



RAVICTI[®]
(glycerol phenylbutyrate) Oral Liquid

A GUIDE TO LIVING WITH A UREA CYCLE DISORDER (UCD)

SELECT IMPORTANT SAFETY INFORMATION

What is RAVICTI?

RAVICTI (glycerol phenylbutyrate) Oral Liquid is a prescription medicine used for long-term management of high blood levels of ammonia (hyperammonemia) caused by a condition called a urea cycle disorder (UCD). RAVICTI should be used if the UCD cannot be managed with a low-protein diet and dietary supplements alone.

RAVICTI must be used along with a low-protein diet and in some cases, dietary supplements.

RAVICTI is not used to treat extremely high levels of ammonia in the blood (hyperammonemic crisis) in people with UCDS.

It is not known if RAVICTI is safe and effective for the treatment of *N*-acetylglutamate synthase (NAGS) deficiency.

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

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Please see the Important Safety Information for RAVICTI on pages 42 through 45 and [click here for the Medication Guide](#).

WELCOME TO YOUR UCD GUIDE

Living with a urea cycle disorder (UCD) comes with a lot of responsibility and a lot of emotions. It can be scary, it can be overwhelming, and it can be rewarding—sometimes all at once.

Getting a UCD diagnosis is the first step on a lifelong journey, and it helps to know there are others who have been in the same situation. Making a treatment decision is the next step, and it's one that is important for your whole family. Managing a UCD can sometimes feel daunting, but RAVICTI® (glycerol phenylbutyrate) Oral Liquid and this guide are here to help. There are many resources available to you and your family, including UCD education, treatment support, and a community ready to help and guide you.

**As Amy, mother of Mya, says,
“You’re not alone. You have resources.
Don’t be afraid to reach out.”**

SELECT IMPORTANT SAFETY INFORMATION

What is the most important safety information I should know about RAVICTI?

RAVICTI may cause serious side effects, including:

Nervous system side effects (Neurotoxicity). The breakdown of RAVICTI produces the byproduct phenylacetate (PAA), which may cause nervous system side effects.

Call your doctor or get medical help right away if you have any of these symptoms while taking RAVICTI:

- sleepiness
- lightheadedness
- change in taste
- problems with hearing
- confusion
- problems with memory
- worsening of numbness, tingling, or burning in your hands or feet
- headache
- feeling very tired (fatigue)
- nausea
- vomiting

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).



◀ DAVID

ISAAC ▶



UREA CYCLE DISORDERS (UCDs)

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

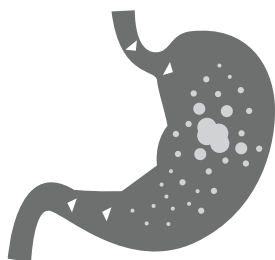
“My son’s now in college. My wife is getting lovelier every year. We’re looking forward to what’s in front of us.”

— DAVID

WIFE, PATRICIA, AND SON, ISAAC,
LIVE WITH UCDS

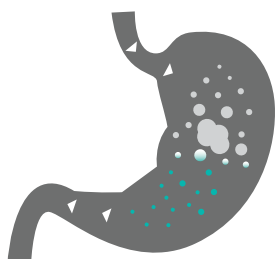
UNDERSTANDING UREA CYCLE DISORDERS

What is the urea cycle?



1

When we eat protein, our bodies break it down into smaller parts.



2

As protein is broken down, a waste product called ammonia is created.



3

The liver helps our bodies change that ammonia into urea, which we get rid of naturally through urine. This process all happens in the urea cycle.



