

# Searching for a Local Neurologist to Treat Parkinson's Symptoms: An Exploration Using Artificial Intelligence Powered by Mind Genomics Thinking

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## Abstract

This paper focuses on the criteria that newly diagnosed patients and their families may use to find a neurologist for Parkinson's disease. The paper combined the world-view of Mind Genomics with the generative ability of AI (Artificial Intelligence) in the form of Large Language Models (LLM). The approach posits the existence of a limited number of mind-sets and requests the AI identify these mind-sets, and then answer several questions for each mind-set. The approach is efficient, returns with different mind-sets, which make intuitive sense, and presents a way to learn about a topic in medicine where the information pertains to the mind of the patient or family, rather than to clinical and technical issues. The paper shows how AI provides both initial information about the mind-set, and deeper information based upon a set of pre-programmed prompts for teaching purposes, this set called SCAS, Socrates as a Service. SCAS provides different perspectives about the topic, suggests new ways of thinking about the issues, and suggests innovations. We propose a method to increase subject learning and critical thinking.

## Keywords

Artificial intelligence, Large language model, Mind Genomics, Neurologist, Parkinson's.

## ABBREVIATIONS

AI: Artificial Intelligence, LLM: Large Language Model, OLS: Ordinary Least Squares, SCAS: Socrates as a Service.

## INTRODUCTION

People sometimes struggle to find physicians, particularly when relocating to a new area or after being diagnosed with a new ailment. Much has been published on the clinical aspects of health and disease, but little in depth on how patients choose physicians for severe medical issues [1-4]. The reality, however, is that during one's life each individual in a developed country is likely to need the help of a specialist doctor. The fact that there is a thriving world of medical specialists, without massive turnover, means that the selection process is successful, or perhaps the change process is tortuous, forcing people to stay with specialists who do not seem to satisfy their needs. There is no such "cry" from the public about dissatisfaction with medical specialists as a rampant phenomenon. We must conclude, therefore, that people tend to stay with the specialists that they choose. What then are the ways that people search for these specialist doctors?

The published literature presents to the reader some standard types of studies, where the respondent, the patient, participates in an in-depth interview or in a survey, these studies dealing with the criteria for choosing a particular type of doctor [5-7]. There are relatively few of these studies.

This paper moves the topic in a different direction, by working with AI, specifically large language models (LLM). These LLMs are challenged to answer specific questions about the criteria used by people to select a specialist. LLMs have reached the point that they can behave as if they were people, in terms of "understanding the question" and returning seemingly meaningful answers. In this spirit, the present "AI-based experiment" was set up to answer questions about criteria people use to select a new specialist for Parkinson's disease. The article explores decision-making utilizing LLMs, AI, Mind Genomics, and new research to learn about population mind-sets.



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## The Contribution of Mind Genomics to Understanding Decision-Making

It's easiest to understand the approach by first looking at the contribution of Mind Genomics. Mind Genomics is an emerging science, which looks at the nature of how we judge aspects of our everyday life. Rather than putting the respondent or the subject into an artificial situation, Mind Genomics takes descriptive phrases about situations of daily life, mixes these together by experimental design to create "vignettes" (viz., combinations), presents these vignettes to people (respondents) who assign ratings, and then analyzes the ratings to identify which phrases drive the response [8-10].

Although the foregoing approach seems convoluted, the reality is that the response to mixtures mirrors what occurs in daily life. Rather than having a set of criteria that are clear, for the most part people simply react to the moments of everyday life in a way which is consistent, but not clearly conscious, and not thought about much. The late Nobel Laureate, Daniel Kahneman, called this System 1 thinking [11].

Mind Genomics makes use of this System 1 thinking. We can imagine a person sitting in front of a computer, thinking about searching for a new doctor, a neurologist, to deal with a recently diagnosed disease, e.g., Parkinson's disease. The vignettes all deal with the characteristics of the neurologist, and the person. The vignettes seem to constitute a "blooming, buzzing confusion" in the words of Harvard's leading 19th Century psychologist, William James [12].

