

Case Report

Open Access

Dealing at the Early Stages with the Negative Medical News about Cancer: Using AI and Mind Genomics as Counselors

Howard R Moskowitz^{1,2*}, Sharon Wingert², Sunaina Saharan³ and Stephen D Rappaport⁴¹Mind Genomics Associates, Inc., White Plains, New York, USA²Tactical Data Group, Stafford, Virginia, USA³Government Medical College and Hospital, Patiala, Punjab, India⁴Stephen D. Rappaport Consulting LLC, Norwalk, Connecticut, USA**ABSTRACT**

The paper introduces a collaboration between generative AI and the researcher to understand how a medical professional can understand the thinking of a person newly diagnosed with a serious cancer. The approach uses ChatGPT 3.5 in a four-phase approach that can be done from start to finish at low cost, and in a repetitive fashion (iterations at each phase). In less than 12 hours, using the Mind Genomics platform, BimiLeap.com returns with insights and recommendations. The approach is set up so that each phase can be run repeatedly to build up a bank of deep knowledge. Each repeat effort for a phase is called an "iteration," requiring 15-20 seconds of computer time. Phase 1 simulates a patient support group for patients with newly diagnosed cancers. Phase 2 simulates a series of AI-generated questions and answers regarding information that the patient would like to share with their personal physician, their closest friend, and a trusted cleric. Phase 3 shows a series of informative questions and answers which can educate the patient. Phase 4 shows a series of innovations recommended by AI, after AI has "digested" all the information it has provided to the user. Phases 1-3 are provided immediately after being created in an iteration. The innovations presented in Phase 4 are part of an extensive iteration-by-iteration analysis and expansion of the insights generated by AI for the specific iteration.

***Corresponding author**

Howard R Moskowitz, Mind Genomics Associates, Inc., White Plains, New York, USA.

Received: February 07, 2025; **Accepted:** February 11, 2025; **Published:** February 20, 2025

Keywords: Cancer Diagnosis Support, Doctor-Patient Communication, Emotional Support in Oncology, Generative Ai, Mind Genomics, Patient-Centered Care

Abbreviations**AI:** Artificial Intelligence**ChatGPT:** Chat Generative Pre-Trained Transformer**Introduction**

Conveying a serious or potentially life-altering diagnosis to a patient can pose various difficulties for healthcare providers. One of the challenging aspects is the emotional burden of delivering devastating news to a patient and their loved ones, often an obstacle when the medical professionals may have developed a deep connection with their patient [1]. Further lies the requirement to provide accurate information and to respond appropriately and professionally to questions the patient may have yet maintain a sense of compassion and empathy [2].

The mind of a patient in the early stages of a serious illness can be complex, evolving at its own timeframe. Individuals experience a range of emotions when reflecting on their previous life, including a sense of loss or grief, as well as feelings of anger or frustration towards what they perceive as an unfair circumstance. Some feel anxious and uncertain about their future. Others simply struggle

to come to terms with their diagnosis. Some also experience a profound sense of isolation and loneliness as they journey through their illness and recognize what has happened to their daily lives. Some are panicked by the expected difficulties to be encountered while dealing with the unknowns surrounding their medical outlook and the changes they may need to make to their daily routines and personal connections [3,4].

When it comes to mind-set, medical professionals must carefully balance the delicate task of delivering a realistic prognosis while also nurturing hope in their patients. Finding the right balance between being honest about the seriousness of a patient's condition and offering unwavering support during their treatment can be difficult. Medical professionals may encounter challenges when it comes to managing their own emotions of helplessness or guilt, perhaps in some way blaming themselves for one or another aspect of the patient's illness [5-7].

With this introduction, can the patient and the medical professional find new directions using the power of generative AI (e.g., ChatGPT), along with the emerging science of Mind Genomics, dealing with the world of the everyday [8,9]. It is to this issue that the paper is directed. The paper is divided into four phases, each powered by generative AI:

- Simulation of a support group for cancer diagnosis

- Questions that a patient might ask, answered by a friend, a clergy person, and the doctor
- Questions and answers created by AI
- Innovations suggested by AI for each “iteration” or interaction with AI.

Simulation of a Cancer Diagnosis Support

Cancer diagnosis can be overwhelming, and support groups provide emotional support [10-12]. In the digital age, artificial intelligence (AI) can enhance the support group experience by simulating a cancer diagnosis support group. This allows patients to access resources 24/7, providing immediate guidance during crises. AI can also provide personalized recommendations based on individual needs, ensuring tailored support. It also offers anonymity and privacy, reducing barriers to seeking support. AI simulations can facilitate connections between patients from diverse backgrounds, fostering a supportive community. Additionally, AI can guide discussions, provide prompts, and offer educational resources to enhance the group experience.

The power of AI emerges in Table 1. The top of Table 1 shows the prompts given to the AI link (Idea Coach) embedded in the Mind Genomics platform, BimiLeap.com. The bottom of Table 1 shows two support groups simulated by Idea Coach, each requiring 15-20 seconds to simulate and return with the results.

Table 1: Ai Simulation of Two Support Groups for Early-Stage Cancer Diagnosis

Instructions (PROMPTS) Given to AI (IDEA COACH, CHATGPT 3.5)

We are sitting in a support group session with patients in a well-known hospital who are in the early stages of dealing with the diagnosis of a potentially fatal cancer that has been discovered in the past month. The hospital maintains a patient support group, led by psychologists and psychiatrists familiar with cancer and its effects on the mind of the patient and the family.

Reproduce a conversation in this support group and provide a clear description and integration of the feeling of each person as she or he says their words. In the description of the words of each person please try to provide an interpretation of WHY the person is saying those particular words, and what should the listener be focusing on about this patient.

Two Iterations Simulating Support Groups for Early-Stage Cancer Diagnosis

Support Group -1

Patient 1: “I can’t stop thinking about all the things I won’t be able to do if this cancer takes over.”

Feeling: Anxiety and fear. The patient is likely worried about the impact the cancer will have on their life and future plans.

Focus: The listener should focus on providing reassurance and guidance on coping with uncertainty and adjusting expectations.

Patient 2: “I feel guilty for burdening my loved ones with my illness.”

Feeling: Guilt and self-blame. The patient may be struggling with feelings of inadequacy and worry about the impact on their relationships.

Focus: The listener should focus on validating the patient’s emotions and helping them work through these feelings of guilt.

Patient 3: “I just want to know how much time I have left so I can plan accordingly.”

Feeling: Desperation and a need for control. The patient may be struggling with uncertainty and seeking some sense of predictability.

Focus: The listener should focus on providing support and discussing coping strategies for dealing with uncertainty.

Patient 4: “I don’t want to burden my family with my illness, so I’ve been keeping my emotions to myself.”

Feeling: Isolation and loneliness. The patient may be trying to protect their loved ones by not expressing their emotions but may be feeling overwhelmed by the lack of emotional support.

Focus: The listener should focus on helping the patient open up and express their emotions in a safe and supportive environment.

Patient 5: “I feel like I’ve lost control over my own body.”

