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## From the Editor

Plans are well under way for this year's workshop. It is unfolding to be even bigger and more exciting than ever! A full brochure with all the event details will be mailed out in the next few weeks. We hope to see you there!

Please continue to send your contributions, ideas and stories for the newsletter, as well as topic ideas for the Metabolic Family Workshop to [janice.little@lhsc.on.ca](mailto:janice.little@lhsc.on.ca)

Janice Little

## From Dr Chitra Prasad

Dear Friends,

A very Happy New Year! Here is hoping 2017 will bring happiness, contentment, good health and peace to you and your family. We have had lot of changes in the metabolic clinic. Sue Maclean has joined us as the new social worker. Samantha Colaiacovo is the genetic counsellor covering maternity leave of Melanie Napier. Thanks Sue and Samantha. We will be having the metabolic family workshop on May 12th 2017 and low protein cooking demonstration on May 13th 2017. While low protein cooking demonstration will be held every year, the metabolic family workshop will be organized once every two years. I hope to see many of you at these educational events this year. Both events are offered free of cost. They are great opportunities for families to meet other families and professionals.

We have a very insightful article written by Heather Aitken for the current newsletter. When I think of Heather, I am reminded of immense courage. Heather has a very rare mitochondrial disorder MNGIE mitochondrial neurogastrointestinal encephalopathy disease. Heather has shown by her positive attitude that it is possible to contribute to family and society even in the face of total uncertainty. She has also brought the important topic of ongoing spiritual care when we are dealing with very rare disorders with no definitive treatments. I invite you to read her story and other such accomplishments in this newsletter. I am also pleased to inform everyone that there is now interest in mitochondrial disorders clinical research. Dr. Beth Potter's group from CHEO has joined the Mito Canada and is initiating surveys on mitochondrial disease management. Finally thank you all so much for sharing your emails. We are sending many more newsletters on email now!

With very best wishes

Your Friend  
Chitra Prasad

*"Anyone can give up; it is the easiest thing in the world to do. But to hold it together when everyone would expect you to fall apart, now that is true strength."*

Chris Bradford

## Personal Stories

### Living with MITO

By Heather Aitken



Procrastinating is a pet peeve of mine. I'm usually ahead of the game, early to appointments and fairly organized. However, this piece of writing has been on the back burner for several weeks, maybe months. I'm not sure how much I understand of my own self, so to put it to paper has been a struggle. My journey began in the early morning hours on March 9, 2008. I woke up just after 3am with excruciating pain in my head; a headache unlike I'd never had before. I spent the day in bed. The week that followed was dreadful. I worked with head pains continuing, as well as dizziness, nausea, and fatigue and

vomiting. My boss's wife ordered me to emerge the following Monday morning. I couldn't go to the hospital for a headache, could I? I went. And I felt silly. That was my last day of work. The headache and its effects continued for days, and into weeks. My family doctor was puzzled and concerned. I slept through a lot of the pain for the next months that followed. I couldn't function normally. In between resting and sleeping, I had appointments of blood work, CT scans, physical assessments and 2 MRI's. I met with a doctor in Kitchener who specializes in Multiple Sclerosis. She clearly and confidently ruled out that diagnosis. My files were sent onto London Health Sciences Centre, which is where I met with Dr. Chitra Prasad. I'll never forget my first meeting with her. It was in the children's ward and the room was decorated as such. It was bright and cute; but I was scared. My dad accompanied to the appointment and was my designated driver to many of my appointments. My initial meeting with Dr. Chitra was intense, all kinds of testing – visual, muscular, memory and more blood tests. Several months passed and I still had pains in my head. The lights were bright and noises were loud. My energy drained and I got exhausted easily. I escaped to my bed to sleep, sometimes napping twice a day and early to bed at night. With the headaches and nausea came more vomiting. The pounds were falling off; especially in areas where I wasn't pleased. I had never been overweight, but suddenly I'd lost 15 pounds in a matter of weeks. I visited our local emergency department frequently for pain relief and hydration. My B12 injections went from monthly to weekly. I spent a full year depending on Demerol shots just to function through the day and ease pain. My jar seemed half empty as the saying goes. My son was in his teens; busy with his social life, school and baseball, hockey and bull riding. We tried to be a normal family. Other members of my family checked in but I became frustrated with telling them that I had a headache again. Today, I know Colton worries about my health and struggles with vocalizing his thoughts on it. He is now 18 and this summer ventured to Alberta to partake in harvest on the prairies. And now? Well, he's in Australia to experience the farm life and harvest down under. I encourage him to live his life to its fullest potential; after all, you never know what's ahead.