The actual analysis of the results quickly reveals how the person thinks. Some combinations will be interesting to the person, some combinations will not be interesting. We really cannot predict which combinations will be interesting. The person starts out confused, but quickly finds it easy to read the vignettes, or at least graze through them, and rate each one. At the end of the exercise, the data are analyzed by OLS (ordinary least squares) to identify the degree to which each descriptive phrase "drives" the responses. Finally, after all the individual data are collected and analyzed, the process finishes by clustering the individuals, the respondents, into groups called "mind-sets." The mind-sets look at different criteria to make their decision.

The process has been well documented for use in medicine [13], law [14], studies of the social order [15], and of course for products and services [16]. The work began in the late 1980s until now, and continues unabated. What is new today, as of this writing (2024), is the use of AI and Mind Genomics thinking with LLM (large language models) to synthesize mind-sets [17].

## Working with LLM to Understand Motivation

With increasing experience using artificial intelligence in the Mind Genomics platform, it emerged that when the LLM to summarize the "meanings" of mind-sets based upon the strong performing elements for the mind-set, the LLM appeared to do quite a good job. That is, when the LLM was fed the list of the "defining" elements of the mind-set, the LLM was able to answer many questions about the mind-set, ranging from naming the mind-set to presenting alternative ideas, and even suggest innovations. That is, the empirical work provided the data to show the strong elements, but it was the AI which provided the deeper information.

With these observations, there arose a specific set of prompts, usable by anyone, to identify the way people think. This has been called SCAS, Socrates as a Service. SCAS has been incorporated into the Mind Genomics platform through a simple interface called Idea

Coach. After several iterations it became obvious that SCAS could be instructed to simulate the Mind Genomics study, albeit in a simpler fashion. It is that simulation for the topic of finding a new neurologist for a diagnosed case of Parkinson's disease that will constitute the rest of this. In a sense, one can look at the paper as an LLM simulation.

## Briefing the LLM

Table 1 shows the briefing. The LLM needs the request correctly formatted. The language shown in Table 1 "works" because there is no ambiguity, or at least no ambiguity which caused difficulties. Table 1 begins with the background to the topic, posits the existence of mind-sets, and then proceeds to populate the briefing.

**Table 1:** The briefing given to SCAS, which in turn delivers the document to the LLM.

We are studying the mind-set of people who have just moved into a neighborhood and are searching for a Neurologist who can work with a newly diagnosed case of Parkinson's disease. We know that there are six mind-sets of people that have been identified in terms of how they look for a Neurologist when confronted with a serious neurological disorder. For each mind-set, answer the following questions clearly.

1. What is the name of the Mind-Set: Put in capital letters
2. What does the mind-set look for? Use six slogans to tell us what the mind-set looks for, and for each slogan rate the degree of success that slogan will have in helping the person find the right neurologist. Use a scale from 1 to 5 (1 = slogan doesn't really help concretize the way they think... 5 = slogan absolutely concretizes the way they think).
3. What are the typical words the mind-set uses to ask neighbors and friends for a recommendation? Make these quotes, in the way a person talks. Use italics for all quotations.
4. What are the typical words to which the mind-set responds and feels comfortable with the recommendation? Use the words that the person would like to hear from the Neurologist. Use italics for all quotations.
5. Summarize in one paragraph of six sentences how the mind-set tells the family about the new Neurologist, before the family meets the new Neurologist. Make this paragraph follow the way a person talks to her or his family.
6. What are five strong positives for choosing a Neurologist for this mind-set?
7. What are five strong danger signals for rejecting a Neurologist for this mind set?
8. Summarize in one paragraph of six sentences how the mind-set tells relatives (e.g., children) about the new Neurologist, knowing that the relatives will never meet the Neurologist. Follow this by four relevant slogans.
9. Summarize in one paragraph of six sentences what the mind-set will tell friends when asked to describe what they think about the Neurologist, knowing that the friends will never meet the Neurologist. Follow this by four relevant slogans.