Feeling: Helplessness and frustration. The patient may be struggling with the physical changes and limitations brought on by the cancer diagnosis.

Focus: The listener should focus on discussing ways to regain a sense of control through self-care and mindfulness practices.

Patient 6: “I’m afraid of the unknown and what the future holds for me.”

Feeling: Fear and anxiety. The patient may be overwhelmed by the uncertainty of their prognosis and the impact on their life.

Focus: The listener should focus on providing reassurance and discussing coping strategies for managing fear and anxiety.

Patient 7: “I feel angry that this is happening to me, it’s not fair.”

Feeling: Anger and resentment. The patient may be struggling with feelings of injustice and frustration about their diagnosis.

Focus: The listener should focus on validating the patient’s emotions and discussing healthy ways to cope with anger.

Patient 8: “I’m finding it hard to stay positive and hopeful when faced with such a grim prognosis.”

Feeling: Hopelessness and despair. The patient may be struggling to maintain a positive outlook in the face of a potentially terminal illness.

Focus: The listener should focus on providing support and discussing ways to find hope and meaning in the midst of difficult circumstances.

Patient 9: “I’m worried about how my illness will impact my family and their future.”

Feeling: Concern and guilt. The patient may be preoccupied with the welfare of their loved ones and the impact of their illness on their family dynamics.

Focus: The listener should focus on discussing ways to communicate with and support family members, as well as addressing the patient’s own emotional needs.

Patient 10: “I feel overwhelmed by all the decisions I have to make regarding my treatment plan.”

Feeling: Confusion and uncertainty. The patient may be struggling with the complexity of treatment options and the impact on their quality of life.

Focus: The listener should focus on providing guidance and support in navigating treatment decisions, as well as discussing ways to cope with decision-making stress.

Support Group -2

Patient 1: (tearfully) “I just can’t shake this feeling of fear and hopelessness. I don’t know how I’m going to be able to fight this.”

Feeling: Overwhelmed, scared

Interpretation: The patient is expressing her deep emotions of fear and despair, showing vulnerability in facing the unknown of her diagnosis. The listener should focus on her need for emotional support and reassurance.

Patient 2: (angrily) “Why me? I’ve always taken care of myself, I never smoke or drink. This is so unfair!”

Feeling: Anger, frustration

Interpretation: This patient is experiencing a sense of injustice and frustration at being diagnosed with cancer despite leading a healthy lifestyle. The listener should be attentive to her need to process and express these intense emotions.

Patient 3: (sadly) "I don't want to burden my family with this. I feel like I should just keep it all inside."

Feeling: Guilt, sadness

Interpretation: This patient is struggling with feelings of guilt and a sense of burden on her loved ones. The listener should focus on helping her understand the importance of seeking support and sharing her feelings with others.

Patient 4: (calmly) "I'm trying to stay positive and focus on the present moment. It's the only way I can get through this."

Feeling: Determination, acceptance

Interpretation: This patient is showing resilience and acceptance in the face of her diagnosis, choosing to focus on the present moment and maintain a positive outlook. The listener should acknowledge her strength and offer encouragement and support.

Patient 5: (quietly) "I'm so scared of what the future holds. I can't stop thinking about all the what ifs."

Feeling: Anxiety, uncertainty

Interpretation: This patient is struggling with anxiety and uncertainty about the future, feeling overwhelmed by the unknown. The listener should focus on providing reassurance, mindfulness techniques, and coping strategies for managing her fears.

Patient 6: (optimistically) "I know this is going to be a tough journey, but I believe in the power of positivity and hope. I'm not giving up."

Feeling: Optimism, determination

Interpretation: This patient is displaying a resilient and hopeful attitude, choosing to focus on positivity and determination in her fight against cancer. The listener should acknowledge her strength and offer support in maintaining this positive mind-set.

Patient Questions, Answers from Doctor, Friend, and Clergy, Respectively

The objective of Phase 2 is to simulate patient inquiries and have the doctor, best friend, and cleric, respectively, answer each inquiry.

Patient Benefit

The answers' many viewpoints make the patient feel understood and supported. Hearing how their doctor, friend, and cleric respond to the same issue gives the patient a well-rounded view of their situation. The exercise helps patients understand their sentiments and needs by reflecting on their beliefs and feelings.

Benefit for the Medical Professional

Understanding the patient's relationships and support systems helps doctors personalize care to their patient's needs. The exercise helps the doctor understand the patient's worries and beliefs beyond their physical problems, possibly directing the effort towards a more tailored treatment. The exercise increases empathy and understanding, enabling the medical professional to connect with patients and possibly design a more holistic treatment [13,14].

Benefit for Medicine

This activity can improve patient-physician communication, improving outcomes and patient satisfaction. A holistic approach to patient care helps doctors address patients' mental, emotional, and spiritual needs—fostering wellness. The exercise can help healthcare become more patient-centered by shifting from treating symptoms to understanding and supporting the full person [15].

Table 2 shows the prompt given to Idea Coach. It also shows the generated patient inquiries and the responses given by the doctor, best friend, and cleric.

Table 2: Questions Asked by Patients, and Answered by Doctors, Friends, and Clerics

Instructions (PROMPTS) Given to AI (IDEA COACH, CHATGPT 3.5)

I am focusing on the challenge of a patient who knows that they have a serious illness. The patient has a great deal of medical knowledge, and so the patient "knows" the seriousness of the diagnosis.

The problem is still in its earliest stage. How does the patient talk to themselves, and give themselves strength in the midst of knowing the seriousness of the problem, but also realizing that the worst is yet to be?

Please write a meaningful set of questions asked by the patient, for each question the answer given by each of three people: the patient's personal physician, the patient's closest personal friend, and the patient's trusted clergy person.

Each person's answer to a question has four parts:

- What each of the three people answers
- What the patient "takes away" from these three answers and goes the next step
- Explanation of the answers
- A slogan to summarize the answers

Set 1 – Dealing with the Medical Issues

Question 1: "What Are the Best Treatment Options for My Condition?"

Personal physician: Recommends a combination of surgery, chemotherapy, and radiation therapy.

Closest friend: Encourages exploring alternative and holistic treatments.

Trusted cleric: Suggests turning to faith and prayer for healing. Patient takeaway: Combining traditional and alternative treatments may lead to the best outcome.

Explanation: Each person offers a different perspective on treatment options based on their expertise and beliefs.

Slogan: "Embrace all avenues of healing."

Question 2: "How Can I Navigate the Uncertainty of My Future and Make Decisions About My Treatment with Confidence?"

Personal physician: "Ask questions, seek second opinions, and trust your instincts when making decisions about your treatment."

Friend: "Educate yourself, seek advice from trusted sources, and listen to your intuition when making decisions about your health."

Trusted cleric: "Pray for guidance, trust in the process, and find peace in making decisions with faith."

Patient takeaway: "I need to ask questions, seek advice from trusted sources, and trust in the decisions I make with confidence."

Explanation: Each person emphasizes the importance of education, trust in instincts, and finding peace in decisions made.

