

MitoInsights

Bringing mitochondrial science closer to the people it matters to most

Science moves fastest when everyone can take part. That's why MitoCanada is committed to empowering our community with knowledge. By translating cutting-edge mitochondrial research into clear, easy-to-understand summaries, we aim to nurture curiosity, strengthen understanding, and build confidence in the science driving hope and progress.

Lay Summary: Population-Based Study of Mitochondrial Disease and Mental Health Conditions in Ontario, Canada

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What's this research about?

This ground-breaking study explored how often mental health conditions, such as anxiety, depression, and substance use disorders, occur among people living with mitochondrial disease in Ontario, Canada. It also looked at how these mental health conditions affect hospital visits, healthcare use, and the overall cost of care.

To help interpret the results, the researchers compared the mitochondrial disease group with another chronic neurological condition, multiple sclerosis (MS), which is known to have high healthcare needs and is often associated with mental health challenges.

In this study, led by Dr. Laura C. Rosella, Dr. Ana C. Andreazza, and Dr. L. Trevor Young, researchers used population-wide health data from Ontario to reveal that people living with mitochondrial disease experience significantly higher rates of mental health conditions and healthcare use, highlighting the need for more integrated physical and mental health care.

Why is this important?

Until now, there has been very little data on how mitochondrial disease and mental health intersect on a large scale. While individual studies and patient experiences have shown that mitochondrial dysfunction can affect the brain and contribute to mental health challenges, population-wide research hadn't been done.

Understanding these patterns is crucial for improving care. People with mitochondrial disease often face complex health challenges, and if mental health concerns are common and overlooked, patients may experience worse health outcomes and greater barriers to care. This research helps healthcare systems recognize those needs so they can offer more holistic, compassionate, and effective support.

How did they study this?

The research team used Ontario's provincial healthcare databases, which record information from hospitals, emergency departments, and physician visits.

They identified **1,495 people** who had been hospitalized at least once for mitochondrial disease between 2005 and 2019. For comparison, they also studied **8,482 people** hospitalized for multiple sclerosis during the same period.

By securely linking health data across different sources, the researchers were able to see:

- Whether a person had been treated for a mental health condition within the three years before their mitochondrial diagnosis
- How often patients visited hospitals, emergency departments, or doctors
- How much their healthcare cost before and after their diagnosis

This approach allowed the researchers to see big-picture trends across the entire province, rather than relying on individual clinics or small samples.

What did they find?

The results were striking. People living with mitochondrial disease were twice as likely to have a mental health condition as those with MS:

- 18% of the mitochondrial group had a mental health condition
- 9% of the MS group did

Among mitochondrial patients, the most common mental health challenges were:

- Substance-related disorders (52%)
- Mood or affective disorders, such as depression or bipolar disorder (32%)
- Anxiety and adjustment disorders (29%)

Healthcare use was also much higher for people with both mitochondrial disease and mental illness. Nearly **half (49%)** of these patients were hospitalized within one year, compared to only **12%** of MS patients without a mental health condition.

Costs told a similar story. Mitochondrial disease patients with mental health conditions had the highest healthcare costs of all groups, both before and after their diagnosis, showing just how significant the burden of care can be for these individuals and families.

What does this mean for mitochondrial disease research?

This is the **first-ever population-wide study** to confirm that mental health conditions are common and impactful among people with mitochondrial disease.

The findings highlight that mental health and mitochondrial health are deeply connected. This connection likely reflects how mitochondrial dysfunction in brain cells can affect neurotransmitters, chemicals that regulate mood, energy, and cognition.

For researchers and clinicians, this study emphasizes the urgent need for:

- **Integrated care** that addresses both physical and mental health
- **Better screening and support** for depression, anxiety, and substance use
- **More awareness and training** for healthcare providers so they can recognize and treat these issues early

For the mitoCommunity, it validates what many families have long known, that the emotional and psychological toll of mitochondrial disease deserves the same attention and resources as the physical symptoms.

The research in simple terms

This study shows that people with mitochondrial disease are more likely to experience mental health conditions and that these challenges lead to higher hospital use and medical costs. It paints a clearer picture of how big the problem is and helps make the case for more comprehensive care and support.

Why this matters to the mito community

This research is a powerful step forward in recognizing the whole person behind the diagnosis. It tells healthcare systems, and the world, that mitochondrial disease affects not just muscles and organs, but also mental health and emotional wellbeing.

For patients and caregivers, it reinforces that mental health challenges are common and deserve compassion, understanding, and access to care. For advocates, it provides valuable data to push for better mental health services and integrated supports for mito families.

Acknowledgment

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