## Personal Stories - continued

Stuart was trying his best to cover and take on extra duties. My friends and neighbours stopped by occasionally. My social life soon began to deteriorate as I slept away hours of my day. I couldn't keep up. I was losing. There's no way anyone could understand the frustrations I had. This couldn't be happening to me. Why me? Why now? So many unanswered questions!

In the spring of 2010, my dad became ill with cancer and my mom suffered a broken ankle. That's when I stepped up. I became their caregiver. I felt useful and needed. The headaches were continuing, as were the follow up appointments with our family doctor and in London. We lost my dad in July of 2010. I was broken. And then in December of the same year, my diagnosis came through. MNGIE –.

When Stuart and I heard the words and the explanation coming from Dr. Prasad about the disease, I was in a fog. She said 'no cure' – what? Are you serious? I am a mom. I'm 40 years old. And now you're telling me it's a rare disease and there's no cure? It certainly had never occurred to me that I'd wake up sick one day and never get better. Again, I asked 'why me?'

Since the diagnosis I have met with several specialists, had blood drawn a hundred times, been pulled, prodded and poked, listened to dieticians, had nerve testing done and still continue to be monitored by my team of doctors. I'm thankful for every caregiver I've met. Our town of approximately 3000 is in a rural area where everyone seems to know your business. My family health team is phenomenal though with caring for my needs.

I'm not looking for sympathy or pity. I am hoping to raise awareness for rare diseases and in particular, Mito. Everyone knows about Heart and Stroke and Cancer, but who hears about Mitochondrial disease?

My most recent conundrum involved stomach cramping and the bumps that sometimes protrude out. The pain can be pretty intense and last anywhere from a few minutes to 30 minutes. Sometimes there's just one, sometimes more. Tests ruled out gall bladder at our local hospital. I mentioned it and showed pictures on my next appointment with Dr. Prasad. It's another side effect of MNGIE, that I wasn't prepared for. Wonderful! The muscles in my stomach contract and cause the pain. So when I mentioned the leg pains that I'd also experienced, sure enough, all part of her expectations.

I have also become a believer in essential oils. I diffuse a variety throughout the house, day and night. Is it a coincidence that I've been 'headache and vomit' free for that entire time? I'm not about to run out of oils just in case. I know the oils can't cure me, but if they help with my symptoms, I'm going to continue!

I've learned to deal with the headaches and know when to get to emergency department.

To describe how I feel? Exhausted, angry, crabby, anxious, overwhelmed, confused, lazy, lonely, sad, scared, frustrated and annoyed. I returned to church a few months ago and prayer seems to help some of my feelings to be released.

My mantra is to BELIEVE – I buy artwork, frames and décor if it has that special word. I even got a tattoo on my wrist with the green Mito ribbon and the word Believe.

## Personal Stories - continued

My strength varies from day to day. That includes physical, emotional and mental. Some days I feel great and others, not so much, making it hard to plan ahead. I live everyday the best I can. I rest when I'm tired, try to stay hydrated, eat all day long and watch my blood pressure. Recently, anxiety has become my nightmare. This has affected my sleep and rest. My brain gets busy especially at night. I've begun an anxiety and depression medication, which will eventually help. For now, sleeping pills are working wonders. Funny how someone so tired, can't sleep! Often we hear about depression and anxiety in the news. I never thought it would affect me. Brains aren't controlled with an off/on switch. I can't just 'forget about it' or 'deal with it later' – thankfully my family doctor is very understanding. According to Stu, some days are just 'moodier' than others. Apparently, my meds are not working to their potential yet...