## The Traditionist Mind-Set

Table 2 shows a slightly edited version of one of the first outputs from SCAS. The word "edited" is used to acknowledge that there are some spacing changes, centering, etc., done to present a more readable table. Some of the spacing was not specified because the information was present to SCAS in a user-friendly format in Table 1, not a machine-specific format. It ends up being a straightforward task to change some of the spacing to make the output more presentable, a small enough price to pay for a general, user-friendly input shown by Table 1. When looking at the results in Table 2, the reader should

keep in mind that the questions and the answers are presented in the language of the ordinary person, rather than in technical or academic language.

It is clear from Table 2 that the underlying LLM has produced a reasonable facsimile of a mind-set, this so-called "Traditionalist" Mind-Set. What is important is that the mind-set makes a great deal of sense. Reading the specifics of the mind-set, even the simulated quotes give a sense that "I've seen this person." The critical thinking has begun, with the reader of Table 2 now empowered to ask more questions and think of answers.

Table 3 shows Question 2 (what the mind-set looks for), this time for eight mind-sets. Each iteration using the underlying LLM is done entirely without memory of previous iterations. Therefore, although the orientation and information provided to SCAS and the AI was that "We know that there are six mind-sets of people," the lack of memory in the system and the ease of running one iteration after the other ended by generating eight different mind-sets.

A key benefit of LLM and AI is the ability to look at material through new prompts. SCAS, Socrates as a Service, provides the user with nine prompts built in. Table 4 shows the LLM answer to these prompts

**Table 2:** Immediate results from one iteration, returning with the Traditionalist mind-set. The output of Table 2 is slightly edited to make the reading easier.

<b>1. Mind-Set Name</b>	
TRADITIONALIST	
<b>2. What the Mind-Set Looks For</b>	
What is familiar and trusted in the community	Relevance = 5
What is recommended by a family member or close friend	Relevance = 4
A doctor with a longstanding reputation in the neighborhood	Relevance = 4
A doctor who has treated multiple family members in the past	Relevance = 3
A doctor with a prestigious academic background	Relevance = 3
A doctor who is well known by local community leaders	Relevance = 2
<b>3. Typical Words the Mind-Set Uses to Ask Neighbors and Friends for a Recommendation</b>	
Hey, I just moved into the neighborhood and was wondering if you knew of a good neurologist in the area?	
<b>4. Typical Words to Which Make the Mind-set Comfortable with the Recommendation</b>	
I've been recommended Dr. Smith by a few neighbors, and they all speak highly of his expertise and care.	
<b>5. How the Mind-Set Tells the Family</b>	
When discussing the new Neurologist with their family, a Traditionalist may say, "I heard about this doctor from our neighbors, and they all trust him to take good care of us. He has a great reputation in the community, and I feel confident in his abilities. I think he will really help improve our situation."	
<b>6. Five Strong Positives for Choosing a Neurologist</b>	
Familiarity, Trustworthiness, Established reputation in the community, Recommendations from close friends or family, Track record of successful treatments	
<b>7. Five Strong Danger Signals for Rejecting a Neurologist</b>	
Negative reviews or rumors within the community, Lack of personal recommendations, Doctor with a controversial background, Doctor who is not well known in the neighborhood, Doctor with a history of malpractice	
<b>8. What the Mind-Set Tells Relatives (e.g., children) about the New Neurologist</b>	
When informing relatives about the new Neurologist, a Traditionalist may say, "Our neighbors recommended this doctor, and I trust their judgment. They say he is highly skilled and caring, and I feel comfortable with his approach. I believe he will help us get through this difficult time." Slogans: Trust in the community, Familiar recommendations, Expertise you can rely on, Care that comes highly recommended	
<b>9. What the Mind-Set Tells Friends when Asked</b>	
When describing the Neurologist to friends, a Traditionalist may say, "Our new doctor was recommended by our neighbors, and they all have great things to say about him. He has a strong reputation in the community and is known for his expertise. I feel confident in his abilities to help us with our situation." Slogans: Trusted local recommendation, Established community reputation, Expertise and care you can count on, Confidence in the doctor's abilities	

**Table 3:** "What the mind-set looks for" (Question 2). Emerging from eight separate iterations, each iteration having generated a different mind-set. The table is slightly edited for readability. Within each mind-set the questions are sorted by their relevance scores generated by the LLM.