Stomach



Liver



Protein



Urea

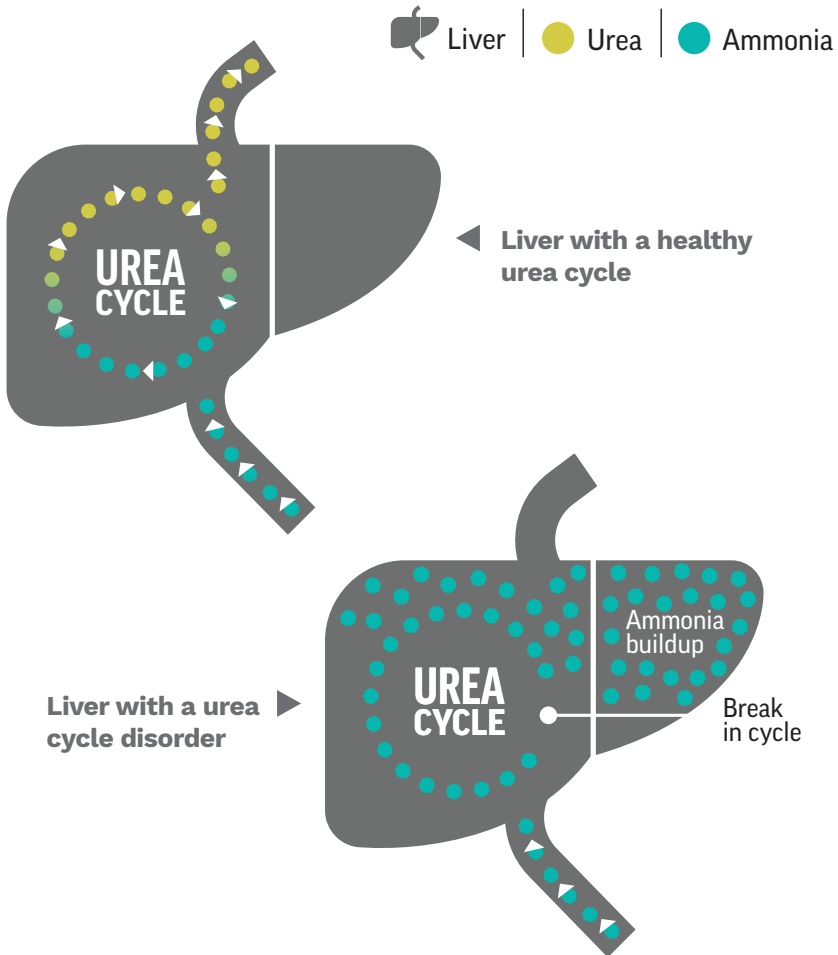


Ammonia

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

What is a urea cycle disorder?

A urea cycle disorder, also known as a UCD, is a rare genetic condition that a person is born with. In people with UCDs, an enzyme or a transporter in the urea cycle is missing or doesn't work. Because of this, the body can't process ammonia properly. Instead of being turned into urea in the liver, ammonia builds up in the body, including in the blood and the brain. This can be dangerous and cause serious health problems, like coma or brain damage.

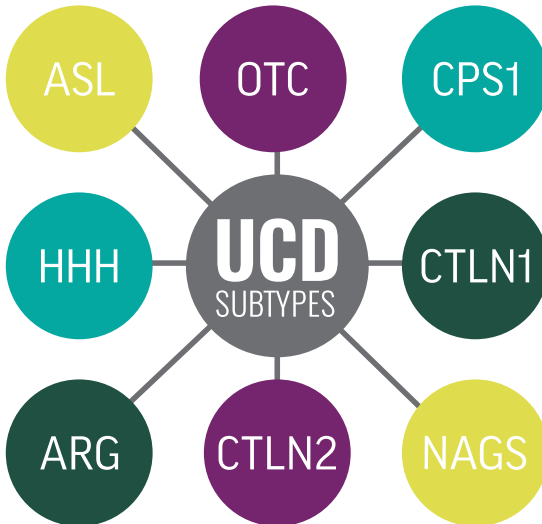


Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

UCD subtypes

Different genes cause different types of UCDs. There are 8 different types of UCDs, often called “subtypes”:

- Ornithine transcarbamylase (OTC) deficiency—the most common UCD
- Carbamylphosphate synthetase 1 (CPS1) deficiency
- Citrullinemia I (CTLN1)
- Argininosuccinic lyase (ASL)
- Arginase deficiency (hyperargininemia, ARG)
- Hyperornithinemia-hyperammonemia-homocitrullinuria (HHH) syndrome
- Citrullinemia II (CTLN2)
- N-acetylglutamate synthetase (NAGS) deficiency*



The name of the subtype tells you which enzyme or transporter in the urea cycle doesn't work. For example, if you have an ornithine transcarbamylase deficiency, it means your ornithine transcarbamylase enzyme is missing or not working.

*It is not known if RAVICTI® (glycerol phenylbutyrate) Oral Liquid is safe and effective for the treatment of NAGS deficiency.

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

What is hyperammonemia?

When there is too much ammonia in the blood, it's called hyperammonemia (hi-per-am-oh-NEE-me-uh). Hyperammonemia can be very harmful to the body, and especially to the brain. Too much ammonia can damage brain cells and cause problems with memory and the ability to think. Over time, elevated ammonia can affect the brain so much that it can lead to behavior problems, tiredness, and even serious health problems, like seizure and coma.

Hyperammonemia symptoms in babies

Signs of hyperammonemia in babies may be different. A baby with a UCD may be irritable at first or refuse feedings. This may be followed by vomiting and increasing sleepiness. If the UCD is left untreated, the baby may have seizures, floppiness, and breathing problems. High levels of ammonia are especially dangerous for babies because their brains are growing and developing.

What is a hyperammonemic crisis?

Hyperammonemia can lead to a hyperammonemic crisis, which happens when the amount of ammonia in the blood is dangerously high. A hyperammonemic crisis is a medical emergency that can lead to serious health issues, like brain damage or coma, and requires medical attention right away.

It's possible to experience hyperammonemia, or too much ammonia in the blood, without it leading to a hyperammonemic crisis. However, any signs of high ammonia could mean that people with UCDs are at risk for a crisis, so they should always tell their doctor about their symptoms.

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

Signs of hyperammonemia or hyperammonemic crisis include:



Loss of appetite



Confusion



Headache or migraine



Vomiting



Lethargy (being more tired than usual)



Behavioral abnormalities (being irritable/difficult)



Seizures

Any of these signs and symptoms could mean that the amount of ammonia in the blood needs to be lowered.

SELECT IMPORTANT SAFETY INFORMATION

RAVICTI® (glycerol phenylbutyrate) Oral Liquid is not used to treat extremely high levels of ammonia in the blood (hyperammonemic crisis) in people with UCDS.

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

What can trigger hyperammonemia or a hyperammonemic crisis?

