concerning breast lump that warrants immediate evaluation and testing.

Doctor: "Let's schedule a mammogram and biopsy to determine the nature of the lumps. Early detection is key in addressing any potential concerns."

Patient's thought: I'm scared about the possibility of breast cancer, but I'm grateful that the doctor is taking my concerns seriously.

Discussion: By recommending further testing and emphasizing the importance of early detection, the doctor will take proactive steps to address the patient's breast health concerns and provide timely interventions if needed.

Simulation 9

Patient: "I've been struggling with my weight and have been unable to lose any pounds."

Doctor thinks: This patient may benefit from a comprehensive weight management plan that includes dietary changes, regular exercise, and medication.

Doctor: "Let's discuss your weight loss goals and develop a personalized plan focusing on healthy eating habits, physical activity, and possible medication options."

Patient's thought: I hope the doctor can provide me with the support and guidance I need to lose weight successfully and improve my health.

Discussion: The doctor's approach to addressing the patient's weight concerns through a personalized weight management plan emphasizes a holistic approach to achieving sustainable weight loss and promoting overall well-being.

Simulation 10

Patient: "I've been having constant stomach pain and digestive issues that are affecting my daily life."

Doctor thinks: This patient may be experiencing gastrointestinal issues that require further evaluation and diagnostic testing.

Doctor: "Let's discuss your digestive symptoms in more detail and potentially schedule a gastrointestinal evaluation to determine the cause of your stomach pain. I may also recommend dietary adjustments to help alleviate your symptoms."
Patient's thought: I hope the doctor can help me identify the cause of my stomach pain and provide effective treatment options.
Discussion: By proposing a gastrointestinal evaluation and dietary modifications to address the patient's digestive issues, the doctor will take proactive steps to investigate the root cause of the symptoms and develop a personalized treatment plan for optimal management.

Simulation 11

Patient: "I have been experiencing chronic fatigue, joint pain, and digestive issues for the past few months. I'm not sure what's causing it."
Doctor thinks: This patient's symptoms are complex and could indicate various underlying health issues.
Doctor: "I recommend running a series of blood tests to check for potential autoimmune disorders, thyroid dysfunction, and gastrointestinal issues."
Patient's thought: I hope these tests will provide some answers and help alleviate my symptoms.
Discussion: In this case, the doctor faces a challenging set of symptoms that require a thorough investigation. By ordering specific tests, the doctor is taking a step toward diagnosing and treating the root cause of the patient's health concerns.

Simulation 12

Patient: "I have tried multiple medications for my anxiety and depression, but nothing seems to be working. I'm feeling hopeless."
Doctor thinks: This patient may have treatment-resistant mental health conditions that require a more personalized approach.
Doctor: "Have you considered trying cognitive behavioral therapy or other therapy besides medication? It may be helpful to address the underlying issues contributing to your symptoms."
Patient thinks: I am willing to try anything at this point to feel better and improve my mental health.
Discussion: Dealing with treatment-resistant mental health conditions can be challenging for both the patient and the doctor. By suggesting therapy as an additional treatment option, the doctor is seeking to provide holistic care that addresses the patient's mental health from multiple angles.

Simulation 13

Patient: "I have been experiencing persistent chest pain and shortness of breath. I'm worried it could be a heart problem."
Doctor thinks: These symptoms could indicate a serious cardiovascular issue that requires immediate attention.
Doctor: "I recommend scheduling a cardiac stress test and an echocardiogram to assess your heart function and rule out any potential heart conditions."
Patient thinks: I'm scared that it could be serious, but I trust the doctor will help me find out.
Discussion: When a patient presents with symptoms of a heart condition, the doctor must act promptly and order appropriate tests to ensure a timely diagnosis and treatment. The patient's trust in the doctor's expertise is essential in this situation.

Simulation 14

Patient: "I have been having difficulty sleeping for the past few weeks and constantly feeling tired. I've tried over-the-counter sleep aids, but they haven't helped."
Doctor thinks: This patient may be experiencing insomnia due to underlying stress, anxiety, or other factors that require further evaluation.
Doctor: "Let's explore potential underlying causes of your sleep issues, such as stress, lifestyle factors, or medical conditions. I may recommend a sleep study to understand your sleep patterns better."
Patient thinks: I want to find a solution to my sleep problems and start feeling rested again.
Discussion: Chronic sleep issues can significantly impact a person's overall well-being, so the doctor needs to assess the root cause and offer appropriate interventions. By suggesting a sleep study and investigating potential contributing factors, the doctor proactively manages the patient's sleep problems.

