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A GUIDE TO PARKINSON'S

A General Explanation for the Curious and
the Concerned

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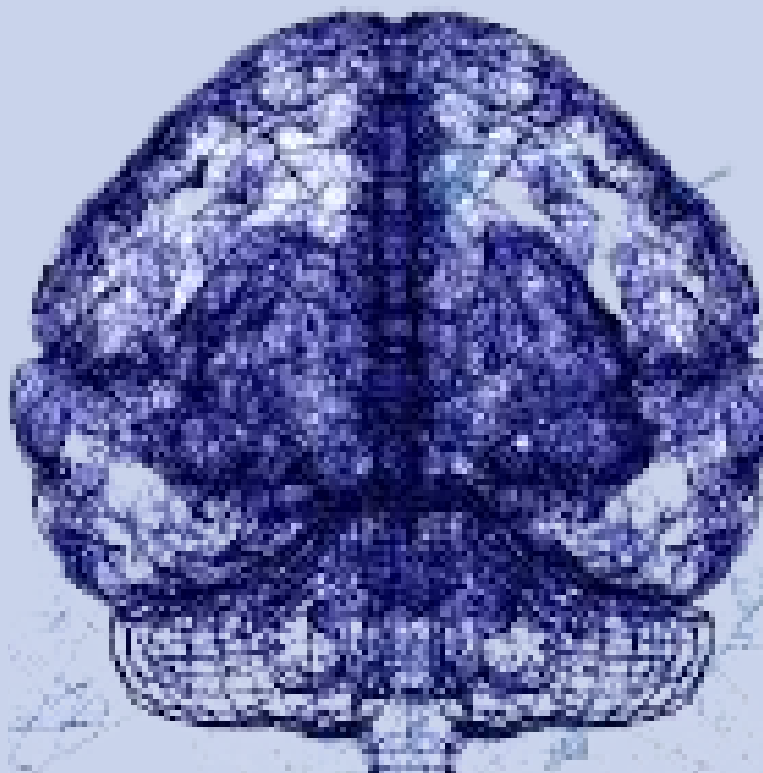
CHAPTER

WHAT IS PARKINSON'S?

A DEFINITION OF A DISEASE

Parkinson's disease is a neurodegenerative disease, meaning it is a brain condition that worsens over time. It occurs due to a person's brain cells losing their functionality or dying. Everyone's body is made up of cells, cells that perform basic functions in your body, such as allowing you to feel when something touches you, carry oxygen throughout your body (which is done by blood cells, and yes, even your blood is made of cells), and even fight infections from bacteria and viruses. When these cells die, it's not that big of a deal, since all of these cells replicate and reproduce. However, brain cells do not replicate, so when your body loses them, they are gone for good. This is what makes Parkinson's so difficult to find a true cure for, since no one can figure out how to duplicate the cells that make up your brain, to replace the function that the dead ones formerly fulfilled. Each cell in your brain has a specific function related to your thinking or control of your body, such as say moving your arm up and down. The death of these cells inhibits this function, and since brain cells don't replicate, that

function can be lost for good, as no cure exists at the moment. Parkinson's Disease comes from a death of a particular group of cells in your brain, the ones that produce dopamine. Dopamine is the chemical your brain releases in order to feel satisfaction, happiness, or pleasure. Dopamine also plays a role in controlling and regulating your movement, so a lack of it can cause a loss of one's control of their own movements. It should be noted that Parkinson's occurs primarily in the elderly, with just 4% of cases as of 2003 occurring in those under 50 years of age. It also affects around 1 million people in the U.S., with nearly 90,000 new cases every year (as of 2022).



CHAPTER 2

A BIGGER OVERVIEW OF PARKINSON'S

SYMPTOMS

The symptoms of Parkinson's and its severity may vary from person to person but they mainly come in two main categories:

MOTOR SYMPTOMS SUCH AS:

TREMORS
TENSE MOVEMENTS
UNCONTROLLED MOVEMENTS
BALANCE PROBLEMS
DELAYED/SLOW MOVEMENT

NON-MOTOR SYMPTOMS SUCH AS:

DEMENTIA
ANXIETY
LOSS OF SMELL
HALLUCINATIONS



PARKINSON'S AFFECTS MOSTLY THE NERVE CELLS IN BASAL GANGLIA, A PART OF THE BRAIN WHICH CONTROLS MOVEMENT

MOTOR SYMPTOMS

Motor symptoms refer to symptoms that impair a patient's movement, whether that be turning the pages of a book or walking across the room.