There are several things that can cause ammonia levels to rise:

- Heat
- Viral infections (like a cold or the flu)
- Physical or emotional stress
- Dehydration
- Trauma
- The menstrual cycle
- Changes in diet

If you are suffering from a hyperammonemic crisis, you should go to the emergency room (ER) immediately. Because it's important to receive treatment as quickly as possible, you or someone who cares for you should call ahead to let the ER know you are coming. You may need to explain what a UCD and a hyperammonemic crisis are.

Many people have what they call a "medical protocol letter" written by their doctor. This letter is directed at ER staff. It explains how to treat an individual with a UCD when he or she has high ammonia levels or is having a hyperammonemic crisis. It also gives instructions on how to contact the individual's doctor. Talk with your doctor about writing a medical protocol letter that you can keep with you at all times.

THE GENETICS OF UCDs

How does someone get a UCD?

A UCD is a genetic disorder. This means it is caused by a defective gene or genes, which can be inherited from one or both parents. UCDs can also be caused by a random genetic mutation.

There are 3 ways someone can get a UCD:

1

X-linked

One parent (typically the mother) passes a defective gene on to his or her child via the X chromosome.

2

Autosomal recessive

Both parents pass a defective gene on to their child via any chromosome other than the X or Y chromosomes.

3

Random mutation

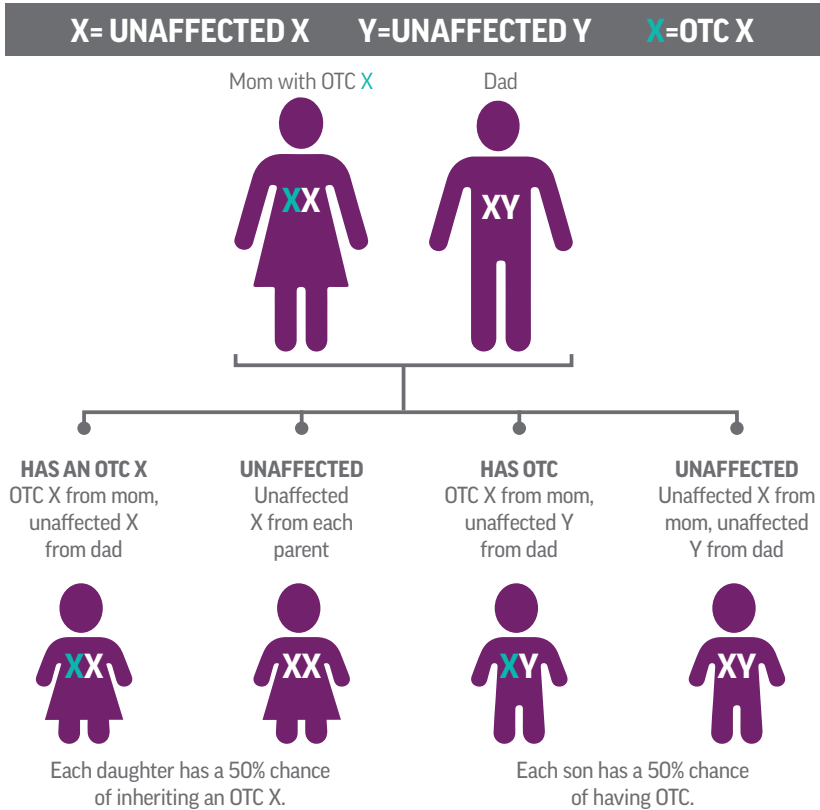
A mutation happens for the first time when the cells are forming, creating a defective gene or genes that cause a UCD.

X-linked UCDs

The most common type of UCD is OTC deficiency. OTC is the only X-linked UCD. This means it may be passed down via a gene on the X chromosome.[†] OTC deficiency is typically passed from the mother to her son or daughter. In rare cases, OTC can also be passed from a father to his daughter.

Inheriting OTC

This is how OTC can be inherited from the mother:

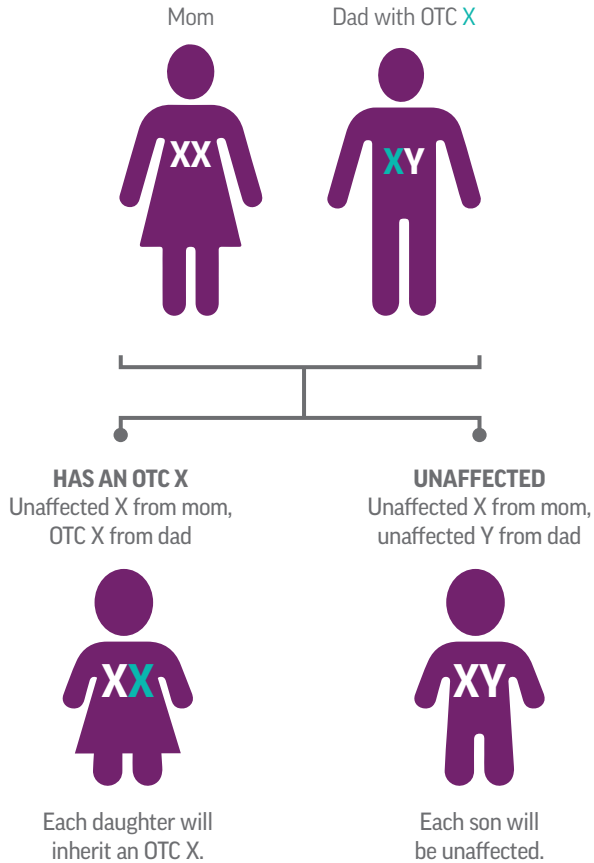


[†]Some people have OTC deficiency caused by a random (or “de novo”) mutation. This means OTC was **not inherited** from their parents; however, OTC **can still be passed on** to their children.