<b>1. TRADITIONALIST</b>	
1. What is familiar and trusted in the community	Relevance = 5
2. What is recommended by a family member or close friend	Relevance = 4
3. A doctor with a longstanding reputation in the neighborhood	Relevance = 4
4. A doctor who has treated multiple family members in the past	Relevance = 3
5. A doctor with a prestigious academic background	Relevance = 3
6. A doctor who is well known by local community leaders	Relevance = 2
<b>2. RESEARCHER</b>	
1. "Personal recommendation from a trusted source"	Relevance = 5
2. "Top rated neurologists in the area"	Relevance = 5
3. "Specializes in Parkinson's disease treatment"	Relevance = 4
4. "Positive patient testimonials"	Relevance = 4
5. "Accepts insurance coverage"	Relevance = 3
6. "Convenient location and office hours"	Relevance = 2
<b>3. INVESTIGATOR</b>	
1. "Seeks a Neurologist who stays UpToDate on the latest research and treatments."	Relevance = 5
2. "Seeks recommendations from trusted medical professionals in the field."	Relevance = 5
3. "Looks for a Neurologist with extensive experience in treating Parkinson's disease."	Relevance = 4
4. "Believes in importance of a Neurologist who values patient input and collaboration."	Relevance = 4
5. "Prefers a Neurologist who is actively involved in the medical community."	Relevance = 4
6. "Values a Neurologist who takes a holistic approach to patient care."	Relevance = 3
<b>4. SEARCHER</b>	
1. "Experienced in treating Parkinson's disease"	Relevance = 5
2. "Good reputation in the medical community"	Relevance = 5
3. "Patient centered care"	Relevance = 4
4. "Accessible location and appointment availability"	Relevance = 4
5. "Excellent communication skills"	Relevance = 3
6. "Understanding of holistic approaches to treatment"	Relevance = 2
<b>5. INQUIRER</b>	
1. "Highly recommended by multiple sources"	Relevance = 5
2. "UpToDate on latest research and treatments"	Relevance = 5
3. "Known for compassionate and personalized care"	Relevance = 4
4. "Convenient location and hours"	Relevance = 3
5. "Accepts insurance and offers affordable options"	Relevance = 3
<b>6. INSTINCTUAL</b>	
1. "Trust your gut instinct"	Relevance = 5
2. "Your instinct knows best"	Relevance = 5
3. "What's your gut telling you?"	Relevance = 5
4. "Listen to your intuition"	Relevance = 4
5. "Go with your initial feeling"	Relevance = 4
6. "Follow your inner voice"	Relevance = 3
<b>7. SEARCH ENGINE SEEKERS</b>	
1. "Top rated neurologists in the area"	Relevance = 5
2. "Neurologists with convenient appointment times"	Relevance = 4
3. "Neurologists with positive patient reviews"	Relevance = 4
4. "Neurologists with specialized experience in Parkinson's disease"	Relevance = 4
5. "Neurologists recommended by other healthcare professionals"	Relevance = 3
6. "Neurologists covered by insurance"	Relevance = 3
<b>8. ELITE SEEKERS</b>	
1. "Top rated in the field"	Relevance = 5
2. "Specialized in Parkinson's disease"	Relevance = 5
3. "High success rate with patients"	Relevance = 5
4. "Exceptional credentials"	Relevance = 4
5. "Known for cutting edge treatments"	Relevance = 4
6. "Located in prestigious medical facility"	Relevance = 3

**Table 4:** Deeper AI Analysis for the Traditionalist Mind-Set based upon nine prompts built-in to SCAS, Socrates as a Service.