Simulation 15

Patient: "I have been experiencing severe abdominal pain, bloating, and changes in my bowel habits. I'm concerned it could be something serious like colorectal cancer."
Doctor thinks: These symptoms are concerning and require further investigation to rule out more severe conditions.
Doctor: "Given your symptoms, I recommend scheduling a colonoscopy to evaluate the health of your colon and investigate potential causes of your digestive issues."
Patient thinks: I'm scared of what the colonoscopy might reveal, but I know it's essential to get to the bottom of my symptoms.
Discussion: When a patient presents with worrisome gastrointestinal symptoms, the doctor should recommend appropriate screening tests to detect potential health issues early. The patient's anxiety about the procedure is understandable, but the doctor's recommendation is aimed at providing a definitive diagnosis and guiding treatment decisions.

Simulation 16

Patient: “I have a family history of diabetes, and I’m concerned about my risk of developing the condition. I would like to know if there are any preventive measures I can take.”

Doctor thinks: The doctor is impressed by the patient’s proactive approach to managing their health and considers addressing their concerns and assessing their risk factors essential.

Doctor: “Given your family history, I recommend monitoring your blood sugar levels regularly, maintaining a healthy diet, and staying physically active to reduce your risk of developing diabetes. We can also consider genetic testing to assess your susceptibility to the condition.”

Patient thinks: I want to take control of my health and do everything I can to prevent diabetes from developing.

Discussion: A family history of diabetes can increase an individual’s risk of developing the condition, so the doctor must provide personalized recommendations for preventive measures. By promoting lifestyle modifications and discussing genetic testing options, the doctor empowers the patient to manage their health and mitigate their risk of diabetes proactively.

Simulation 17

Patient: “I have been experiencing frequent headaches, dizziness, and blurred vision. I’m worried it could be a neurological issue.”

Doctor thinks: These symptoms may indicate a neurological disorder or other underlying health condition that requires further evaluation.

Doctor: “I recommend scheduling a neurological exam and possibly a brain imaging study to assess the health of your brain and investigate potential causes of your symptoms.”

Patient thinks: I’m anxious about what the tests might reveal, but I know it’s essential to get to the bottom of my health concerns.

Discussion: When a patient presents with symptoms that could be related to a neurological issue, the doctor must order appropriate tests to assess brain health and identify any potential abnormalities. The patient’s anxiety about the tests is normal, but the doctor’s recommendation is aimed at providing a definitive diagnosis and guiding treatment decisions.

Simulation 18

Patient: “I have been experiencing unexplained weight loss, fatigue, and persistent coughing. I’m concerned it could be something serious like cancer.”

Doctor thinks: These symptoms could indicate a serious underlying health condition that requires prompt evaluation and diagnosis.

Doctor: “Given your symptoms, I recommend scheduling a series of tests, including blood work, imaging studies, and possibly a biopsy, to investigate potential causes of your weight loss and other concerns.”

Patient thinks: I’m scared of what the tests might reveal, but I know it’s essential to get a clear understanding of my health issues.

Discussion: When a patient presents with concerning symptoms, such as unexplained weight loss and persistent coughing, the doctor must order a comprehensive set of tests to identify any potentially serious conditions. The patient’s fear of a cancer diagnosis is understandable, but the doctor’s proactive approach to investigating the symptoms is essential for timely intervention and appropriate treatment.

Simulation 19

Patient: “I have been struggling with chronic pain in my lower back for years, and it’s affecting my daily life. I’ve tried various treatments, but nothing seems to provide long-lasting relief.”

Doctor thinks: This patient’s chronic pain requires a comprehensive evaluation to determine the underlying cause and develop an effective treatment plan.

Doctor: “Let’s conduct a thorough assessment of your lower back pain, including a physical examination, imaging studies, and possibly a consultation with a pain specialist to explore advanced treatment options, such as nerve blocks or physical therapy.”

Patient thinks: I hope the doctor can help me find a solution to my chronic pain and improve my quality of life.