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

This is how OTC can be inherited from the father:

X= UNAFFECTED X Y=UNAFFECTED Y X=OTC X

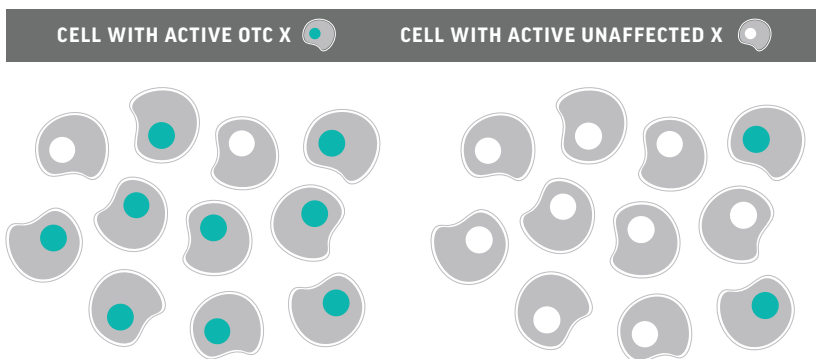


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Differing levels of OTC in women

Women with OTC have 1 unaffected X chromosome and 1 OTC X chromosome in every one of their cells. One of these Xs will always be “active” and the other will be “inactive.” Which one is active and which one isn’t is decided randomly for each cell.

Multiple women in the same family can have OTC but may experience different severities of symptoms. One may have very subtle UCD symptoms, while others may have symptoms that are more severe. Some may not even realize that the symptoms they experience are related to OTC. The severity of a woman’s symptoms has to do with which X chromosome is active in each of her cells.



In some women, the majority of cells may have an active OTC X. These women will experience UCD symptoms. The more active OTC Xs they have, the more severe their symptoms will be.

In other women, the majority of cells may have an active unaffected X. These women may experience very few UCD symptoms or none at all.

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

Subtle symptoms of OTC

Women may not know they carry the OTC gene until someone else in their family is diagnosed with a UCD. However, they may experience subtle UCD symptoms, like headaches or migraines, fatigue, confusion, trouble concentrating, or a tendency to avoid foods that are high in protein (eg, meat, fish, and eggs). Even mild symptoms can mean ammonia levels are high, which can be harmful over time. It's important to talk to a doctor about these symptoms to find out if treatment is necessary.

Since parents pass their genes on to their children, people in the same immediate and extended families have some of the same genes. The way genes are passed down is random, so the outcomes will be different for every family. **However, if one person in your family has OTC, there may be others who are affected as well.** It's important to talk to your doctor or genetic counselor about who in your immediate and extended family should be tested.

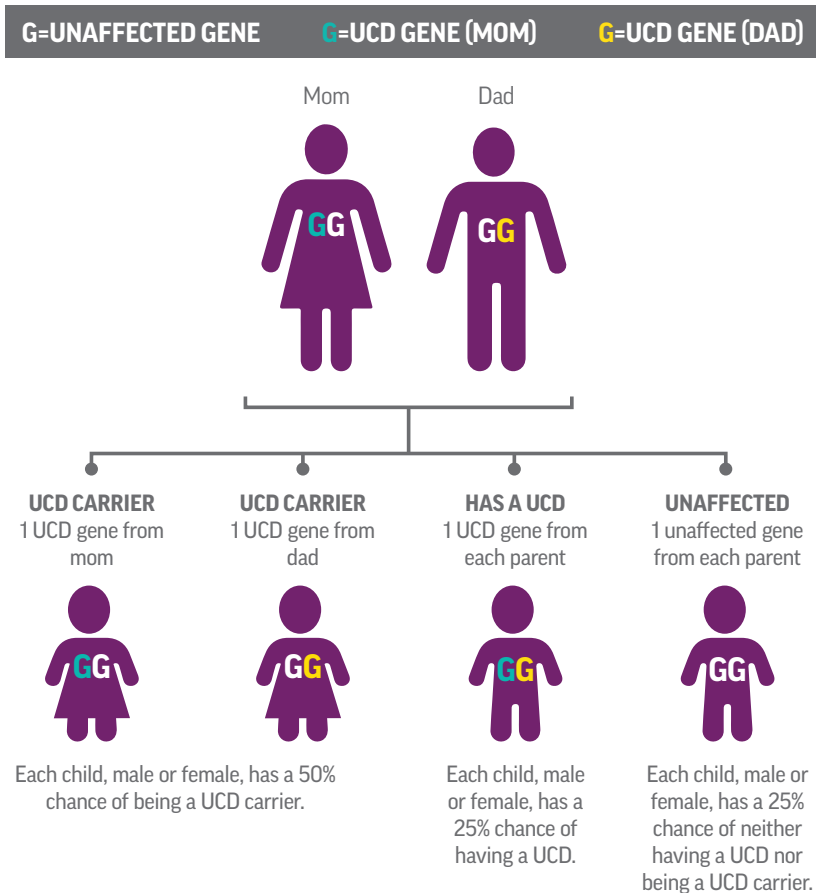
Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