MNGIE affects so many parts of me. I'm not sure how many more surprises there will be, but I pray that strength will persevere. I have many things to be thankful for. My family is first. I babysit a few hours a week and enjoy going to our local rink to watch hockey. My son is a tough young man who travels between Alberta and Australia to farm and harvest. Stu is becoming a good masseuse and rubs my legs, even at 2am. If anyone sees firsthand the struggles I have, it's him. The pains, the discomforts and moods are real. My mom is always just a call away, great support and provides us with delicious treats too. She has also accompanied me to some appointments. Mom also checks in with texts and visits. I happen to be an only child, so call it spoiled if you want, but my mom is the best. Kibbles is my sweet cuddly dog and always knows when I'm under the weather.

I will never understand the scientific A, B, C's of MNGIE and I am not sure I really want to. I can't change it. My last visit with Dr. Chitra included a conversation about stem cell transplant. I'd be taking the guinea pig approach. There's so much unknown. So, for now, it's on the back burner. Of course, I worry about the future, but it's not mine to control. I love every single day to the best I can. Obviously some days are better than others. I am scared of the statistics and research – so while I can turn a blind eye, I will.

So here's to living. Living with Mito.

I have a Mito disease, but it doesn't have me.



Heather and her son Colton

## Featured This Issue

### MNGIE (Mitochondrial Neurogastrointestinal Encephalopathy)

Compiled by Dr. Chitra Prasad MD FRCPC FCCMG

Mitochondrial neurogastrointestinal encephalopathy (MNGIE) disease is a condition that affects several parts of the body, particularly the digestive system and nervous system. The major features of MNGIE disease can appear anytime from infancy to adulthood, but signs and symptoms most often begin by age 20. The medical problems associated with this disorder worsen with time. Abnormalities of the digestive system are among the most common and severe features of MNGIE disease. Almost all affected people have a condition known as gastrointestinal dysmotility, in which the muscles and nerves of the digestive system do not move food through the digestive tract efficiently. The resulting digestive problems include feelings of fullness (satiety) after eating only a small amount, trouble swallowing (dysphagia), nausea and vomiting after eating, episodes of abdominal pain, diarrhea, and intestinal blockage. These gastrointestinal problems lead to extreme weight loss and reduced muscle mass (cachexia).

MNGIE disease is also characterized by abnormalities of the nervous system, although these tend to be milder than the gastrointestinal problems. Affected individuals experience tingling, numbness, and weakness in their limbs (peripheral neuropathy), particularly in the hands and feet. Additional neurological signs and symptoms can include droopy eyelids (ptosis), weakness of the muscles that control eye movement (ophthalmoplegia), and hearing loss. Leukoencephalopathy, which is the deterioration of a type of brain tissue known as white matter, is a hallmark of MNGIE disease. These changes in the brain can be seen with magnetic resonance imaging (MRI), though they usually do not cause symptoms in people with this disorder.

This condition is inherited in an autosomal recessive pattern, which means both copies of the *TYMP* gene in each cell have mutations. The parents of an individual with an autosomal recessive condition each carry one copy of the mutated gene, but they typically do not show signs and symptoms of the condition. Mutations in the *TYMP* gene (previously known as *ECGF1*) cause MNGIE disease. This gene provides instructions for making an enzyme called thymidine phosphorylase. Thymidine is a molecule known as a nucleoside, which (after a chemical modification) is used as a building block of DNA. Thymidine phosphorylase breaks down thymidine into smaller molecules, which helps regulate the level of nucleosides in cells.

*TYMP* mutations greatly reduce or eliminate the activity of thymidine phosphorylase. A shortage of this enzyme allows thymidine to build up to very high levels in the body. Researchers believe that an excess of this molecule is damaging to a particular kind of DNA known as mitochondrial DNA or mtDNA. Mitochondria are structures within cells that convert the energy from food into a form that cells can use. Although most DNA is packaged in chromosomes within the nucleus, mitochondria also have a small amount of their own DNA.

*Treatment of manifestations:* Management is primarily supportive and includes attention to swallowing difficulties and airway protection; dromperidone for nausea and vomiting; gastrostomy, and parenteral feeding for nutritional support; antibiotics for intestinal bacterial overgrowth; amitriptyline, nortriptyline, and gabapentin for neuropathic symptoms; specialized schooling arrangements; and physical and occupational therapy.

*Prevention of secondary complications:* Attention to swallowing abnormalities and diverticulosis, respectively, may help prevent aspiration pneumonia and ruptured diverticula.