Discussion: Chronic pain management can be complex and challenging, requiring a multidisciplinary approach to address the underlying causes and improve the patient’s quality of life. By recommending a comprehensive evaluation and potential advanced treatment options, the doctor proactively addresses the patient’s long-standing pain issues and enhances their overall well-being.

Simulation 20

Patient: “I have been experiencing severe mood swings, irritability, and difficulty concentrating. I’m concerned it could be a sign of a mental health disorder.”

Doctor thinks: These symptoms may be indicative of a mood disorder or other mental health condition that requires proper diagnosis and treatment.

Doctor: “Let’s discuss your symptoms in more detail and consider conducting a mental health assessment to evaluate your mood, cognitive function, and overall emotional well-being. We may also explore therapy options or medication management to address your concerns.”

Patient thinks: I’m scared of what the assessment might reveal, but I know it’s important to address my mental health issues.

Discussion: When a patient presents with symptoms suggestive of a mental health disorder, the doctor must conduct a thorough assessment and offer appropriate treatment interventions. The patient’s fear of a potential diagnosis is understandable, but the doctor’s proactive approach to addressing mental health concerns is aimed at providing support, guidance, and effective management strategies.

Using AI to Pose Questions and then Immediately Answer These Questions

Artificial intelligence in the medical field has altered how medical staff communicate with patients. In assisting patients through their health journeys, AI acts as a didactic coach by asking questions and offering answers. This technology makes personalized and efficient care possible, leading to better health results. Several crucial considerations arise regarding the application of AI in medicine. First, to provide correct

diagnoses, how might AI assist medical personnel in gathering pertinent patient information? Second, how can AI help patients clearly and concisely understand their diseases and the therapy alternatives available to them? Lastly, how can AI be utilized to track patients' progress and provide feedback to both patients and healthcare providers? Table 3 presents a sampling of 14 questions and answers that illustrate this process. AI can be used iteratively to generate many such questions and answers, with the content tailored to specific issues when necessary.

Table 3: Fourteen questions generated by AI regarding the relationship between patients and healthcare professionals, and the immediate answer to each question provided by AI.

The prompt was given to AI to create fifteen questions and answers.

Create 15 questions and immediately answer each question. The topic is how AI affects the relationships between patients and healthcare professionals. Provide an answer with at least three sentences.

The 15 questions and answers generated by AI

1. How can AI enhance our understanding of the emotional dynamics between patients and healthcare professionals? AI can process vast amounts of data and identify patterns that may not be immediately apparent to human researchers. AI could uncover subtle cues and nuances that reveal underlying emotions and attitudes by analyzing interactions between patients and doctors. This could lead to a deeper understanding of the complex dynamics in the healthcare setting, thereby helping to improve communication and foster more positive relationships between patients and healthcare professionals.

2. How can AI enhance patient-doctor communication and relationships in the medical field? AI can help improve patient-doctor communication and relationships by providing insights into the linguistic and emotional cues that may influence interactions. For example, AI-powered chatbots can enhance communication by providing real-time feedback on language choices, tone, and empathy. AI can also analyze communication patterns to identify areas where misunderstandings may occur or where improvements can be made. Utilizing AI tools allows healthcare providers to refine communication skills and foster stronger patient relationships.

3. How might AI challenge traditional notions of trust and empathy in the patient-doctor relationship? AI's reliance on data and algorithms raises questions about how trust and empathy are established and maintained in the patient-doctor relationship. While AI may provide valuable insights and recommendations, some patients hesitate to trust a machine with their personal information and emotions. This could disrupt the traditional dynamics of trust and empathy, which are crucial for effective healthcare delivery. It also raises questions about the role of human intuition and judgment in medical decision-making.

4. What are the potential benefits of using AI in research on patient-doctor relationships and healthcare experiences? The potential benefits of using AI in research on patient-doctor relationships and healthcare experiences include improved communication, enhanced decision-making, and personalized care. AI tools can analyze vast amounts of data to identify trends and patterns in patient interactions, leading to more effective communication and relationship-building between patients and healthcare providers. AI can also support clinical decision-making by providing insights into treatment options, predictive analytics, and patient outcomes. Additionally, AI technologies can help tailor healthcare services to individual patient needs, preferences, and circumstances, ultimately improving the quality and efficiency of care delivery.