### 1. Key Ideas

1. The importance of community reputation and trust in choosing a neurologist for a Traditionalist
2. The role of personal recommendations from neighbors and friends in the decision-making process
3. How familiarity and established reputation in the neighborhood influence a Traditionalist's choice
4. The significance of feeling comfortable and confident in the neurologist's abilities for a Traditionalist
5. Potential danger signals such as negative reviews, controversial backgrounds, and lack of personal recommendations to watch out for

### 2. Themes

Importance of Community Reputation and Trust:

1. The significance of community reputation and trust in selecting a neurologist
2. The role of personal recommendations from neighbors and friends in decision-making
3. Familiarity and established reputation in the neighborhood influencing choice
4. Significance of feeling comfortable and confident in neurologist's abilities

### 3. Potential Danger Signals

1. Negative reviews as a warning sign
2. Controversial backgrounds of neurologists to be cautious of
3. Lack of personal recommendations as a red flag to watch out for

### 4. Perspectives

1. Importance of Community Reputation and Trust:

Plus: Provides a sense of security and confidence in the neurologist's abilities

Minus: Limited options and potential biases in recommendations from a small community

Interesting: Cultural differences in what constitutes a strong reputation and trustworthiness in different communities

2. Potential Danger Signals:

Plus: Allows patients to be aware of potential risks and make informed decisions

Minus: False or misleading reviews leading to misinformation

Interesting: How social media and online platforms can impact a neurologist's reputation and perception of trustworthiness in the community

### 5. Interested Audiences

1. Medical professionals and doctors looking to understand the mind-set of Traditionalist patients and how they choose their healthcare providers
2. Healthcare marketers and professionals interested in reaching out to Traditionalist patients and understanding their preferences in selecting doctors
3. Patients who are Traditionalists themselves and want to learn more about how their mind-set influences their decision-making process when choosing a doctor
4. Community leaders and organizations looking to work with Traditionalist individuals in promoting healthcare services and providers within the neighborhood
5. These audiences would be interested in the topic questions because they provide insights into the specific factors and considerations that Traditionalists prioritize when selecting a neurologist or any healthcare provider. Understanding these preferences can help in catering to the needs and expectations of Traditionalist patients, ultimately improving patient satisfaction and trust in the healthcare system.

### 6. Opposing Audiences

Audiences that might oppose the topic of a Traditionalist mind-set in choosing a neurologist could include:

1. Progressive individuals who prioritize modern and innovative medical practices over traditional methods
2. Individuals who value individual research and online reviews over personal recommendations from neighbors and friends
3. Health advocates who prioritize factors such as diversity, inclusivity, and patient centered care over community reputation and familiarity
4. Younger generations may prefer doctors with a strong online presence and social media engagement rather than relying on word-of-mouth recommendations
5. Individuals who have had negative experiences with doctors recommended by their community and therefore do not trust traditional methods of selecting a healthcare provider

### 7. What is Missing

1. How does a Traditionalist typically research a potential Neurologist before making a decision?
2. What level of importance does a Traditionalist place on the doctor's bedside manner and communication skills?
3. How does a Traditionalist handle potential conflicts between personal recommendations and negative reviews of a Neurologist?
4. What other factors besides reputation and recommendations influence a Traditionalist's decision in choosing a Neurologist?
5. How does a Traditionalist navigate potential financial considerations when selecting a Neurologist?
6. What steps does a Traditionalist take to establish a good relationship with their chosen Neurologist after making a decision?

### 8. Alternative Viewpoints

1. A more modern mind-set might prioritize the doctor's use of the latest technology and research in their practice rather than relying solely on community reputation.
2. An individualistic mind-set might place more importance on their own research and personal preferences rather than seeking recommendations from others.
3. A skeptical mind-set might question the validity of community recommendations and prefer to conduct thorough research on the doctor's background and qualifications before making a decision.
4. A global perspective might value diversity and different cultural approaches in healthcare, seeking out a neurologist who specializes in a specific area of interest or has experience treating a diverse range of patients.