*Agents/circumstances to avoid:* Drugs that interfere with mitochondrial function should be avoided; medications primarily metabolized in the liver should be used with caution.

*Therapies under investigation* include allogeneic stem cell transplantation (AHSCT).

#### References:

<https://ghr.nlm.nih.gov/condition/mitochondrial-neurogastrointestinal-encephalopathy-disease>

(Genetics Home Reference)

<https://www.ncbi.nlm.nih.gov/books/NBK1179/> (Gene Reviews)



## Suzanne's Corner



This recipe is from Genevieve Lafrance's website:  
[www.lowprorecipes.com](http://www.lowprorecipes.com).

Genevieve will be speaking at the 12th Metabolic Family Workshop on May 12th: PKU breakout group on "The basics of low protein cooking: tips to be successful"

### Yield

Number of servings: 2

Serving size: 1/2 of the recipe



### Ingredients

- 2 tortillas from Cambrooke foods (2118) or homemade
- 1 Tbsp (15 ml) Daiya plain cream cheese
- 2 Tbsp (30 ml) Miracle Whip salad dressing
- 2 Tbsp (30 ml) salsa
- ¼ cup (60 ml) mashed avocado
- 2 Tbsp (30 ml) grated low protein cheddar cheese from Cambrooke foods (2314)
- 1 Tbsp (15 ml) red pepper, in small cubes
- 1 Tbsp (15 ml) thinly sliced green onion
- 1 Tbsp (15 ml) fresh chopped cilantro

### Preparation

- Cut tortillas into 6-8 wedges. Place on a baking sheet.
- Bake at 400 F for about 15 minutes. Turn half-way through cooking.
- In a small bowl, whisk together cream cheese and salad dressing. Mix well. Spread in the bottom of a plate or in a small ramekin.
- Over the cheese mixture, add the salsa.
- Over the salsa, add avocado.
- Over avocado, add the grated cheese, then red pepper, green onion and cilantro.
- Serve with tortilla chips.

### Nutritional facts

Serving	Recipe
Energy	328 kcal
Protein	1.5 g
PHE	68 mg
TYR	41 mg
LEU	98 mg
VAL	86 mg
ILE	57 mg
MET	23 mg
LYS	73 mg

# Metabolic Family Workshop

Friday, May 12, 2017

Best Western Lamplighter  
591 Wellington Road London, ON



# Low Protein Cooking Demonstration

Saturday, May 13, 2017

Real Canadian Superstore  
825 Oxford Street E London, ON

***For further information, contact Janice Little at 519-685-8453***

## What's New

### New Staff Members



Hello! My name is Samantha and I'm a graduate of Sarah Lawrence College's MS genetic counselling program in New York. While I enjoyed my time exploring parts of the "Big Apple" for the past two years, I am happy to be back closer to home! Prior to genetic counselling, I completed a BSc in Biology and Psychology at the University of Waterloo. I'm excited to meet and get to know everyone over the next year and be part of the Metabolics team.

Sam

Welcome to Sue MacLean, the new metabolic clinic social worker. MSW, RSW  
Hi Everyone! I look forward to new beginnings, new learnings with patients and their families and working with a cohesive and supportive team! I feel fortunate to have worked in Paediatrics within London Health Sciences Centre for the past 22 years. With respect to my education, I received my Bachelor of Arts degree in Psychology at Mount Allison University (NB) in 1985. Went on to acquire a Bachelor of Social Work degree from Saint Thomas University (NB) in 1991. I did a Masters of Social Work degree at the University of Toronto, graduating in 1994.



Amidst my years of schooling, I worked for the Children's Aid Society, Kinark Child and Family Mental Health Services, and Youth Corrections.

I hail originally from the East Coast of Canada. Prince Edward Island is my escape! Outside of work, three teens keep me busy and always learning. When I have "me time" you can find me enjoying my horse.