Slogan: "Informed decisions, guided by trust."

Question 3: "How Can I Balance Being Informed About My Illness with Not Letting it Consume Me?"

Personal physician: "Stay informed about your diagnosis and treatment options, but limit exposure to negative information and seek reliable sources."

Friend: "Stay connected with loved ones, distract yourself with activities you enjoy, and prioritize self-care to maintain a balance."

Trusted cleric: “Trust in the journey ahead, find peace in surrendering control, and focus on the present moment rather than dwelling on the future.”

Patient takeaway: “I will stay informed but limit exposure to negative information, prioritize self-care, and focus on the present moment.”

Explanation: Each person’s answer emphasizes the importance of finding a balance between staying informed and maintaining mental and emotional well-being.

Slogan: “Knowledge is power, but balance is key.”

Set 2 - Maintain Function in Face of Illness

Question 4: “How Can I Find Peace and Acceptance in the Face of a Serious Diagnosis?”

Physician: “Seek support from mental health professionals, practice mindfulness and acceptance, and communicate your feelings with loved ones.”

Friend: “Lean on your support system, focus on the present moment, and find solace in everyday moments of joy and connection.”

Trusted cleric: “Find peace in surrendering control to a higher power, trust in the journey ahead, and seek comfort in prayer.”

Patient takeaway: “I will seek support from mental health professionals, focus on the present moment, and find peace in surrendering control.”

Explanation: Each person’s answer highlights the importance of seeking support, finding peace in the present moment, and surrendering control to a higher power.

Slogan: “Acceptance is the key to finding peace in difficult times.”

Question 5: “How Can I Stay Positive and Hopeful Despite the Seriousness of My Illness?”

Personal physician: Recommends practicing mindfulness and focusing on self-care.

Closest friend: Offers emotional support and reminds the patient of their strength.

Trusted cleric: Encourages finding comfort in spirituality and connecting with a higher power.

Patient takeaway: Finding balance between self-care, support, and spirituality can help maintain a positive mind-set.

Explanation: Each response emphasizes the importance of mental and emotional well-being during challenging times.

Slogan: “Strength in positivity.”

Question 6: “What Can I Do to Stay Motivated and Keep Fighting?”

Personal physician: Suggests setting small goals and celebrating achievements along the way.

Closest friend: Recommends engaging in activities which bring joy and distraction.

Trusted cleric: Encourages finding purpose and meaning in the journey.

Patient takeaway: Finding motivation through goals, joy, and purpose can sustain the fighting spirit.

Explanation: Each person offers a unique way to stay motivated and focused on the journey ahead.

Slogan: “Find strength in purpose.”

Question 7: “How Can I Manage the Fear of What the Future Holds?”

Personal physician: Advises seeking counseling or therapy to address fears and anxieties.

Closest friend: Suggests practicing mindfulness and living in the present moment.

Trusted cleric: Encourages finding peace and surrendering to

the unknown future.

Patient takeaway: Embracing therapy, mindfulness, and faith can help alleviate fears of the unknown future.

Explanation: Each response offers a different approach to managing fear and uncertainty.

Slogan: “Courage in uncertainty.”

Question 8: “How Can I Maintain a Sense of Purpose and Meaning in My Life Despite the Challenges I Am Facing with My Diagnosis?”

Personal physician: “Focus on your passions and interests, set small achievable goals, and find meaning in helping others going through similar challenges.”

Closest friend: “Engage in activities which bring you joy, volunteer for a cause you care about, and find purpose in the connections you make with others.”

Trusted cleric: “Pray for guidance, trust in the greater purpose, and find meaning in the lessons learned through adversity.”

Patient takeaway: “I need to focus on my passions, volunteer for a cause I care about, and find meaning in the connections I make with others.”

Explanation: Each person emphasizes the importance of finding purpose, joy, and connections in life despite challenges faced.

Slogan: “Purpose in passion, joy in connection.”

Question 9: “How Can I Balance Taking Care of Myself Physically and Emotionally During this Challenging Time?”

Personal physician: “Prioritize self-care by following your treatment plan, maintaining a healthy lifestyle, and seeking support from mental health professionals if needed.”

Closest friend: “Allow yourself to experience a range of emotions and express them openly. Seek out activities and practices which bring you joy and comfort.”

Trusted Cleric: “Nurture your mind, body, and spirit through prayer, meditation, and self-compassion. Trust that you have the strength to overcome this challenge.”

Patient takeaway: The patient understands the importance of holistic self-care, including physical health, emotional expression, and spiritual nourishment. They feel empowered to prioritize their well-being during this tough time.

Explanation: Self-care involves caring for all aspects of yourself—physical, emotional, and spiritual.

Slogan: “Nurture mind, body, and spirit for strength and healing.”

Question 10: “How Can I Overcome Feelings of Isolation and Loneliness while Dealing with My Diagnosis?”

Personal physician: “Connect with support groups, seek therapy, and maintain open communication about your feelings.”

Closest friend: “Stay connected with loved ones, express your emotions, and lean on your support system for comfort.”

Trusted cleric: “Find solace in community, share your burdens with others, and find comfort in the love of those around you.”

Patient takeaway: “I need to connect with support groups, express my emotions, and find comfort in the love of those around me.”

Explanation: Each person emphasizes the importance of connection, communication, and support during times of loneliness.

Slogan: “Strength in community, love in connection.”

Set 3 – Going Public

Question 11: “How Should I Approach Discussing My Illness with My Loved Ones?”

Personal Physician: “Be honest and open with your loved ones about your diagnosis and treatment plan. They are there to support you and help you through this.”

Closest friend: “Express your thoughts and emotions authentically to your loved ones, and allow them to be there for you in the way that they know best.”

Trusted cleric: “Lean on your faith and trust in the love and compassion of your family and friends as you navigate difficult conversations.”

Patient takeaway: Today’s patient understands the importance of open communication and vulnerability with their loved ones during this challenging time. They feel supported knowing they can rely on their faith and relationships for strength.

Explanation: Honesty and vulnerability create deeper connections and allow for mutual support.

Slogan: “Strength in vulnerability and honest communication.”

Question 12: “How can I Communicate My Needs and Wishes to My Loved Ones During this Time?”

Personal physician: Recommends open and honest conversations with family and loved ones about concerns and desires.

Closest friend: Offers to facilitate conversations and provide emotional support during difficult discussions.

Trusted cleric: Encourages finding spiritual guidance in expressing needs and wishes to loved ones.

Patient takeaway: Communication is key in conveying needs and wishes to loved ones, supported by openness, emotional support, and spiritual guidance.

Explanation: Each person highlights the importance of communication and support during challenging times.

Slogan: “Speak with love.”

How Generative AI Can Teach

Phase 3 is devoted to further educating the patient by having AI raise common questions and then provide answers.

For the patient, being informed about their cancer diagnosis is crucial as it allows them to better understand their condition, treatment options, and prognosis. Knowing this information helps the patient make more informed decisions about their healthcare and empowers them to actively participate in their treatment plan. It also provides them with a sense of control over their situation and can alleviate anxiety and fear.