HOW EACH SYMPTOM MAY AFFECT SOMEONE

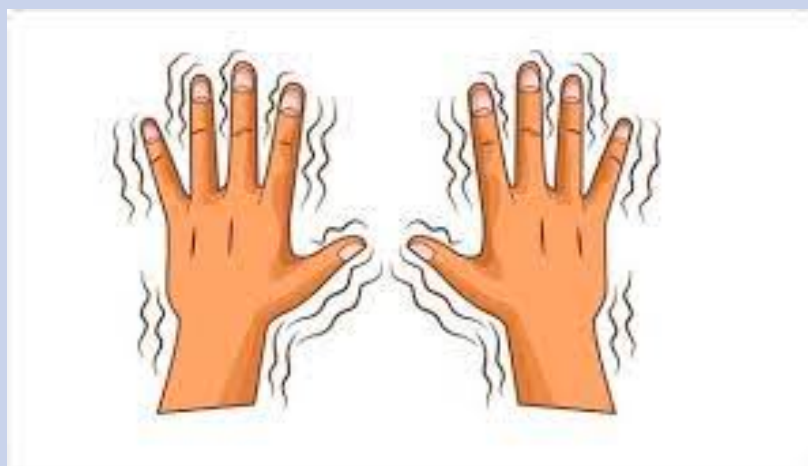
Tremors - causes patient's hands to shake randomly, which can make it difficult for them to hold things, such as a writing with a pencil, shaving with a razor, typing on a keyboard, or eating with a fork and knife.

Tense movements - can cause dull or sharp muscle pains

Uncontrolled movements - Very simply, it causes you to make sudden, unintentional movements, which can make it dangerous to handle sharp objects, objects with a lot of weight, or delicate objects.

Balance problems - can lead to patients having difficulty running, and eventually walking and even standing up.

Slow Movement - slower reaction times, which can give a patient trying to play sports or video games a difficult time



Tremor

NON-MOTOR SYMPTOMS

Dementia: As Parkinson's develops in a patient, it may affect memory/thinking. This combined with motor problems can attribute to social challenges and limited basic activities for a patient. Additionally, dementia can also affect care patients and is part of the reason for patient care stress.

Anxiety: Anxiety comes with the knowledge that Parkinson's is affecting a patient. This can be felt within the patient or close ones around them. Additionally, this can contribute to a faster development of Parkinson's disease.

Loss of smell: An early sign of Parkinson's is hyposmia which is a reduced sense of smell. This can affect a patient's enjoyment of food, appetite, and their overall quality of life.

Hallucinations: Around 20-40% of all patients experience either hallucinations or delusions. They hear or see things that are not there and the effects of these worsen as Parkinson's develops.



Anxiety

3

CHAPTER

LIVING WITH PARKINSON'S

NOW THAT YOU KNOW WHAT PARKINSON'S DISEASE IS IN A NUTSHELL, LET'S TRY TO LOOK AT HOW LIFE CAN BE WHEN YOU HAVE PARKINSON'S.

What **challenges** have you faced in managing Parkinson's disease?

Knowing that the disease I have is **inherited** and the potential that my son might have it is a big challenge for me. Also, we don't know **how the disease is progressing** or how **the symptoms I have might change**.

What helps you **coping** with the challenges of the disease?

Support of my family helps a lot. Doing **sports** like yoga and morning walks help a lot dealing with my symptoms. **Reducing stress** is another major factor that helps.

It is known that most patients experience **wide variety of symptoms**. What was the major symptom that you experienced?

My symptom was **slowness in movement** as did my father had. My first symptom was **changes in my mobility** and I was expecting the disease to show some symptoms, so I wasn't shocked.

What **advice** would you give to someone who has just been diagnosed with Parkinson's disease?

My advice would be to **stay positive** and **research** about the disease. There are multiple researches that you can learn about such as, clinical trials and ongoing lab projects. Just **be up to date** about new findings.

CHAPTER 4

TREATING PARKINSON'S

Knowing both sides of the story can help you a lot in learning about a disease that you are not so much familiar about. In the previous chapter, small excerpt from an interview done with a Parkinson's patient was presented. Now, we will be looking at how a clinician might look at the disease.



This is Dr. Elizabeth Cortez.