Autosomal recessive UCDs

Autosomal recessive means that 2 copies of a defective gene that causes a UCD were inherited, with 1 copy coming from each parent. Since the parents each have only 1 copy of the defective gene, they are considered autosomal recessive carriers. Autosomal recessive carriers do not experience UCD symptoms. **All UCD subtypes except OTC are autosomal recessive.**

Inheriting an autosomal recessive UCD


This is what can happen when each parent has 1 copy of a UCD gene:



Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

Random mutations

Some UCDs are caused by a random mutation. This means that a mutation happened when cells were first forming, and the mutation created a defective gene that caused a UCD. **People with a random mutation did not inherit the defective UCD gene or genes from their parents.** However, they **can** pass their defective UCD gene on to their children.



“After Mya was diagnosed with OTC deficiency, we learned it’s typically inherited from the mother. So I got tested and found out I’m an OTC carrier. My mom and sister also got tested, but neither of them are carriers. Our doctor explained that I had a spontaneous mutation that created a defective gene which caused OTC, and I passed that gene on to Mya.”

—AMY

DAUGHTER, MYA, LIVES WITH A UCD

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click [here](#) for the [Medication Guide](#).

UCDs are diagnosed by a genetic test

When you get a genetic test, doctors review the results and look closely at your DNA to see if you have any defective genes that can cause a UCD. Your doctor will take a sample of your DNA, usually by drawing blood or swabbing the inside of your mouth. Then he or she will send your sample to a lab. The lab will look at your DNA to see if there are any defective genes. If a defective gene or genes are found, it may mean that you have a genetic condition, like a UCD. The results of a genetic test can also tell you the chances of passing a UCD on to your children.

If one person in a family has been diagnosed with a UCD, other family members should be tested, especially parents and siblings. It's also possible that extended family members may have a UCD and don't know it.

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

UCD MANAGEMENT

Low-protein diet

One way to reduce the amount of ammonia in the body is to eat less protein. A low-protein diet is key to managing ammonia levels. We all need some protein to grow and stay healthy, but the right amount of protein is different for everyone. Limiting it too much may cause your body harm. You may also be able to handle more or less protein based on your age and the severity of your UCD. A dietitian can help you understand daily protein goals and manage a low-protein diet. A dietitian will also help make sure your diet is balanced and includes enough nutrients and calories.



Visit [RAVICTI.com](https://ravicti.com) to sign up for our free cookbook, full of easy, nutritious, low-protein meals and snacks.

Dietary supplements

Some nutrients, like certain amino acids, are found only in protein. Your dietitian may suggest daily dietary supplements to make sure you are getting all of the necessary vitamins and nutrients that may be missing from a diet limited in protein.

Medicine

Sometimes a low-protein diet and supplements aren't enough to keep ammonia levels low. In these cases, medicines called nitrogen scavengers (also referred to as "ammonia scavengers") may be added to your UCD treatment plan. Nitrogen scavengers remove ammonia from the bloodstream.

RAVICTI® (glycerol phenylbutyrate) Oral Liquid is a nitrogen-scavenger treatment that can be used in adults and children for the long-term management of elevated levels of ammonia caused by a UCD.

RAVICTI is not used to treat extremely high levels of ammonia in the blood (hyperammonemic crisis) or for NAGS deficiency.

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

AMY ▶

MYA ▼



RAVICTI® (GLYCEROL PHENYL BUTYRATE) ORAL LIQUID

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and [click here for the Medication Guide.](#)

**“You can’t give up.
It’s going to be
hard. It’s going to be
exhausting, but you
can do it. Your child
can do it. And you’re
not alone. Don’t be
afraid to reach out.
And when people offer
you help, take it.”**

— AMY

DAUGHTER, MYA,
LIVES WITH A UCD

THE IMPORTANCE OF AMMONIA CONTROL

Even if you've never had a hyperammonemic crisis, high levels of ammonia in the blood can still be harmful. That's why one of the most important goals of managing a UCD is to keep the amount of ammonia in your blood at a safe and normal level.

Having a blood test is the only way to find out what your ammonia level is. Since there is no way to measure ammonia levels at home, the most important thing you can do is stick to your UCD management plan to help keep your ammonia levels in check. This can include following a low-protein diet, staying hydrated, avoiding strenuous activity, and taking a nitrogen-scavenger medicine (sometimes called an ammonia scavenger), like RAVICTI. When taken as prescribed by your doctor, **RAVICTI is proven to provide 24-hour ammonia control.**

Treating most types of UCDs with RAVICTI® (glycerol phenylbutyrate) Oral Liquid

Along with a low-protein diet that may include supplements, RAVICTI has been proven to help manage ammonia levels for babies, toddlers, children, and adults with UCDs. RAVICTI is for people of any age whose UCD cannot be managed by diet and supplements alone. RAVICTI must be used with a low-protein diet and, in some cases, with dietary supplements.