## Our Stars



**Joan and Christine**

Glycogen Storage Disease type-a



**Joan, Christine and family  
on vacation in Korea**



# The Inherited Metabolic Disorders News

## Our Stars

### Reese

Vanishing White Matter Disease

Written by Elena Thompson For Reese Thompson

(Diagnosis)

On September 25, 2015 we held a "Believe in Reese" BBQ and silent auction! It was a success we raised just over \$4500.00. We are so thankful we have such a great community and have so many thoughtful business owners who gave us so many great donations for the silent auction. we also had a special guest Queen Elsa from frozen came to surprise Reese. The dress Reese wore that day was designed by Reese and was made by Nicole from the Abby Fund. We sent all the money raised to AFTAU (American friends of Tel Aviv university) since there is no funding or research for this rare disease in Canada. Reese was diagnosed at the age of 3 and is now 8 so we are in a race against time and it breaks our hearts every time we have to think about it. For further information please check the webpage. <https://www.gofundme.com/believeinreese>.



### McKeown Family



#### Trip to Disneyworld

We had such a great trip and lots of great memories. We never could have done Disneyworld without the special treatment we received through "Children's Wish" (like not waiting in lines). The boys' favourite ride was Space Mountain.

Again thanks for caring for our boys and family.

Sharlene McKeown

## Our Stars - continued

### Jasper

MPS VI

Jasper is holding the trophy that his ball team won this year at their year-end tournament. He enjoyed another season of ball and is getting set for another year of hockey! We're trying to keep him as active as possible to help fight off the bone and joint stiffness. So far it seems to be working because he's not showing any signs of slowing down!



**Jasper the goalie**



## Research / Publications

1. 2015 - present Srinitya Gannavarapua, Identifying the genetic and biochemical markers associated with an unidentified white matter disease: Case study (in process), Western University, Schulich School of Medicine & Dentistry, Department of Paediatrics, Genetics, Co-Supervisor / Principal Investigator
2. 2015 - present Ravi Datar, The application of magnetic resonance imaging algorithms in the clinical diagnosis of white matter abnormalities at neurometabolic/neurogenetic/metabolic/neurology clinics (London Health Sciences Centre) 2004-2015 (in process), Western University, Schulich School of Medicine & Dentistry, Department of Paediatrics, Genetics, Supervisor/Principal Investigator
3. 2016 Siddiq S, Wilson BJ, Graham ID, Lamoureux M, Khangura SD, Tingley K, Tessier L, Chakraborty P, Coyle D, Dyack S, Gillis J, Greenberg C, Hayeems RZ, Jain-Ghai S, Kronick JB, Laberge AM, Little J, Mitchell JJ, Prasad C, Siriwardena K, Sparkes R, Speechley KN, Stockler S, Trakadis Y, Wafa S, Walia J, Wilson K, Yuskiv N, Potter BK; Experiences of caregivers of children with inherited metabolic diseases: a qualitative study. Canadian Inherited Metabolic Diseases Research Network (CIMDRN). Orphanet J Rare Dis. 2016 Dec 7;11(1):168. PMID: 27927250
4. 2016 Mirzaa G, Timms AE, Conti V, Boyle EA, Girisha KM, Martin B, Kircher M, Olds C, Juusola J, Collins S, Park K, Carter M, Glass I, Krägeloh-Mann I, Chitayat D, Parikh AS, Bradshaw R, Torti E, Braddock S, Burke L, Ghedia S, Stephan M, Stewart F, Prasad C, Napier M, Saitta S, Straussberg R, Gabbett M, O'Connor BC, Keegan CE, Yin LJ, Lai AH, Martin N, McKinnon M, Addor MC, Boccuto L, Schwartz CE, Lanoel A, Conway RL, Devriendt K, Tatton-Brown K, Pierpont ME, Painter M, Worgan L, Reggin J, Hennekam R, Tsuchiya K, Pritchard CC, Aracena M, Gripp KW, Cordisco M, Esch HV, Garavelli L, Curry C, Goriely A, Kayserilli H, Shendure J, Graham J Jr, Guerrini R, Dobyns WB. PIK3CA-associated developmental disorders exhibit distinct classes of mutations with variable expression and tissue distribution. JCI Insight. 2016 Jun 16;1(9). pii: e87623. PMID: 27631024
5. 2016 Prasad C, Napier MP, Rupar CA, Prasad C. Fumarase deficiency: a rare disorder on the crossroads of clinical and metabolic genetics, neurology and cancer. Clin Dysmorphol. 2016 Aug 18. [Epub ahead of print] No abstract available. PMID: 27541980
6. 2016 Response to: Letter to the Editor Regarding: The Expanding Phenotype of MELAS Caused by the m.3291 T > C tRNA Mutation E Kelland, C. A. Rupar, Asuri N. Prasad, K. Y. Tay, A. Downie and C. Prasad (1) by Josef Finsterer, MD, PhD [1], Sinda Zarrouk-Mahjoub, PhD [2] [1] Krankenhaus Rudolfstiftung, Vienna [2] Genomics Platform, Pasteur Institute of Tunis, Tunisia. Kelland E, Rupar CA, Prasad AN, Tay KY, Downie A, Prasad C. Mol Genet Metab Rep. 2016 Jul 15;8:41-2. doi:10.1016/j.ymgmr.2016.07.002. No abstract available. PMID: 27493879
7. 2016 Lowther C, Speevak M, Armour CM, Goh ES, Graham GE, Li C, Zeesman S, Nowaczyk MJ, Schultz LA, Morra A, Nicolson R, Bikangaga P, Samdup D, Zaazou M, Boyd K, Jung JH, Siu V, Rajguru M, Goobie S, Tarnopolsky MA, Prasad C, Dick PT, Hussain AS, Walinga M, Reijenga RG, Gazzellone M, Lionel AC, Marshall CR, Scherer SW, Stavropoulos DJ, McCready E, Bassett AS. Molecular characterization of NRXN1 deletions from 19,263 clinical microarray cases identifies exons important for neurodevelopmental disease expression. Genet Med. 2016 May 19. doi: 10.1038/gim.2016.54. [Epub ahead of print] PMID: 27195815
8. Dec 22nd 2016. Talk on Approach to clinical exome sequencing using case based scenarios. Presented to Department of Paediatric, Genetics and Paediatric neurology All India Institute of Medical Sciences New Delhi India by Chitra Prasad