She worked with Parkinson's patients and patients with variety of neurodegenerative diseases for 8 years and will be talking about some of her experiences in this chapter of the book.

▶ Dr. Cortez, is there anything that you think the general audience should know about the disease?

I think that the most important thing that the general audience should know about the disease is that the lifetime of a patient with Parkinson's disease can be really challenging, it can be difficult until **lifestyle modifications**. It is difficult to say, you know, what symptom one patient may have versus another because **symptoms are unique**. Some patients can get issues with the tremor, some patients don't even have a tremor but they have difficulty with their walking or their balance or causes their blood pressure to go down. Some patients just have stiffness, so you know, there is **not a classic "every patient has this kind of look"**.

It affects nearly a million people in the United States alone, over 6 million in the world. So, you may see people in the world with this and it's **good to be aware** that it's an illness and it's not going away.

▶ **What are some challenges specific to clinicians and healthcare staff that come with treating patients with Parkinson's?**



Carbidopa-levodopa to help control the symptoms

▶ Because there is not a cure for it and they don't fully understand the cause of it, all we can do as clinicians, is **help manage the symptoms** and the quality of life for the patient. And so, a lot of the challenges are managing and trying to control the symptoms, which are commonly **tremors, stiffness, pain from the stiffness, issues with their balance and walking and falling and injuring themselves.**

But then, there are **medications** that help control the symptoms, such as **carbidopa-levodopa**, but that medication itself has its own side effects. So, a lot of times, it's hard to find that **balance** for the patient without having the side effects but also having the control of the symptoms and having the quality of life where you can do the things that you want to do and prevent injuries and prevent the progression of the disease.

▶ **Now, moving more to the clinician side of this, was there any toll on yourself and your own being during the treatment of these patients, namely psychological?**

As clinicians, you want to fix everybody, right? Somebody comes in to you and they say “I have this problem” and you want to find a solution, you want to fix it, you want them to be better and that they don’t need you anymore. Well, with Parkinson’s, **there’s not a cure**. You can’t “fix” them. You can help them, you can encourage them, you can help manage things with medications but it’s never gonna go away. One patient, in particular, that I still think about and you know, struggled with - it was kind of hard - was a really young patient.

Female patient in her twenties, and she was diagnosed with Parkinson’s in her twenties, which is **unusual** because most people are diagnosed with Parkinson’s later in life, around 50s or 60s. Typically, younger kind of can have a more manageable disease but in her case, it was very aggressive. It was really **hard to control her tremors** but she was not gonna let it beat her, you know. She got married, **she had a baby**.



Pregnancy increased tremor severity

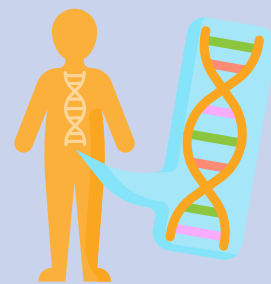
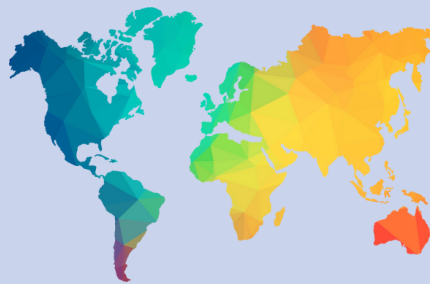
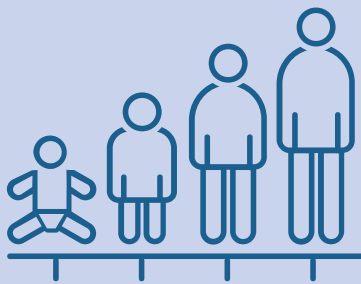
And I think the hardest time for me was right after she had the baby, and because her body changed so much after birth, her tremors were just out of control and **she was having trouble holding her baby**. She would come and cry and I felt so bad for her and you know, you want to fix it and you want to help but **maybe at that time all she needed was just someone to care and support her** through that time and help get her stabilize with her medication, just be with her throughout that process.

▶ How difficult is it to treat both the early and the late stages of Parkinson's?

So the pros of treating early stages of Parkinson's is that the earlier you intervene the easier the medications can help control the symptoms. The later you are in the disease, the **harder it is to control the symptoms**. If that makes sense. The issue is, there's **no evidence** to say that treatment early on, can slow the progression. But, it can manage the symptoms so that they have a better quality of life sooner.