For the physician, having access to detailed information about a patient’s cancer diagnosis is essential for developing an individualized and effective treatment plan. This information helps the physician determine the best course of action, monitor the patient’s progress, and adjust the treatment plan as necessary. It also enables the physician to provide the patient with realistic expectations about their prognosis and potential side effects of treatment.

For the hospital, having information about a patient’s cancer diagnosis is important for ensuring coordinated and comprehensive care. This information allows the hospital to allocate resources effectively, schedule necessary appointments and procedures, and communicate effectively with the patient and their healthcare team. It also enables the hospital to track outcomes and evaluate the quality of care provided to patients with cancer [16-18].

Table 3 shows the common questions generated by AI to educate the patient regarding what generative AI can offer in their treatment journey.

Table 3: Questions and Answers Created by Ai to Educate the Patient

Instructions (PROMPTS) Provided to AI

Answer the question in the following fashion:

Repeat the question. Preface the answer by QUESTION:

Provide the solution in a paragraph, being very specific about

what to do. Explain why the solution will work. Preface the answer by SOLUTION:

Suggest two very strong slogans. Preface the answer by SLOGANS:

Suggest two very workable innovations to solve the problem and discuss how to implement those innovations. Preface the answer by INNOVATION:

Each Question and the Answer Block

Set 1 – General topics

Question 1: What Innovative Solutions can Generative AI Offer for Supporting Cancer Patients During their Treatment Journey?

Solution: Generative AI can provide innovative solutions for supporting cancer patients during their treatment journey by offering personalized care plans, real-time monitoring and support, emotional and mental health assistance, and predictive analytics for early intervention. This technology can help patients manage their symptoms, side effects, and overall well-being by generating personalized recommendations and interventions based on their individual needs and preferences. By using machine learning algorithms and predictive modeling, generative AI can anticipate potential issues and provide timely interventions to prevent complications and improve outcomes. Furthermore, generative AI can facilitate communication between patients, caregivers, and healthcare providers, enabling seamless coordination and collaboration throughout the treatment journey.

Slogans: “Empowering patients through personalized care with AI.” “Supporting patients every step of the way with generative AI.”

Innovation: Generative AI can analyze data to identify the most effective treatment options for individual cancer patients by integrating diverse data sources, using advanced analytics algorithms, and providing personalized recommendations based on the patient’s unique profile and treatment history. To implement this innovation, healthcare providers can collaborate with AI developers to build customized algorithms and predictive models for treatment optimization, validate the accuracy and reliability of these models through clinical trials and real-world applications, and ensure compliance with data privacy and security regulations to protect patient confidentiality. Additionally, continuous monitoring and feedback mechanisms can be put in place to assess the effectiveness and impact of generative AI on treatment outcomes and patient satisfaction, enabling ongoing optimization and improvement of these analytical tools.

Question 2: What Potential Challenges and Limitations May Arise When Using Generative Ai to Support Cancer Patients and Doctors?

Solution: When using generative AI to support cancer patients and doctors, potential challenges and limitations may include the risk of inaccurate or biased results due to limited training data, concerns about privacy and data security when dealing with sensitive medical information, the need for continued human oversight to prevent errors or misinterpretations by the AI, potential resistance from healthcare professionals who may feel threatened by AI technology replacing some of their tasks, the cost of implementing and maintaining AI systems, and the challenge of ensuring that AI remains up to date with the latest medical advancements and research. To address these challenges, it is crucial to prioritize data quality and diversity, establish strict data protection protocols, provide comprehensive training for healthcare professionals on AI usage, carefully monitor AI performance and outcomes, allocate sufficient resources for AI implementation, and foster collaboration

between AI developers, healthcare providers, and patients to ensure the technology meets their needs effectively.

Slogans: “Empowering cancer care with AI innovation” and “Harnessing the power of AI for better cancer outcomes.”

Innovation: One workable innovation to enhance the use of generative AI in cancer care is the development of personalized treatment recommendations based on individual patient data and preferences. This innovation could be implemented through collaboration between AI developers, oncologists, and patients to collect and analyze patient-specific information, such as genetic markers, treatment history, lifestyle factors, and treatment goals. By using this data to tailor treatment plans and recommendations, generative AI can help improve treatment outcomes, reduce side effects, and increase patient satisfaction. Another innovation could involve the integration of AI-powered telemedicine platforms to provide remote cancer care and support services to patients, especially those in underserved or remote areas. By using generative AI to facilitate virtual consultations, monitor patient progress, and deliver personalized education and guidance, healthcare providers can extend their reach, improve accessibility to care, and enhance the overall patient experience in cancer management.

Question 3: What Ethical Considerations Should Be Considered when Using Generative Ai in Cancer Care?

Solution: When using generative AI in cancer care, it is crucial to prioritize patient privacy and data protection by ensuring that all information collected and analyzed is securely stored and anonymized. Transparent communication with patients about the use of AI in their care is essential, including informing them about how their data will be used and the potential implications for their treatment. Additionally, healthcare professionals should be properly trained to interpret and validate the AI-generated recommendations, ensuring that they are in line with ethical standards and best practices in cancer care. Regular monitoring and evaluation of AI systems should be conducted to identify any biases or inaccuracies in the data and algorithms, with timely corrections made to maintain the integrity and effectiveness of the technology. By upholding ethical principles and standards in the use of generative AI in cancer care, healthcare providers can build trust with patients and optimize the benefits of this innovative technology for improving patient outcomes and experiences.

SLOGANS: “Ethical AI for compassionate cancer care.”, “Protecting your privacy, prioritizing your care.”

Question 4: How Can Generative Ai Help Reduce Language Barriers and Improve Accessibility to Cancer Care?

Solution: Generative AI can help reduce language barriers and improve accessibility to cancer care by providing real-time translation services, enabling multilingual communication between patients and healthcare providers. This technology can analyze, and process spoken or written language in different languages, translating it accurately and instantly to facilitate clear and effective communication. By offering language support for patients who do not speak the local language or have limited proficiency, generative AI can ensure that all patients receive the information and care they need, regardless of linguistic barriers. Additionally, generative AI can customize translation services based on the specific medical context and terminology related to cancer care, ensuring accurate and culturally sensitive communication for better patient understanding and engagement.

Slogans: “Breaking down language barriers with AI for better cancer care.” “Empowering patients through seamless communication with generative AI.”

Innovation: To reduce language barriers and enhance accessibility

to cancer care, generative AI can offer innovative solutions such as AI-powered language translation apps, virtual interpreter services, and multilingual patient portals. Healthcare providers can implement these solutions by integrating generative AI platforms into their communication systems, training staff on how to utilize language translation tools effectively and promoting the use of these services among diverse patient populations. Collaborating with language technology providers, AI developers, and cultural competency experts can help ensure the accuracy, reliability, and cultural appropriateness of these translation services, improving communication and understanding between doctors and patients from different linguistic backgrounds.