## How to Be Happy

### Simple Ways to Build Your Confidence and Resilience to Become a Happier, Healthier You

By *Liggy Webb*

To cope with stress:

*\*Develop ways to work smarter, not harder.* Do not blame everything and everyone around you for the stress you feel, but take responsibility for developing a different approach.

*\*Worry less.* Worrying about negative outcomes just leads to additional stress.

*\*Embrace change.* It is inevitable in our ever-evolving world.

*\*Be more assertive.* Avoid taking on more than you can manage, and look for ways to negotiate positive, win-win outcomes for all.

*\*Manage anger.* Do not hesitate to get one-on-one counseling, if necessary.

*\*Develop healthier eating habits.* Avoid caffeine and reduce your alcohol intake.



## How to Make a Donation

Donated funds are used for future Metabolic Family Workshop Days as well as further teaching and education. If you wish to make a donation, do so on the **The Children's Health Foundation website** [www.childhealth.ca](http://www.childhealth.ca)

Ways to Give/ Under Giving Options: donate now/ Select: Make a Donation or Join Caring Heart Monthly Giving /Follow the prompts and it will give an online form with a comment box in the payment area that you can type in and instruct the funds go to the *Inherited Metabolic Disorders Program*.

If you would like to donate by phone with your credit card, please call 519.432.8564 or toll-free at 1.888.834-2496, Monday to Friday, 9 am to 5 pm.

Your donation is tax deductible, and an income tax receipt will be mailed to you.  
**Thank you!**





**Myah, 9 years old**

MCADD

## Contact Information

Editor: Janice Little  
LHSC - Medical Genetics Program of Southwestern Ontario  
Tel: 1.800.243.8416  
1.519.685.8453

Email: [janice.little@lhsc.on.ca](mailto:janice.little@lhsc.on.ca)

Website: [http://www.lhsc.on.ca/Patients\\_Families\\_Visitors/Genetics/Inherited\\_Metabolic/index.htm](http://www.lhsc.on.ca/Patients_Families_Visitors/Genetics/Inherited_Metabolic/index.htm)

Parent Support Contact: Jennifer Culp

Tel: 1.519.632.9924

Email: [jennc2011@hotmail.ca](mailto:jennc2011@hotmail.ca)