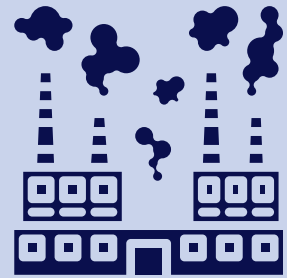
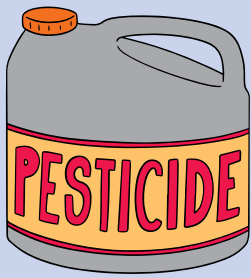
▶ Aside from funding, are there any other initiatives or policies you would like to see to help patients with Parkinson's?

There needs to be more data collected on people who have Parkinson's so you can understand the disease more. There's **not a lot of broad research being done on the ages, ethnicities, genetics**.



More research must be conducted on different ages, ethnicities, genetics

We really need that data to understand more of the pathophysiology of the condition and the progression. There needs to be more research on the **environmental aspect** too. I mean, they know the **pesticides** can play a part of it, but what about **air pollution**, what about **preservatives**, what about the **food we eat**, the **chemicals that treat our water**, everything in **the air that we're breathing?**



Different environmental factors that must be taken into account

There needs to be **more research** on that because if we identify that there are other health hazards, what else is it causing, right? And what do we need to do to counteract that from happening, to stop that, to remove whatever is out there, causing known neurological disorders? How do we prove that needs to go away? And then finally, I think there needs to be **more research freedom**. There needs to be more access to exploring science in different ways, thinking outside the box, to help find solutions because you're going to need to be creative. You need to expand the process because what they have been trying to do may help but it is not fixing it.



I have one more question. Why do you think Parkinson's rates are higher in the US compared to the rest of the world?



Importance of diet

I think that's a good question. I've heard some discussions about **how the US eats a lot of packaged foods**, processed foods. Some countries are very very focused on **eating clean** and not eating anything that's been packaged. Only eat things that are fresh from the market, fruits and vegetables, clean meats and things like that.







So I think **our diet plays a part** in it as an environmental part and I think the pesticides part, also.


There are many countries that regulate that a lot more carefully than the US. Also, **the quality of the air** is a big part, the pollution because we have so many factories, so many cars, so much emission. It's probably, may not be regulated as much as it should be. **It could be a multitude of things, I think that's the hot conversations right now, in that sphere.** That's a great question though.

▶ **Thanks a lot for interviewing with us, Dr. Cortez.**

Yeah, it was my pleasure. Thank you for having me. ◀

Parkinson's Disease
Lifestyle modifications for Parkinson's disease

-  **Manage stress**
-  **Get adequate rest**
-  **Exercise regularly**
-  **Maintain a healthy diet**

#becauseyourhealthmatters 

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CHAPTER

TREATMENT OPTIONS

FOCUSED ULTRASOUND ABLATION (FUSA)

FUSA a remarkable medical advancement that can help improve the lives of people facing Parkinson's disease. FUSA is a special treatment that doesn't involve any surgery or cuts, making it gentle and easy on the body.