Set 2 – AI as an Aid to the Doctor and to the Healthcare System

Question 5: How can Generative Ai Be Integrated into Existing Healthcare Systems to Support Cancer Patients and Doctors Effectively?

Solution: Generative AI can be integrated into existing healthcare systems to support cancer patients and doctors effectively by developing interoperable software solutions which can seamlessly connect with electronic health records and patient portals. This technology can analyze patient data to provide personalized recommendations for treatment plans, follow-up care, and symptom management. By incorporating generative AI chatbots into telemedicine platforms, doctors can offer remote consultations and support to cancer patients, improving access to care. Additionally, generative AI algorithms can assist in data analysis and decision-making for oncologists, enhancing treatment planning and monitoring outcomes.

Slogans: “Revolutionizing Cancer Care with AI Integration”, “Empowering Healthcare Providers with AI Support Systems”

Innovation: Implementing generative AI technology which can automate administrative tasks, such as appointment scheduling and medication reminders, to streamline patient care processes and reduce caregiver burden. Developing an AI-powered predictive modeling system which can analyze patient data trends and alert doctors to potential treatment complications or side effects in real-time. Partnering with health insurance companies to leverage generative AI technology for identifying cost-effective treatment options and coordinating care plans for cancer patients, optimizing resource allocation and patient outcomes.

Question 6: How can Generative Ai Help Doctors Develop Personalized Treatment Plans for Cancer Patients?

Solution: Generative AI can assist doctors in developing personalized treatment plans for cancer patients by analyzing vast amounts of data from past cases, genetic information, and other relevant factors to provide tailored recommendations. This technology can also simulate potential outcomes of different treatment options, helping doctors choose the most effective course of action. By using machine learning algorithms, generative AI can continuously learn and improve its recommendations based on new data, leading to more accurate and efficient treatment plans. Furthermore, generative AI can automate aspects of the treatment planning process, allowing doctors to focus more on patient care and decision-making.

Slogans: “Empowering doctors to personalize cancer care with AI,” “Optimizing treatment plans with generative AI technology.”

INNOVATION: Generative AI can offer innovative solutions for supporting cancer patients during their treatment journey by developing personalized care plans, providing real-time monitoring and support, and offering emotional and mental health assistance. Healthcare providers can implement these solutions by integrating generative AI platforms into their existing systems, collaborating with AI developers to customize solutions for specific patient

needs, and ensuring proper training for staff on how to utilize these tools effectively. Additionally, partnering with patient advocacy groups and cancer support organizations can help raise awareness and promote the benefits of using generative AI in cancer care.

Question 7: In What Ways can Generative Ai Provide Information on Alternative Therapies and Lifestyle Changes for Cancer Patients?

Solution: Generative AI can analyze large amounts of data on alternative therapies and lifestyle changes for cancer patients, including research studies, patient testimonials, and expert recommendations. By processing this information, the AI can generate personalized recommendations for each individual patient based on their unique medical history, preferences, and goals. This personalized approach can help patients make informed decisions about their treatment plan and empower them to take control of their health. Additionally, generative AI can continuously update its recommendations as new information becomes available, ensuring that patients are always receiving the most up-to-date advice. Overall, the use of generative AI in this way can improve patient outcomes and quality of life by providing tailored support and guidance throughout their cancer journey.

Slogans: “Empowering cancer patients with AI-driven personalized guidance”, “Harnessing the power of AI for holistic cancer care.”

Set 3 – Doctor-Patient Communication

Question 8: What Benefits can Generative Ai Offer in Terms of Communication Between Doctors and Cancer Patients?

Solution: Generative AI can improve communication between doctors and cancer patients by providing accurate and easy-to-understand information about the disease, treatment options, and prognosis. This technology can generate personalized educational materials for patients, answering their questions and addressing their concerns in a timely manner. By facilitating clear and transparent communication, generative AI can help build trust between doctors and patients, leading to better cooperation and adherence to treatment plans. Furthermore, generative AI can analyze patient feedback and preferences to further tailor communication strategies, ensuring a positive and supportive experience for cancer patients.

Slogans: “Bridging the gap with AI for better cancer care.”, “Empowering patients through intelligent communication.”

Innovation: To help reduce language barriers and improve accessibility to cancer care, generative AI can offer innovative solutions such as real-time language translation services, culturally sensitive communication tools, and personalized educational content in multiple languages. Implementing these solutions involves partnering with language technology providers, integrating AI-driven translation services into healthcare platforms, and training healthcare professionals on how to effectively communicate with patients from different cultural backgrounds. Additionally, using voice recognition technology and natural language processing can enhance the accuracy and efficiency of these communication tools, making them more accessible and user-friendly for both doctors and patients.

Question 9: In What Ways can Generative Ai Assist Doctors in Delivering Difficult News to Patients with Cancer?

Solution: Generative AI can assist doctors in delivering difficult news to patients with cancer by providing scripted responses based on patient emotions, language preferences, and cultural background. This technology can also offer doctors suggestions for discussing treatment options and potential outcomes in a compassionate and clear manner. By analyzing patient data and communication, generative AI can help doctors tailor their

conversations to meet the individual needs of each patient. Additionally, generative AI can provide training modules for doctors on effective communication strategies, enhancing their ability to deliver difficult news empathetically.

Slogans: “Generative AI: Enhancing Doctor-Patient Communication in Cancer Care”, “Empower Doctors with AI Tools for Compassionate Conversations”

Innovation: Creating generative AI models which can analyze patient responses in real time during doctor consultations to provide immediate feedback on communication effectiveness. Developing virtual training simulations for doctors to practice delivering difficult news in a controlled environment, with generative AI providing personalized coaching and feedback. Partnering with medical institutions to integrate generative AI technology into existing electronic health record systems, allowing for seamless communication support during patient consultations.

Question 10: How can Generative Ai Help Patients Better Understand Their Cancer Diagnosis and Treatment Options?

Solution: Generative AI can help patients better understand their cancer diagnosis and treatment options by providing personalized explanations in easy-to-understand language. This technology can generate visual aids, such as diagrams or videos, to illustrate complex medical concepts and treatment procedures. By analyzing patient inquiries and preferences, generative AI can tailor information delivery to meet individual learning styles and needs. Additionally, generative AI can offer interactive decision-making tools which present treatment options and potential outcomes in a clear and organized manner. Overall, this approach can empower patients with knowledge and confidence in making informed decisions about their cancer care.

Slogans: “Empowering Patients with Knowledge through AI Education”, “Understanding Cancer Care with Personalized AI Guidance”

Innovation: Developing an AI-powered virtual assistant for cancer patients which can answer questions, provide resources, and guide them through their treatment journey. Implementing generative AI algorithms which can analyze patient preferences and behaviors to recommend personalized educational materials on cancer diagnosis and treatment. Partnering with oncologists and patient advocacy groups to create an AI-powered online platform for patients to access reliable information and support from cancer experts.

Question 11: How can Generative Ai Help Alleviate the Emotional Burden Associated With a Cancer Diagnosis?