5. How can AI be used to analyze patient data and identify patterns in healthcare experiences? Using AI, researchers can analyze large datasets of patient information to identify trends, correlations, and patterns in healthcare experiences. AI can sift through vast amounts of data much more efficiently than humans, allowing for the detection of subtle relationships between variables that may influence patient outcomes. Using machine learning algorithms, AI can uncover insights that may have been overlooked using traditional research methods.

6. What insights can AI provide into the perspectives and attitudes of patients and healthcare professionals in healthcare settings? AI can provide insights into the perspectives and attitudes of patients and healthcare professionals in healthcare settings by analyzing textual data, including patient reviews, social media posts, and medical records. Using natural language processing techniques, AI can identify common themes, sentiments, and opinions that patients and doctors express. These insights can help researchers understand the factors influencing patient satisfaction, doctor-patient relationships, and overall healthcare experiences. AI can also uncover disparities in perspectives between different demographic groups, shedding light on areas for improvement in healthcare delivery.

7. Have you ever considered the ethical implications of using AI as a collaborative tool in medical research, particularly in patient-doctor relationships? The moral implications of using AI in medical research are vast and complex. While AI can provide valuable insights into patient-doctor interactions, concerns exist about the potential impact of relying solely on AI for understanding human emotions and experiences. It raises questions about the role of empathy and understanding in healthcare and the potential for

dehumanization in medical care. There are also questions about the responsibility of researchers and healthcare providers in utilizing AI to analyze sensitive data and make decisions that may impact patient outcomes.

8. How can AI be utilized to promote patient-centered care and enhance the overall healthcare experience? AI can personalize healthcare services and tailor treatment plans to meet patients' needs. AI could help doctors better understand patient preferences and concerns by analyzing patient feedback and behavior, leading to more patient-centered care. This could improve communication, increase patient satisfaction, and improve health outcomes. However, ethical considerations include ensuring patient privacy and autonomy are respected when using AI technologies.

9. Does AI have the capacity to understand and interpret human emotions in patient-doctor relationships accurately? The ability of AI to interpret human emotions accurately is a topic of debate among researchers and healthcare professionals. While AI has demonstrated impressive natural language processing and sentiment analysis capabilities, its understanding of complex human emotions remains limited. Nonverbal cues, cultural differences, and individual variability can affect the accuracy of an AI's emotional analysis. Considering these limitations when utilizing AI to examine patient-doctor relationships is crucial.

10. How can AI address communication barriers between patients and doctors from diverse backgrounds? AI can bridge communication gaps between patients and doctors from different cultural or linguistic backgrounds. By providing real-time translation services and cultural sensitivity training, AI can help improve cross-cultural communication and enhance the patient experience. This could improve health outcomes for patients from diverse backgrounds and promote inclusiveness in the healthcare system. However, there are challenges to consider, such as ensuring the accuracy and reliability of AI language translation tools.

11. What are the implications of using AI to analyze patient feedback and satisfaction surveys in the context of the patient-doctor relationship? Utilizing AI to analyze patient feedback and satisfaction surveys can provide valuable insights into the factors influencing patients' perceptions of their healthcare experiences. By identifying patterns and trends in patient responses, AI could help doctors better understand areas for improvement and tailor their communication strategies accordingly. However, concerns exist about the potential for bias in AI algorithms and the accuracy of interpreting qualitative data. It is essential to approach this use of AI with caution and transparency to ensure the integrity of the patient feedback analysis.

12. How might the introduction of AI in healthcare settings impact the power dynamics between patients and healthcare providers? The introduction of AI in healthcare settings can shift power dynamics by giving patients access to more information and decision-making support. AI could empower patients to take a more active role in their healthcare decisions, potentially challenging the traditional authority of doctors. This could lead to a more collaborative approach to care, where patients and healthcare professionals collaborate in decision-making. However, there are concerns about the potential for AI to reinforce existing disparities in healthcare access and quality of care.

13. What are the implications of using AI to analyze patient narratives and personal stories in the context of the patient-doctor relationship? Utilizing AI to analyze patient narratives and personal stories can reveal valuable insights into patients' emotional experiences within the healthcare system. By identifying common themes and emotions in patient stories, AI could help doctors better understand the lived experiences of their patients and tailor their care accordingly. This could lead to more empathetic and patient-centered healthcare practices. However, there are ethical considerations to consider, such as ensuring patient privacy and confidentiality are protected when analyzing sensitive personal data.