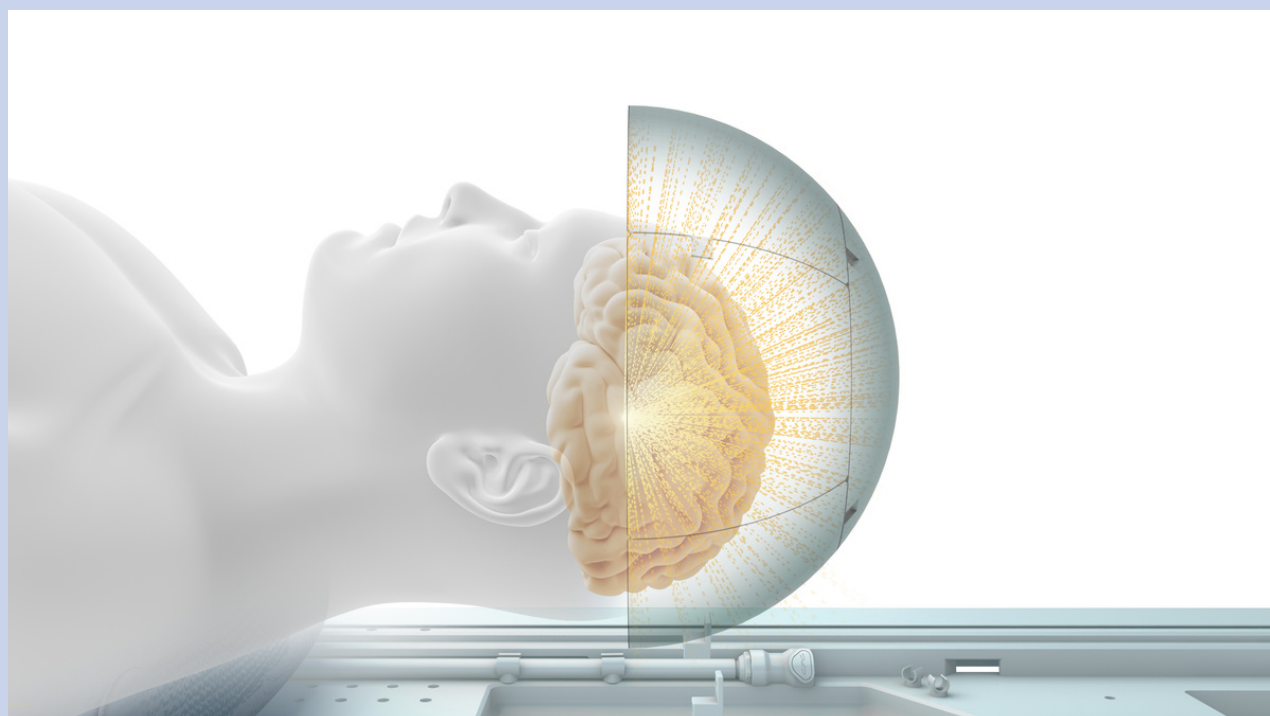
FUSA uses special sound waves to gently warm specific parts of the brain that need treatment. First, doctors try it out on a restricted area to see how the body responds. If everything goes well, they then use it to treat the problematic areas more permanently. The best part is, during the whole process, you can stay awake and be comfortable without feeling any pain!

FUSA is different from the traditional methods like surgery. It causes minimal damage to surrounding tissues, making it safer and more appealing to many people.

But like everything, FUSA has some downsides too. Some people might experience sensory and gait disturbances, dizziness, or headaches after the procedure. Although these side effects are usually not permanent, there's a slight chance of strokes, seizures, or infections, though they're very rare.

FUSA has shown exciting results so far, but more research is needed to fully understand how effective and safe it is. Even though it might not be perfect, FUSA opens up new possibilities for better healthcare without the need for surgery.

We hope this introduction helps you understand Focused Ultrasound Ablation better. If you want to know more, check out our brochure to explore this amazing technology that could change lives for the better!



MONOAMINE OXIDASE-B INHIBITION

Monoamine oxidase-B (MAO-B) inhibition is a treatment option commonly used for managing Parkinson's. In the brain, there is an enzyme called MAO-B that breaks down dopamine, which is a crucial neurotransmitter involved in controlling movement. In Parkinson's, the levels of dopamine are low, leading to motor difficulties.