Solution: Generative AI can support cancer patients emotionally by providing personalized resources, such as virtual support groups, mindfulness exercises, and coping strategies tailored to their specific needs and preferences. By using natural language processing and sentiment analysis, the AI can detect emotional distress in patients’ communications and offer appropriate interventions, such as recommending mental health resources or scheduling virtual therapy sessions. This proactive approach can help prevent feelings of isolation, anxiety, and depression often experienced by cancer patients, fostering a sense of community and support. Furthermore, generative AI can provide ongoing emotional assistance, available 24/7, to ensure that patients have access to support whenever they need it. By addressing the emotional burden associated with a cancer diagnosis, generative AI can improve patients’ mental well-being and overall quality of life throughout their treatment journey.

Slogans: “AI-driven care for your mind and heart.”, “Empathy through innovation: AI support for cancer patients.”

Question 12: How can Generative Ai Provide Personalized Support to Cancer Patients During the Early Shock of Diagnosis?

Solution: Generative AI can provide personalized support to cancer patients during the early shock of diagnosis by analyzing medical records and symptoms to create a personalized care plan. This technology can also provide information on treatment options and potential side effects in a clear and concise manner. By identifying emotional cues in patient communication, generative AI can offer empathetic responses and mood tracking to provide emotional support. This personalized approach can help patients feel more supported and informed during the difficult early stages of diagnosis.

Slogans: “Empowering Cancer Patients with Personalized AI Support”, “Navigating the Path to Healing with Generative AI Assistance”

Innovation: Integrating generative AI chatbots into cancer patient support platforms, allowing patients to ask questions and receive personalized responses in real-time. Implementing AI algorithms which analyze patient data and provide tailored emotional support resources, such as meditation exercises or support group recommendations. By partnering with healthcare providers to securely integrate generative AI technology into patient medical records, doctors can access personalized support plans and better understand patient needs.

Question 13: What Role can Generative Ai Play in Providing Emotional Support to Patients with Cancer?

Solution: Generative AI can play a crucial role in providing emotional support to patients with cancer by analyzing patient communication to identify emotional cues and provide empathic responses. This technology can offer mood tracking tools and mental health resources to help patients manage the emotional impact of their diagnosis and treatment. Generative AI chatbots can provide companionship, active listening, and encouragement to patients, alleviating feelings of isolation and anxiety. By incorporating mindfulness exercises and relaxation techniques, generative AI can help patients cope with stress and improve their overall well-being. Ultimately, generative AI can complement traditional support systems by offering personalized emotional support which is available 24/7.

Slogans: “Lending a Virtual Hand: Emotional Support with Generative AI”, “Compassionate Care: AI Solutions for Patients Facing Cancer”

Innovation: Developing generative AI models which can analyze patient sentiment in real-time during interactions with virtual support resources, adapting responses to provide appropriate emotional support. Creating a virtual support group platform powered by generative AI, where patients can connect with others facing similar challenges and receive encouragement and advice. Partnering with mental health professionals to integrate generative AI technology into therapy sessions for cancer patients, offering additional emotional support and coping strategies.

Question 14: How can Generative Ai Enhance the Patient’s Experience and Improve Outcomes for Cancer Patients?

Solution: Generative AI can enhance the patient’s experience by providing personalized treatment plans based on individual patient data and medical history. By analyzing large amounts of data, AI can offer insights into the most effective treatment options, leading to improved outcomes. AI can also streamline communication between healthcare providers and patients, ensuring timely and accurate information. Furthermore, AI can assist in monitoring patient progress and flagging potential issues before they escalate. The use of AI can lead to more efficient and effective cancer care,

benefiting both patients and healthcare providers.

Slogans: “Empowering patients with AI for better cancer care outcomes!”, “Personalized treatment plans for a brighter future with generative AI!”

Innovation: One way is by partnering with cancer research institutions and healthcare providers to gather and analyze patient data. By combining AI technology with existing medical records and research, a more comprehensive understanding of cancer treatments can be achieved. Additionally, collaborations with AI experts and data scientists can lead to the development of advanced algorithms for personalized treatment recommendations. Training healthcare professionals on how to interpret and utilize AI-generated insights can also ensure successful implementation and integration of this innovative solution.

AI as an Inventor—Ideas Created by AI After Analyzing Its Own Output from Phases 1-3

Generative AI, like Idea Coach on BimiLeap.com, can enhance user innovation by generating unique solutions to problems. The BimiLeap platform takes each iteration and stores that iteration in a separate tab in an Excel file. When the researcher has completed the iterations, the generative AI goes through the material that AI had generated in that specific iteration, generating post-iterative analyses [19-23].

Table 4 shows an example of post-iteration analysis for one of the iterations. The bottom of Table 4 shows schematically the recommended innovations emerging from the specific iteration. In turn, Table 5 shows innovations recommended from six iterations.

Table 4: Example of a Post-Iteration Analysis for One Iteration. the Analysis is Done Separately for Each Iteration.

Key Ideas

- Finding strength and leaning on support systems when facing a diagnosis.
- Managing fear of the unknown future and staying present in the moment.
- Staying hopeful, optimistic, and maintaining a positive mind-set during a serious illness.
- Coping with fears of the worst-case scenario by seeking support and staying informed.
- Balancing acceptance of a diagnosis with a desire to fight for recovery.
- Finding moments of joy and peace amidst challenging times through self-care and positive activities.

Themes

- Coping with a serious illness:
- Finding strength and leaning on support systems when facing a diagnosis.
- Managing fear of the unknown future and staying present in the moment.
- Staying hopeful, optimistic, and maintaining a positive mind-set during a serious illness.
- Coping with fears of the worst-case scenario by seeking support and staying informed.
- Balancing acceptance of a diagnosis with a desire to fight for recovery.

- Finding moments of joy and peace amidst challenging times:
- Finding moments of joy and peace amidst challenging times through self-care and positive activities.

Perspectives

- Coping with a serious illness:
- Plus: Offers opportunities for personal growth, strength, and

resilience.

- Minus: Can be emotionally and physically draining, impacting mental health and relationships.
- Interesting: The way individuals cope with a serious illness can vary greatly, showcasing the resilience and adaptability of the human spirit.
- Finding moments of joy and peace amidst challenging times:
- Plus: Can provide moments of relief and happiness, helping individuals cope with difficulties.
- Minus: It may be difficult to find moments of joy in the midst of challenging times, leading to feelings of despair and hopelessness.
- Interesting: The power of finding small moments of joy and peace in the midst of adversity can be incredibly impactful and showcase the strength of the human spirit.

What is missing

- How can therapy or counseling help in navigating the emotional challenges of facing a diagnosis?
- What role can alternative healing practices, such as meditation or acupuncture, play in managing the emotional and physical impact of a serious illness?
- How can connecting with a support group or online community provide additional support and understanding during a health crisis?
- What role can family members play in providing emotional support and practical assistance during a difficult time?
- How can maintaining a healthy lifestyle through diet, exercise, and mindfulness practices support overall well-being while facing a diagnosis?
- What resources are available for patients to access for additional information, support, and guidance during their health journey?