14. How can AI be utilized to enhance the emotional intelligence of healthcare providers during their interactions with patients? AI can augment the emotional intelligence of healthcare providers by providing real-time feedback and insights into patient emotions and needs. AI could help doctors better understand patient emotions and enhance empathy and communication skills by analyzing patient responses and behaviors. This could lead to more effective patient-doctor relationships and improved patient outcomes. It is essential to approach AI in this context with empathy and mindfulness, ensuring that AI tools support and enhance human compassion rather than replace it.

What's Next in the Century to Come?

The final exploration focuses on the next century, 2025-2135, and specifically on what may come. An examination of the results of this long-range exercise reveals that it yields mainly questions rather than predictions. This may be because AI-driven forecasts often generate more questions than answers, as humans are complex and unpredictable. The complex human emotions, behaviors, and social influences that significantly impact the doctor-patient dynamic are outside the scope of AI's ability to analyze patterns and data for reliable predictions. Thus, the AI-generated queries might not provide apparent solutions but might spark more discussion and research.

The ever-changing landscape of technology, healthcare regulations, and social conventions makes it challenging to generate accurate predictions regarding the relationship between

healthcare providers and patients. Ethical concerns arising from new technologies may also shape how patients and healthcare providers interact. Changes in healthcare delivery systems, such as telemedicine and tailored medication, may also introduce new aspects that affect the doctor-patient dynamic. These uncertainties contribute to a proliferation of questions rather than definitive statements. Furthermore, individuals' preferences, cultural backgrounds, and health concerns shape their interactions with their healthcare providers. Despite its ability to process vast amounts of data, AI may struggle to fully grasp the intricacies of these human connections. Questions about the future of the doctor-patient relationship brought up by AI-generated forecasts reflect the ongoing need for dialogue, research, and collaboration to navigate the complex terrain of healthcare delivery in the 21st century and beyond (see Table 4).

Table 4: The “looking backward” approach applied to the next one hundred years, 2025-2125. The request for AI focuses on using AI to improve healthcare professionals’ relationship with patients.

The prompt is provided to the Idea Coach feature of the BimiLeap.com platform.

The year is 2035. We are in a meeting attended by physicians, medical researchers, AI experts, engineers, hospital administrators, social media experts, and insurance companies dealing with medical issues. We also have ethicists.

The focus is predicting what AI will do in the coming century, between 2025 and 2125. The group is very conversant in the foundations and applications of AI in medicine.

You are a fly on the wall. You hear everything and know what people think when they say things. In a set of 15 extensive paragraphs, present verbatim what the people of this meeting are thinking regarding the use of AI in the medical world, which is expected between 2025 and 2125. Be clear, quote verbatim statements, and present the results in detail for the future. Ensure you identify each speaker, job, history, statement, reason for making the statement, and implications.

AI returns with the following:

1. Speaker: Dr. A, a medical researcher specializing in genetics. Statement: “I am concerned about the ethical implications of using AI in medicine. We must ensure that patient data is protected and that algorithms are not biased against certain groups.” Reason: Dr. A is mindful of the potential risks associated with AI in healthcare, such as data privacy and algorithmic bias.
2. Speaker: Dr. B, an AI expert. Statement: “I think the key to successful implementation of AI in medicine is collaboration between medical professionals and technologists. We need to work together to develop user-friendly and clinically relevant tools.” Reason: Dr. B recognizes the importance of interdisciplinary collaboration in harnessing the full potential of AI in healthcare.
3. Speaker: Mr. C, an engineer specializing in robotics. Statement: “I see great potential in using AI-powered robots for surgical procedures. They can enhance precision and minimize human error, improving surgical outcomes.” Reason: Mr. C sees the integration of AI and improvement in the quality of surgical care.
4. Speaker: Ms. D, a hospital administrator. Statement: “I am interested in exploring how AI can optimize resource allocation and streamline administrative processes in healthcare settings. This could lead to cost savings and improved efficiency.” Reason: Ms. D is focused on the operational aspects of implementing AI in healthcare, such as staffing and resource management.
5. Speaker: Ms. E, a social media expert. Statement: “I think leveraging social media data with AI algorithms can help us better understand population health trends and tailor public health interventions accordingly.” Reason: Ms. E sees the value of using AI to analyze social media data for public health surveillance and intervention strategies.
6. Speaker: Dr. F, a physician with a background in AI research. Statement: “I am concerned about the potential job displacement of healthcare professionals due to the automation of tasks by AI. We need to consider the implications for the workforce and ensure that proper training and support are provided.” Reason: Dr. F is mindful of the potential impact of AI on healthcare jobs and calls for measures to mitigate workforce disruption.
7. Speaker: Dr. G, a medical researcher specializing in genetics. Statement: “I worry that relying too heavily on AI for medical decision-making may dehumanize healthcare. We must balance technology and human empathy in patient care.” Reason: Dr. G emphasizes the importance of maintaining the human touch in healthcare even as AI becomes more prevalent in clinical practice.
8. Speaker: Mr. H., an AI expert. Statement: “I believe that AI has the potential to democratize healthcare by improving access and affordability. AI-powered virtual care platforms can bring medical expertise to underserved populations.” Reason: Mr. H. sees AI as a tool to address healthcare disparities and improve access to quality care for all individuals.
9. Speaker: Mr. I., an engineer specializing in robotics. Statement: “I am excited about developing AI-powered medical devices that can monitor patient health in real-time and intervene when necessary. This could revolutionize chronic disease management and preventive care.” Reason: Mr. I. sees AI-driven medical devices as a gamechanger in managing chronic conditions and promoting preventive healthcare.
10. Speaker: Mr. K., a hospital administrator. Statement: “AI is a way to optimize patient flow and reduce wait times in healthcare facilities. By predicting patient demand and optimizing schedules, we can improve the overall patient experience.” Reason: Mr. K. is focused on using AI to enhance healthcare facilities’ operational efficiency and patient satisfaction.
11. Speaker: Ms. L., a social media expert. Statement: “AI can help combat misinformation and promote health literacy by analyzing and debunking false claims online. This could empower individuals to make informed healthcare decisions.” Reason: Ms. L. sees AI as a tool to address the spread of misinformation on social media platforms and promote evidence-based health information.
12. Speaker: Dr. M., a physician with a background in AI research. Statement: “I am interested in exploring the potential of AI in drug discovery and personalized medicine. We can develop targeted therapies for various diseases by analyzing vast amounts of genomic data.” Reason: Dr. M. sees AI as a powerful tool for accelerating the pace of drug discovery and advancing precision medicine approaches.
13. Speaker: Dr. O, a medical researcher specializing in genetics. Statement: “AI can play a significant role in early disease detection and prevention. By analyzing biomarkers and risk factors, we can identify at-risk individuals and intervene before diseases progress.” Reason: Dr. O. recognizes the potential of AI in shifting healthcare toward a more preventive and proactive model focused on early detection and intervention.

14. Speaker: Mr. P., an AI expert. Statement: "I think that the key challenge in realizing the full potential of AI in medicine is ensuring transparency and accountability. We must develop standards for AI algorithms and ensure they are ethically and clinically sound." Reason: Mr. P. highlights the importance of ethical considerations and regulatory oversight in developing and deploying AI technologies in healthcare.

Discussion and Conclusions

AI in research can potentially improve patient-doctor relationships, healthcare delivery, and social understanding; nevertheless, ethical considerations must be considered, such as the preservation of data, informed consent, and algorithm bias. Using AI, it is possible to analyze the patterns of language, emotions, and behavior expressed during interactions between patients and medical professionals, which can potentially enhance communication and strengthen relationships. In addition, AI can recognize disparities in healthcare access and outcomes. As a result, it can advocate for programs such as health equality and removing inequalities.

AI also has the potential to investigate patient perceptions, barriers to access, cultural competency, and affordability measures to make healthcare more accessible to broader populations. In addition, it might assist medical professionals in comprehending patients' viewpoints about telemedicine, digital health applications, and remote monitoring. AI can also facilitate the distribution of resources, the establishment of cultural competency, and the maximization of patient education for managing chronic diseases. To increase trust and improve outcomes, care planning can be tailored to each patient's specific needs.

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