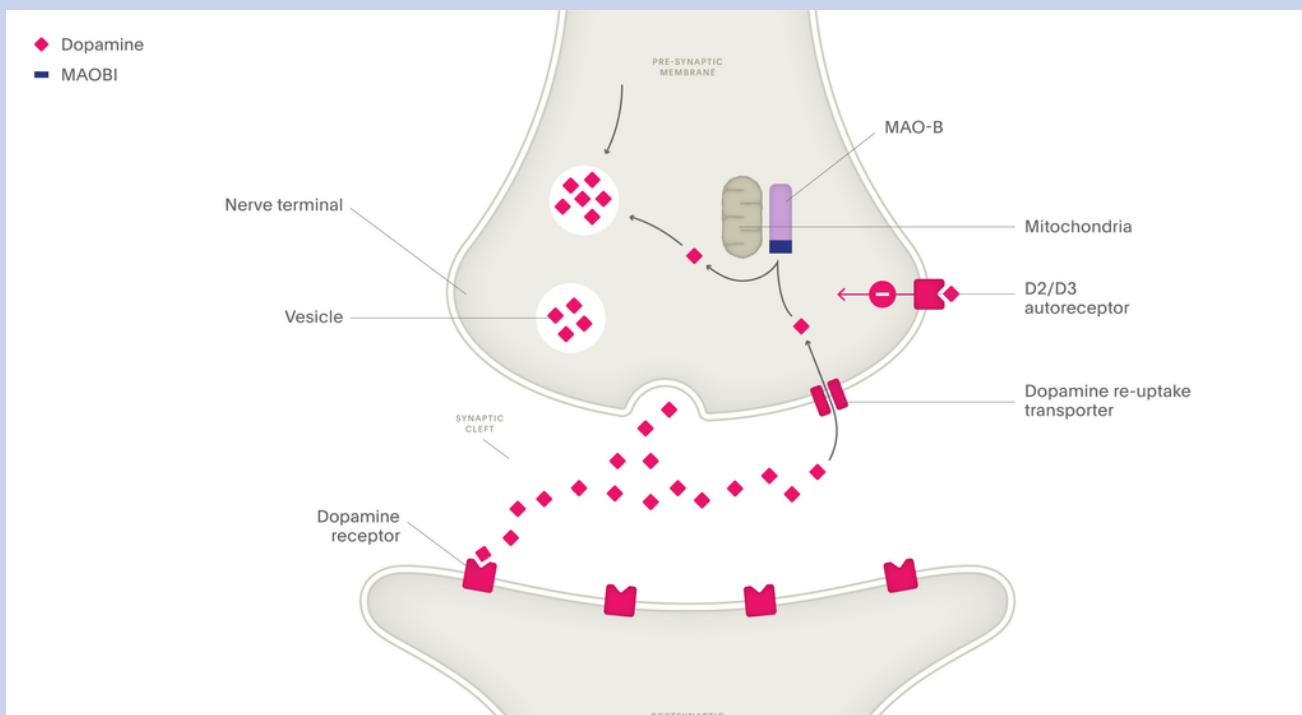
MAO-B inhibitors work by blocking the actions of the MAO-B enzyme, which helps prevent the breakdown of dopamine. By doing so, these inhibitors increase dopamine levels in the brain, which can reduce the symptoms of the disease.

The two primary MAO-B inhibitors used for Parkinson's treatment are selegiline and rasagiline. Selegiline is available in both tablet and patch form for skin application, while rasagiline is solely available as a tablet.

One of the significant advantages of MAO-B inhibitors is that they are generally well-tolerated by older individuals. Common side effects include dry mouth, dizziness, and constipation.

Additionally, it is crucial to be aware that MAO-B inhibitors can interact with other medications, necessitating a discussion with your doctor before starting this treatment.

While MAO-B inhibitors do not offer a cure for Parkinson's disease, they can effectively improve symptoms. They are usually used with other treatments to help individuals with Parkinson's to have more active and independent lives.



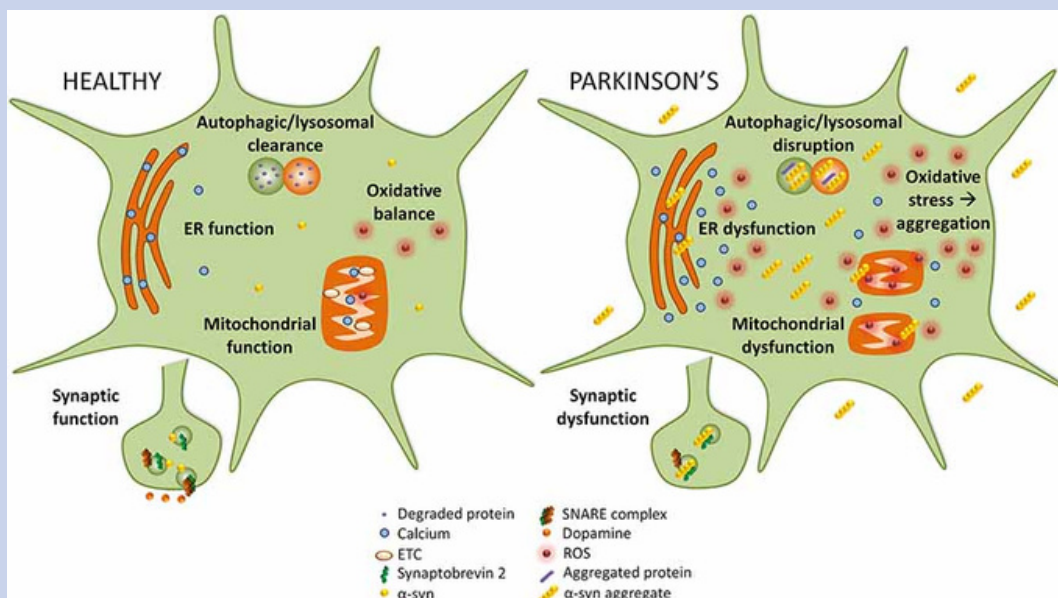
(How will MAO-B inhibitors function?)