Alternative Viewpoints

- Psychiatrist: Focus on mental health and coping strategies such as therapy or medication to manage the emotional aspects of a serious diagnosis.
- Nutritionist: Emphasize the importance of a healthy diet and proper nutrition in supporting the body's ability to heal and recover.
- Life coach: Provide guidance on setting goals, staying motivated, and maintaining a positive mind-set throughout the journey of facing a diagnosis.
- Alternative medicine practitioner: Offer holistic approaches such as acupuncture, herbal remedies, or mindfulness practices to support physical, emotional, and spiritual well-being during a challenging time.

Interested Audiences

- Patients newly diagnosed with a serious illness: They would be interested in these topic questions as they navigate their emotions, fears, and uncertainties surrounding their diagnosis and treatment options.
- Caregivers and loved ones of patients with serious illnesses: They may be interested in understanding how to support and provide emotional guidance to their loved one facing a challenging health journey.
- Healthcare professionals: Healthcare professionals may benefit from these topic questions to better understand the emotional needs and concerns of their patients, and how to provide holistic care and support.
- Mental health professionals: Mental health professionals may find these topic questions relevant in helping their clients cope with the emotional challenges of a serious illness and navigate the complex emotions that come with such a diagnosis.

- Faith-based communities: Individuals in faith-based communities may be interested in these topic questions to explore how their faith can provide strength, hope, and comfort during difficult times of illness and uncertainty.

Opposing Audiences

- Some individuals who may oppose the topic of finding strength and hope while facing a serious illness could be those who have a more pessimistic outlook on life. They may believe that dwelling on positivity and hope is unrealistic and prefer to focus on the harsh reality of the situation. They may feel that accepting the worst-case scenario is a more practical approach.
- Certain healthcare professionals who prioritize a more clinical and realistic approach to illness management may oppose the topic of finding moments of joy and peace amidst a challenging time. They may feel that focusing on emotional well-being distracts from the medical treatment and may not see the value in activities that bring happiness and peace.
- Some individuals who have had negative experiences with their own health challenges may oppose the idea of balancing acceptance with a desire to fight for recovery. They may feel that acceptance equates to giving up or not trying hard enough to overcome the illness. They may believe that relentless fighting is the only way to approach a serious diagnosis.
- Atheists or individuals who do not subscribe to a particular faith, may oppose the topic of leaning on one's faith or trust in a higher power for strength while facing an illness. They may feel that relying on religious beliefs is not a valid coping mechanism and may prefer to focus on practical solutions and support systems grounded in reality.

Innovations

Products:

- Meditation apps or devices that help individuals find moments of peace and calmness during challenging times.
- Wellness kits or subscription services that provide self-care products such as candles, bath bombs, and journals to promote relaxation and self-reflection.

Services:

- Support groups or online communities for individuals coping with serious illnesses, providing a space for sharing experiences and finding comfort in others going through similar situations.
- Therapy services specifically tailored for individuals facing a serious illness, focusing on coping mechanisms and mental health support.

Experiences:

- Retreats or workshops focused on mindfulness and positivity, allowing individuals to disconnect from their daily stressors and focus on finding moments of joy and peace.
- Nature therapy experiences, such as forest bathing or ecotherapy, to promote healing and wellness through connecting with the outdoors.

Policies:

- Policies that provide paid time off for individuals dealing with a serious illness or caring for a loved one undergoing treatment, allowing them the flexibility to focus on their health and well-being.
- Healthcare policies that prioritize mental health support for individuals facing serious illnesses, ensuring access to therapy and counseling services as part of their treatment plan.

Table 5: Six Sets of Innovations Generated by Ai in Bimileap.com based upon Six Iterations. Altogether, 18 Iterations were run, but Space Permits the Results of Only a Few Iterations to be Presented Here.

Iteration 1: Online Support Groups or Virtual Counseling Services Tailored Specifically for Individuals Coping with Difficult Diagnoses.

- Subscription boxes curated with items to promote positivity and self-care, such as mindfulness tools, inspirational books, and wellness products.
- Mobile apps designed to connect individuals with loved ones for emotional support and encouragement.
- Personalized self-care plans created by healthcare professionals to empower individuals to take control of their health and well-being.
- Resilience-building workshops or retreats focused on teaching coping strategies and stress management techniques.
- Tools or platforms for improved communication between patients and healthcare providers to ensure clear and open dialogue about diagnosis, treatment options, and concerns.
- Gratitude journals or gratitude-focused apps to help individuals cultivate a gratitude practice and shift their perspective towards positivity.
- Daily inspiration or affirmation cards to provide encouragement and motivation for taking each day as it comes and facing challenges with strength and resilience.

Iteration 2: Online Support Communities and Virtual Support Groups for Patients Undergoing Illness, Providing A Platform for Connection and Sharing Experiences.

- Wellness apps which focus on mental health support, positivity, and resilience building through guided meditation, mindfulness exercises, and affirmations.
- Personalized health coaching services which help patients navigate their health journey, set goals, and stay motivated.
- Telemedicine services which offer virtual consultations with healthcare providers, allowing patients to easily access medical advice and support from the comfort of their own home.
- Healthcare navigation services which help patients understand their treatment options, connect with specialists, and navigate the healthcare system effectively.
- Advocacy organizations which provide resources, education, and support to empower patients to advocate for themselves in healthcare decisions.
- Patient-centered policies which prioritize patient autonomy, informed decision-making, and respectful communication in healthcare settings.

Iteration 3: Mindfulness Apps and Online Resources for Coping With Fear and Anxiety, Such as Guided Meditation and Breathing Exercises Tailored to Individuals Dealing with Illness.

- Integrative medicine practices which combine traditional medical treatments with holistic approaches, like acupuncture, massage therapy, and nutrition counseling.
- Virtual support groups and online communities for individuals facing similar health challenges, providing a safe space for sharing experiences and finding emotional support.
- Personalized wellness plans developed in collaboration with healthcare professionals, focusing on nutrition, exercise, stress management, and mental health support.
- Wellness retreats and workshops designed specifically for individuals navigating illness, offering a holistic approach to healing and self-care in a supportive environment.

Iteration 4: Resilience and Positivity Workshops: Workshops Focus on Building Resilience, Staying Positive, and Finding Joy in Everyday Life Through Various Activities & Techniques.

- Virtual Support Groups: Online support groups where individuals can connect with others facing similar challenges and share their fears and concerns in a safe and supportive environment.
- Mindfulness and Meditation Apps: Apps which provide guided mindfulness and meditation practices to help individuals cope with fear and uncertainty in order to find peace and calm in their daily lives.
- Wellness Retreats: Retreats focused on promoting stability and normalcy by providing a space for individuals to unwind, relax, and engage in self-care practices to rejuvenate their mind, body, and soul.
- Adaptive Technology: Technological solutions which help individuals with illness to adapt to their new circumstances and continue to live a fulfilling life, such as assistive devices, home automation, and accessible apps and programs.

Iteration 5: Online Support Groups or Therapy Services Specifically Tailored for Individuals Coping with Fear and Uncertainty Related to Serious Illnesses.