**9. Innovations**

1. Community based Neurologist Referral Program: A program that encourages community members to recommend trusted neurologists to their neighbors and friends, promoting a sense of trust and reliability.
2. Neurologist Background Check Service: A service that provides comprehensive background checks on neurologists to ensure patients are aware of any potential controversies or red flags before making a decision.
3. Online Reputation Management for Neurologists: A service that helps neurologists manage their online reputation by monitoring and responding to reviews, ensuring a positive image in the community.
4. Community Neurologist Meet and Greet Events: Events where community members can meet and interact with local neurologists, fostering trust and confidence in their abilities.
5. Community Neurologist Ratings and Reviews Platform: A platform where patients can rate and review neurologists in their community, providing valuable feedback and transparency for others in the decision-making process

**Table 5:** Deeper analysis of 12 “SCAS-suggested” innovations.

**Deeper Analysis of 12 “SCAS-suggested” Innovations**

**1. COLLABORATIVE CARE PARTNERSHIPS:**

Collaborative care partnerships with other healthcare providers to offer comprehensive and holistic treatment for Parkinson’s disease patients.

Contribution of innovation: Comprehensive care models that involve multiple healthcare professionals can address the diverse needs of Parkinson’s disease patients and improve overall outcomes.

Importance = 5, Uniqueness = 4, 2-Year-Horizon = 5, Disruptive = 4

**2. PERSONALIZED TREATMENT:**

Personalized treatment plans incorporating the latest research and advancements in Parkinson’s disease management.

Contribution of innovation: Customized treatment plans are crucial for optimizing outcomes and managing symptoms effectively in Parkinson’s disease patients.

Importance = 5, Uniqueness = 4, 2-Year-Horizon = 5, Disruptive = 4

**3. TELENEUROLOGY:**

Telemedicine consultations for Parkinson’s disease patients to access specialized neurologists without the need for travel.

Contribution of innovation: This innovation is highly important as it provides convenient access to specialized care for Parkinson’s disease patients, especially those who may have mobility issues or live in remote areas.

Importance = 5, Uniqueness = 5, 2-Year-Horizon = 5, Disruptive = 4

**4. SUPPORT COMMUNITY:**

Patient support groups facilitated by the neurologist to provide a community for those living with Parkinson’s disease.

Contribution of innovation: Support groups can significantly improve the emotional wellbeing and quality of life for Parkinson’s disease patients, making it a valuable addition to their treatment plan.

Importance = 4, Uniqueness = 4, 2-Year-Horizon = 4, Disruptive = 3

**5. VIRTUAL REALITY THERAPY:**

Virtual reality therapy sessions for Parkinson’s disease patients to improve mobility and quality of life.

Contribution of innovation: Virtual reality therapy has the potential to revolutionize rehabilitation and improve motor function in Parkinson’s disease patients.

Importance = 4, Uniqueness = 4, 2-Year-Horizon = 4, Disruptive = 3

**6. COMMUNITY BASED REVIEWS:**

Online directory or platform specifically for neurologist reviews and recommendations.

Contribution of innovation: Community based reviews can help patients make informed decisions and choose reputable neurologists for their Parkinson’s disease treatment.

Importance = 3, Uniqueness = 3, 2-Year-Horizon = 3, Disruptive = 2

**7. TELENEUROLOGY APPOINTMENTS:**

Telemedicine services for neurology appointments, reducing the need for travel. Contribution of innovation: Telemedicine appointments can enhance accessibility to neurology care and streamline the healthcare process for patients with Parkinson’s disease.

Importance = 4, Uniqueness = 3, 2-Year-Horizon = 4, Disruptive = 3

**8. REFERRAL PROGRAM:**

Neurologist referral program offering discounts or incentives for high rated providers.

Contribution of innovation: Referral programs can encourage patient loyalty and help top rated neurologists attract new clients.