TARGETING α -SYNUCLEIN WITH PROTEASES

A protein called α -synuclein plays a role in increased disease's progression of Parkinson's patients. Scientists are investigating innovative ways to reduce the levels of this protein to alleviate symptoms.

One approach being studied involves using special enzymes called proteases. These proteases act like tiny "scissors" that can break down α -synuclein. By carefully controlling these enzymes, researchers hope to decrease the harmful effects of the protein while preserving its essential functions in the brain.

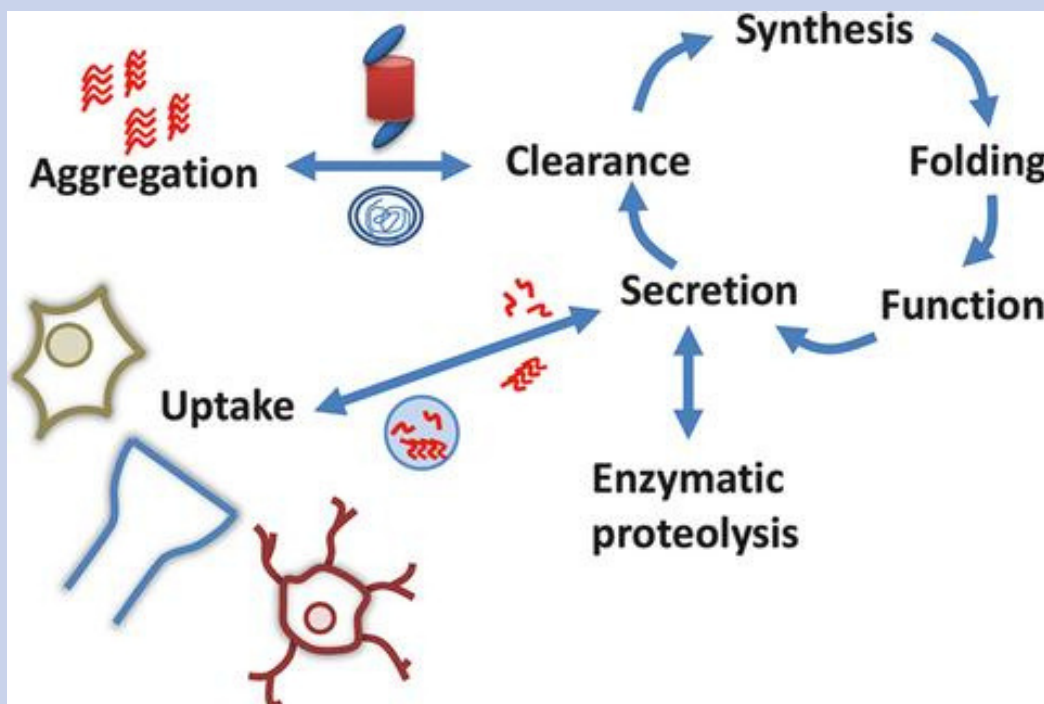
However, it's important to proceed with caution. The brain is a complex system, and changes to certain proteins can have unintended consequences. Scientists are working diligently to find the right balance and dosage to minimize any side effects.



(Aggregation of α -synuclein)

Additionally, they're considering the normal levels of α -synuclein that are necessary for maintaining healthy brain function. It's a sensitive balancing act, and researchers are striving to understand all the factors involved.

Our journey towards effective treatments for Parkinson's disease continues. Through scientific exploration, we move closer to finding therapies that can truly make a difference in the lives of those living with this condition.