- Mindfulness and meditation apps focused on promoting positivity and hope in times of uncertainty.
- Personalized empowerment coaching programs to help individuals regain a sense of control and empowerment in their lives.
- Wellness retreats or workshops which focus on finding a balance between seriousness and normalcy in daily life.
- Healthcare policies which prioritize mental health support and resources for individuals facing uncertainty and fear related to serious illnesses.

Iteration 6: Personal development and empowerment:

- Online self-improvement courses or workshops focused on building self-awareness and resilience
- Personalized coaching services to help individuals set and achieve personal development goals
- Support systems and community: Online support groups and forums for individuals facing similar challenges or seeking connection
- Community-based programs which offer resources and workshops for building support networks
- Mindfulness apps or subscription services which offer guided meditation sessions and daily gratitude prompts
- Virtual wellness retreats which focus on mindfulness practices and gratitude exercises

Discussion and Conclusions

The ability to do the simulation requires only minutes to create the prompts. 15-20 seconds an iteration means that within 30 minutes, the medical professional as well as the patient can educate themselves.

The four-phase strategy to improve doctor-patient communication with newly diagnosed cancers will considerably help medicine. This approach can make cancer treatment more supportive, informative, and empowering for patients. AI technology will help patients feel more connected to others going through similar situations, provide precise information and clarity about their health, answer their queries quickly and accurately, and offer revolutionary treatment techniques based on AI analyses. This can improve mental health, treatment outcomes, and healthcare satisfaction.

This technique can improve medical professionals' communication, empathy, and patient-centered care. Doctors may better understand

their patients' needs, personalize their communication, and keep current on cancer research and trends by participating in support groups, answering queries, using AI technologies, and designing creative treatment plans. This can improve patient outcomes, satisfaction, and practice satisfaction and effectiveness.

Acknowledgements

The authors wish to acknowledge the ongoing help of Vanessa Marie B. Arcenas and Angela Louise C. Aton of the Tactical Data Group for help in preparing this manuscript for publication.

References

1. Marschollek P, Bąkowska K, Bąkowski W, Marschollek K, Tarkowski R (2019) Oncologists and breaking bad news—from the informed patients' point of view. The evaluation of the SPIKES protocol implementation. *J Cancer Educ* 34: 375-380.
2. Paul CL, Clinton-McHarg T, Sanson-Fisher RW, Douglas H, Webb G (2009) Are we there yet? The state of the evidence base for guidelines on breaking bad news to cancer patients. *Eur J Cancer* 45: 2960-2966.
3. Al-Johani WM, AlShamlan NA, AlGhamdi MF, AlAbdulkader AM, Aljohani WM, et al. (2022) Breaking bad news of a cancer diagnosis: A mixed-methods study of patients' perspectives. *Patient Prefer Adherence* 16: 3357-3369.
4. Krieger T, Salm S, Dresen A, Cecon N (2023) Cancer patients' experiences and preferences when receiving bad news: a qualitative study. *J Cancer Res Clin Oncol* 149: 3859-3870.
5. Alshammary S, Hamdan A, Saleem LA, Ratnapalan S, Duraisamy B (2017) Physicians' perceptions of breaking bad news to cancer patients and family. *J Health Spec* 5: 192-192.
6. Alshammary SA, Hamdan AB, Tamani JC, Alshuhil A, Ratnapalan S, et al. (2017) Breaking bad news among cancer physicians. *J Health Spec* 5: 66.
7. Mostafavian Z, Shaye ZA (2018) Evaluation of physicians' skills in breaking bad news to cancer patients. *J Fam Med Prim Care* 7: 601-605.
8. Holderried F, Stegemann Philipps C, Herschbach L, Moldt JA, Nevins A, et al. (2024) A generative pretrained transformer (GPT)-powered chatbot as a simulated patient to practice history taking: Prospective, mixed methods study. *JMIR Med Educ* <https://www.scienceopen.com/document?vid=14ae152c-c905-4b30-a9de-70fbe2068a18>.
9. Ong H, Ong J, Cheng R, Wang C, Lin M, et al. (2023) GPT technology to help address longstanding barriers to care in free medical clinics. *Ann Biomed Eng* 51: 1906-1909.
10. Bottomley A, Hunton S, Roberts G, Jones L, Bradley C (1996) A pilot study of cognitive behavioral therapy and social support group interventions with newly diagnosed cancer patients. *J Psychosoc Oncol* 14: 65-83.
11. Taylor SE, Falke RL, Shoptaw SJ, Lichtman RR (1986) Social support, support groups, and the cancer patient. *J Consult Clin Psychol* 54: 608.
12. Ussher J, Kirsten L, Butow P, Sandoval M (2006) What do cancer support groups provide which other supportive relationships do not? The experience of peer support groups for people with cancer. *Soc Sci Med* 62: 2565-2576.
13. Finlay IG, Stott NCH, Kinnersley P (1995) The assessment of communication skills in palliative medicine: A comparison of the scores of examiners and simulated patients. *Med Educ* 29: 424-429.
14. Johnson LA, Gorman C, Morse R, Firth M, Rushbrooke S (2013) Does communication skills training make a difference to patients' experiences of consultations in oncology and palliative care services? *Eur J Cancer Care* 22: 202-209.
15. Wilkinson S, Roberts A, Aldridge J (1998) Nurse-patient communication in palliative care: An evaluation of a communication skills programme. *Palliat Med* 12: 13-22.
16. Iqbal MJ, Javed Z, Sadia H, Qureshi IA, Irshad A, et al. (2021) Clinical applications of artificial intelligence and machine learning in cancer diagnosis: Looking into the future. *Cancer Cell Int* 21: 21-270.
17. Sebastian AM, Peter D (2022) Artificial intelligence in cancer research: Trends, challenges and future directions. *Life* 12: 1991.
18. Sufyan M, Shokat Z, Ashfaq UA (2023) Artificial intelligence in cancer diagnosis and therapy: Current status and future perspective. *Comput Biol Med* 165: 107356.
19. Berry LL (2019) Service innovation is urgent in healthcare. *AMS Rev* 9: 78-92.
20. Nothaft F, Power B (2024) The most disruptive near-term use of AI in cancer care: Patient empowerment through software agents. *AI Precision Oncol* <https://www.liebertpub.com/doi/10.1089/aipo.2024.0027>.
21. Patel S, Goldsack JC, Cordovano G, Downing A, Fields KK, et al. (2023) Advancing digital health innovation in oncology: Priorities for high-value digital transformation in cancer care. *J Med Internet Res* 4: 25- 43404.
22. Scrivner Jr JH (2024) The adoption of AI technological innovation in hospital systems: The case of computer-assisted diagnosis adoption and diffusion (Doctoral dissertation, Sullivan University).
23. Wood S, Schulman K (2019) The doctor-of-the-future is in: Patient responses to disruptive health-care innovations. *J Assoc Consum Res* 4: 231-243.

Copyright: ©2025 Howard R Moskowitz, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.