RAVICTI is not used to treat extremely high levels of ammonia in the blood (hyperammonemic crisis) or for NAGS deficiency.

SELECT IMPORTANT SAFETY INFORMATION

Who should not take RAVICTI?

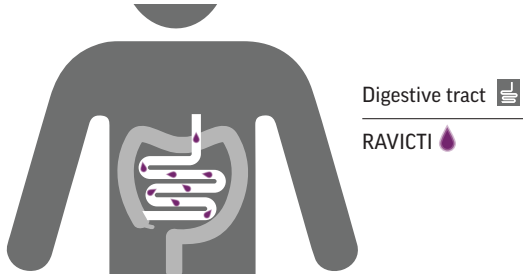
Do not take RAVICTI if you are allergic to phenylbutyrate. Call your doctor or go to the nearest hospital emergency room if you experience any of the following symptoms of an allergic reaction while taking RAVICTI:

- wheezing
- cough
- flushing
- shortness of breath
- low blood pressure
- nausea
- skin rash

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

How RAVICTI® (glycerol phenylbutyrate) Oral Liquid works in the body

RAVICTI is an ammonia-removing medicine that binds to the ammonia in your blood and removes it from the body. It is taken 3 or more times daily and keeps working in your body throughout the day.



When a dose of RAVICTI travels through the body, it is not released right away. A naturally occurring enzyme in the digestive tract slowly unlocks RAVICTI so it can start working. Once unlocked, the medicine in RAVICTI is gradually released so it can help control ammonia levels when given as indicated.

Taking RAVICTI regularly and as prescribed is key to keeping ammonia levels under control over a long period of time.

SELECT IMPORTANT SAFETY INFORMATION

What should I tell my doctor before taking RAVICTI?

Tell your doctor about any medical conditions and if you:

- Have liver or kidney problems.
- Have pancreas or bowel (intestine) problems.
- Are pregnant or plan to become pregnant. It is not known if RAVICTI will harm your unborn baby.
 - **Pregnancy Registry:** There is a Pregnancy Registry for women who take RAVICTI just before becoming pregnant or who become pregnant during treatment with RAVICTI. The purpose of this registry is to collect information about the health of you and your baby. Talk to your doctor about how you can join the Pregnancy Registry. For more information about this registry, call 1-855-823-2595 or visit www.ucdregistry.com.
- Are breastfeeding or plan to breastfeed. It is not known if RAVICTI passes into your breast milk. Breastfeeding is not recommended during treatment with RAVICTI. Talk to your doctor about the best way to feed your baby if you take RAVICTI.

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).



“The ammonia scavenger she was on could leave a bad taste in the mouth. It was challenging to just flat out get her to take it. For us, starting RAVICTI® (glycerol phenylbutyrate) Oral Liquid was pretty easy. It was easy for her to take, and she got the RAVICTI at the same time every day that she got the other medication. Every family's experience is different, but for us, we continue to like the convenience.”

—AMY

DAUGHTER, MYA,
LIVES WITH A UCD



“When I found out about RAVICTI, I was ready for a change. I was excited because I didn't have to count out so many pills. I did not realize how much time that took. I chose RAVICTI because it's easy for me to take, and I can move on to whatever else I need to do.”

—LAUREN

LIVES WITH A UCD



“Before RAVICTI, the medicine that they were taking was burdensome. It took a lot of time to prepare. Everything we did revolved around taking medicine. Not everyone is this way, but for us, RAVICTI made a difference.”

—DAVID

WIFE, PATRICIA, AND SON, ISAAC, LIVE
WITH UCDS

CONVENIENCE AND EASY DOSING



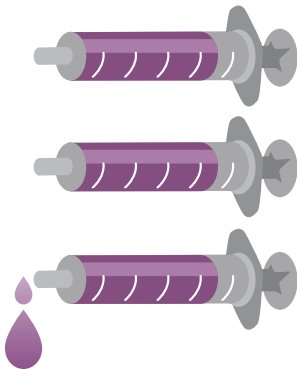
Odorless and nearly
tasteless liquid



Easy to prep



Taken by mouth
with meals



RAVICTI® (glycerol phenylbutyrate) Oral Liquid is a **medicine that can be taken by mouth** or feeding tube—no pills to swallow or powder to mix.

RAVICTI is taken as few as **3 times per day** with food or formula.

Taking RAVICTI

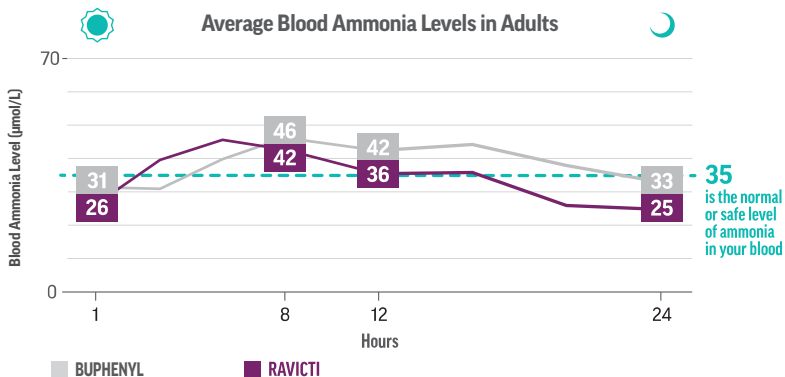
Take RAVICTI exactly as your doctor has prescribed it. Babies and toddlers may be prescribed 3 or more doses per day. Do not change your dose of RAVICTI without a doctor's permission. If you take too much RAVICTI, call your doctor or go to the nearest hospital ER right away. The maximum approved daily dose of RAVICTI is 17.5 mL for both adults and children. If you miss a dose, talk to your doctor.