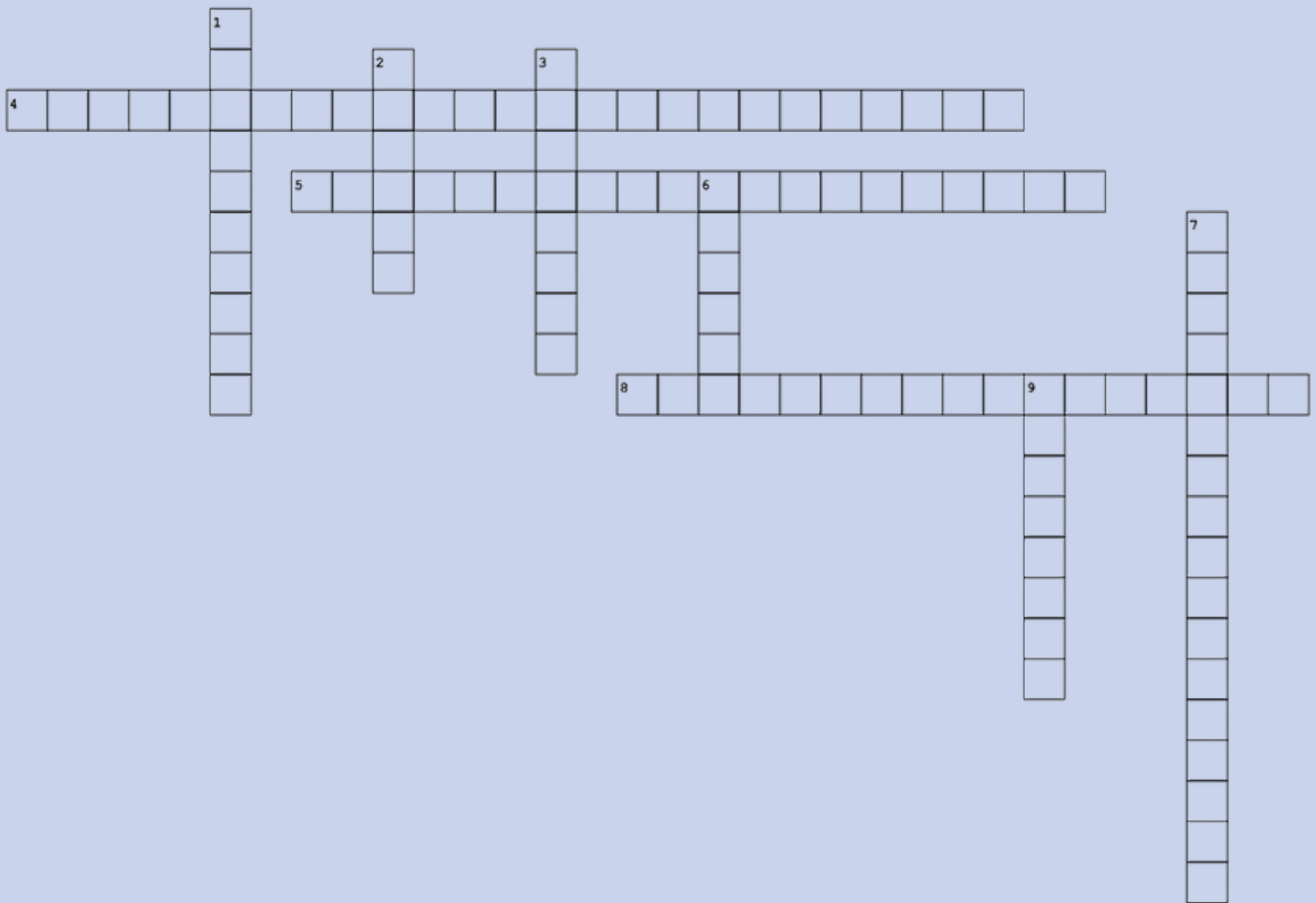


(Where will proteases function?)

CHAPTER 6

EXTRA: CROSSWORD PUZZLE

Parkinson's Crossword Puzzle



Across

- 4) A treatment for Parkinson's that uses lasers
- 5) One of the treatments for Parkinson's, only 15% of the patients qualify to get it
- 8) The most commonly used medication for Parkinson's

Down

- 1) The number of people in the US that have Parkinson's
- 2) Increases disease progression and symptom severity
- 3) The neurotransmitter that is absent in Parkinson's
- 6) One of the most common symptoms of Parkinson's
- 7) The kinds of brain disease Parkinson's is
- 9) Makes managing the symptoms easier



For any questions you have, you can always reach out to us from:

Telephone: +1XXXXXXXXXXXX
eMail: xxx@gmail.com

And if you have any of the symptoms or any concerns that you might have Parkinson's, we advise you to consult your doctor.