Importance = 3, Uniqueness = 3, 2-Year-Horizon = 3, Disruptive = 2

**9. COMPARISON TOOLS:**

Neurologist comparison tools on healthcare websites for easier decision-making.

Contribution of innovation: Comparison tools can assist patients in selecting the right neurologist for their needs, contributing to improved care outcomes.

Importance = 3, Uniqueness = 3, 2-Year-Horizon = 3, Disruptive = 2

### 10. DECISION-MAKING APPS:

Decision-making apps or tools that help individuals weigh their options and consider different factors before making a decision.

Contribution of innovation: Decision-making tools can empower patients to take an active role in their healthcare decisions and enhance their overall experience.

Importance = 3, Uniqueness = 3, 2-Year-Horizon = 3, Disruptive = 2

### 11. DECISION-MAKING COUNSELING:

Decision-making coaching services for balancing instincts with critical thinking.

Contribution of innovation: Counseling services can help patients navigate complex decisions and achieve a balance between intuition and rationality in their healthcare choices.

Importance = 3, Uniqueness = 3, 2-Year-Horizon = 3, Disruptive = 2

### 12. LOYALTY PROGRAMS:

The neurology loyalty program offering perks for repeat patients and positive reviews.

Contribution of innovation: Loyalty programs can improve patient retention and satisfaction but may not significantly impact the overall healthcare landscape.

Importance = 2, Uniqueness = 2, 2-Year-Horizon = 2, Disruptive = 1

for the Traditional Mind-Set. This deeper analysis is done for each iteration, and returned in an Excel workbook, about 30 minutes after the end of the study.

The important thing to keep in mind is that with a simple set of instructions, the user can get an entire education in critical thinking about the topic. This does not mean that this is all the information that the user needs. Instead of having to formulate the problem and then spending a great deal of time searching for the information, it may become possible to learn in minutes what might have taken months.

The final analysis expands on the different innovation ideas suggested in Table 4, Section 9. This time, however, the analysis emerges after the user "harvests" all of the ideas from the different iteration, which generated deeper analyses. Across all of the mindsets, 70 different ideas emerged, sometimes because two or three iterations ended up producing the same mind-set, but with different words. Table 5 shows the output of this secondary analysis, after the innovation idea was given to SCAS, with the request that the idea be explained in terms of its importance, and "rated" on four different 5-point scales. In the interest of space, only 12 of the 70 ideas are shown.

Table 5 provides a resource for topic-related innovation. The table presents a new opportunity to jumpstart innovation. Of course, these ideas have to be fleshed out, tested, and applied. Accepting that means simply that there is more work to do, the price to be paid for an "innovation machine" where the ideas come out in 15 seconds, the deeper analyses come out in a half an hour.

## DISCUSSION AND CONCLUSION

The treatment and well-being of Parkinson's disease patients are influenced by their neurologist. Understanding patients' preferences and experiences helps healthcare providers to tailor treatments appropriate to the patient's needs and improve patient experience. Common factors influencing patient choice include proximity to the patient's location, specialty in movement disorders, and patient reviews. This knowledge can be used to improve marketing efforts and communication strategies for Parkinson's disease treatment. AI in the form of LLM can be used to analyze internet search patterns to understand what patients seek in a neurologist. Research on patient choice can potentially inform Parkinson's disease research and treatment, ultimately improving patient outcomes and satisfaction. AI can quickly acquire and evaluate large volumes of data, assisting researchers in finding patterns, trends, and connections that

manual analysis may miss. This capability allows LLM to guide medical professionals to "decode" patient-relevant language when the patients search for a neurologist. In turn, the neurologist can contact more prospective patients, and better tailor the Parkinson's disease therapy. By targeting patients through their preferred internet channels and resources, healthcare practitioners can build confidence and credibility with patients, improve treatment, and enhance the personal and professional interaction with patients. Finally, researchers can use LLM to synthesize mind-sets, and for each mind-set explore questions about Parkinson's disease, bringing insights and viewpoints that traditional research methods may not provide.

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