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and [click here for the Medication Guide](#).

RESULTS WITH RAVICTI

RAVICTI® (glycerol phenylbutyrate) Oral Liquid helps control ammonia levels throughout the day and night

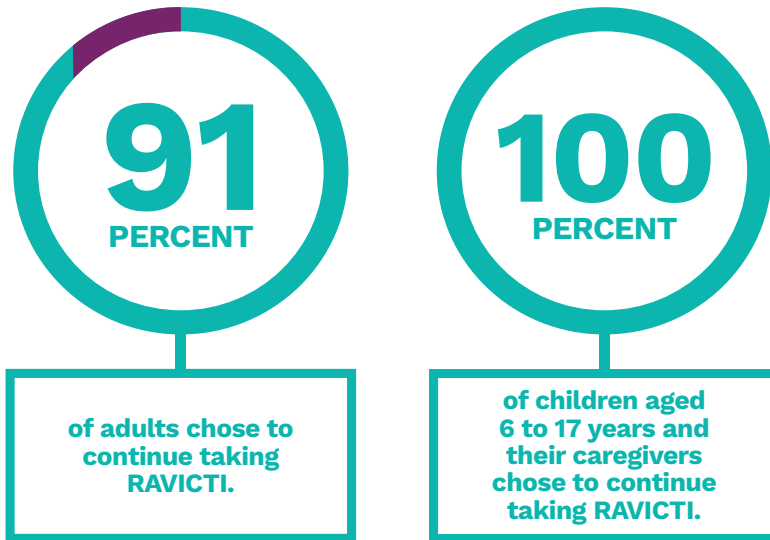
- A team of doctors conducted the following studies (ranging from 2 weeks to 4 weeks) to learn if RAVICTI, like the UCD medicine BUPHENYL® (sodium phenylbutyrate), helps keep ammonia levels in a safe and normal range: 4 short-term studies, 3 phase 2 studies, and 1 phase 3 study (pediatric: 2 phase 2 studies; adult: 1 phase 2 study and 1 phase 3 study).
- To do this, the doctors measured ammonia levels in people taking RAVICTI or BUPHENYL over 24 hours.
- The results showed that RAVICTI was similar to BUPHENYL in safely controlling ammonia levels for 24 hours. The chart below shows how RAVICTI keeps ammonia levels consistent throughout the day.



RAVICTI[®]
(glycerol phenylbutyrate) Oral Liquid

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#). Please see the Important Safety Information for BUPHENYL on pages 46 through 47 and click here for the [Patient Package Insert](#).

After using RAVICTI for 2 weeks in the studies, people with UCDs and their caregivers were asked if they wanted to continue using RAVICTI for up to a year.



RAVICTI® (glycerol phenylbutyrate) Oral Liquid for adults

In adults, RAVICTI helped keep blood ammonia levels within a normal range[†] during 12 months of treatment.

- In a study of 51 adults:
 - 7 adults (14%) reported a total of 10 hyperammonemic crises

[†]Range of 6 to 30 $\mu\text{mol/L}$.

SELECT IMPORTANT SAFETY INFORMATION

What are possible side effects of RAVICTI?

RAVICTI may cause serious side effects, including:

- See "**What is the most important information I should know about RAVICTI?**"

The most common side effects of RAVICTI in adults include diarrhea, gas, headache, abdomen (stomach) pain, vomiting, tiredness, decreased appetite, and indigestion or heartburn.

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

RAVICTI® (glycerol phenylbutyrate) Oral Liquid for children and teens

In children and teens, RAVICTI helped keep blood ammonia levels within a normal range[§] during 12 months of treatment.

- In a study of 26 children and teens aged 6 to 17 years:
 - 5 children and teens (19%) reported a total of 5 hyperammonemic crises
- In a study of 16 children aged 2 to 5 years:
 - 2 children (13%) reported a total of 3 hyperammonemic crises

[§]Range of 17 to 23 $\mu\text{mol/L}$.

RAVICTI for babies and toddlers

In medical studies that lasted up to 18 months, RAVICTI helped keep ammonia levels in a normal range^{||} for babies and toddlers younger than 2 years.

- In multiple studies, with a total of 17 babies and toddlers aged 2 months to less than 2 years:
 - 6 babies and toddlers (35%) reported a total of 10 hyperammonemic crises
- In a study of 16 babies younger than 2 months:
 - 5 babies (31%) reported a total of 7 hyperammonemic crises

^{||}Range of 28 to 57 $\mu\text{mol/L}$.

SELECT IMPORTANT SAFETY INFORMATION

The most common side effects of RAVICTI in children 2 years to 17 years of age include upper abdomen (stomach) pain, rash, nausea, vomiting, diarrhea, decreased appetite, and headache.

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

INFORMATION ABOUT DOSING

Take RAVICTI exactly as your doctor has prescribed. Babies and toddlers may be prescribed up to 3 or more doses per day. Do not change your dose of RAVICTI without a doctor's permission. If you take too much RAVICTI, call your doctor or go to the nearest hospital ER right away. The maximum approved daily dose of RAVICTI is 17.5 mL for both adults and children.# If you miss a dose, talk to your doctor.

#Total daily RAVICTI dose:

- Adults and children aged 2 years and up: given in 3 equally divided doses, each rounded up to the nearest 0.5 mL
- Babies and toddlers younger than 2 years: given in 3 or more equally divided doses, each rounded up to the nearest 0.1 mL

How to take RAVICTI® (glycerol phenylbutyrate) Oral Liquid

RAVICTI is a liquid medicine that is odorless and nearly tasteless. There are no pills to swallow or powders to mix.

- RAVICTI can be taken by mouth, feeding tube, or gastrostomy tube (G-tube). In people who can swallow safely, RAVICTI can be taken by mouth, even if the person has a G-tube.
- Adults and children 2 years and older take RAVICTI as few as 3 times per day.
- Babies and toddlers younger than 2 years take 3 or more equal doses of RAVICTI each day with food or formula.
- People who take RAVICTI must follow a low-protein diet and, in some cases, take dietary supplements.
- In babies who are breastfeeding, give RAVICTI just before breastfeeding.

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

Simple steps to taking RAVICTI® (glycerol phenylbutyrate) Oral Liquid by mouth

Getting started: All it takes is 1 twist off and 1 twist on.

Remove the childproof cap on the RAVICTI bottle by pushing down on the cap while twisting it to the left. Then, attach the blue AdaptaCap® Bottle Adapter onto the bottle by twisting it to the right.



Fill the syringe: It's as easy as "hold, flip, pull."

Hold the RAVICTI bottle securely as you place the tip of the oral dosing syringe into the AdaptaCap Bottle Adapter. Flip the bottle upside down with the oral dosing syringe still inserted. Pull the plunger of the oral dosing syringe back slowly to draw up the amount of RAVICTI prescribed by your doctor. Don't forget to turn the bottle upright again. **Tip:** Pulling slowly will help avoid large air bubbles from forming in the medicine.

Easy to take: Squirt RAVICTI right into the mouth.

Once the oral dosing syringe is ready, place it into the mouth. Push the plunger to squirt all of the medicine directly into the mouth.



Wash it down: Take RAVICTI with water or food.

Ensure the full dose of RAVICTI is swallowed completely by drinking liquid or eating some food. Breakfast, lunch, or dinner, RAVICTI can work with the timing of your meals.

For dosing guides and helpful videos, including how to administer RAVICTI through a G-tube, visit [RAVICTI.com/how-to-take-RAVICTI](https://www.ravicti.com/how-to-take-ravicti).

SELECT IMPORTANT SAFETY INFORMATION

The most common side effects of RAVICTI in children 2 months to less than 2 years of age include low white blood cell count (neutropenia), vomiting, constipation, diarrhea, fever, reduced food intake, cough, stuffy nose, runny nose, skin rash, and small round bumps on the skin.

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

FILLING YOUR PRESCRIPTION

Medicines like RAVICTI® (glycerol phenylbutyrate) Oral Liquid that treat rare or serious conditions are called specialty medicines. These medicines may need to be handled carefully or taken in a certain way. Usually, you can only get these medicines at a specialty pharmacy. When your doctor prescribes RAVICTI, it will be sent to you from a specialty pharmacy.

What is a specialty pharmacy?

Unlike a local retail pharmacy, a specialty pharmacy takes care of getting your medicine from start to finish. Your specialty pharmacy will get your prescription from your doctor and send RAVICTI straight to your house or doctor's office.

A specialty pharmacy can provide:



Convenient deliveries to your home, office, or other location



Shipment of medicine supplies, such as caps or syringes



Refills of medicine before you run out



24/7 on-call pharmacist support

SELECT IMPORTANT SAFETY INFORMATION

The most common side effects of RAVICTI in children less than 2 months of age include vomiting, rash, gastroesophageal reflux, increased levels of liver enzymes in the blood, decreased appetite and reduced food intake, low red blood cell count (anemia), cough, loss of too much body fluid (dehydration), too much acid in the blood (acidosis), high blood platelet count (thrombocytosis), low blood platelet count (thrombocytopenia), low blood neutrophil count (type of white blood cell) (neutropenia), high white blood cell count (lymphocytosis), diarrhea, gas, constipation, fever, drowsiness (lethargy), irritability, and agitation.

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).



◀ LAUREN



UCD SUPPORT

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and [click here for the Medication Guide.](#)

“I want people to see that even though you have a UCD, you can do so many things. Just because you have a urea cycle disorder doesn’t mean you can’t live a fulfilled life.”

— LAUREN
LIVES WITH A UCD

“We work with a PAM and she is fabulous. She helps us navigate our little network, especially making sure our medicine comes in on time and gets to us safely. She does a wonderful job.”

—PATRICIA

LIVES WITH A UCD, AND SON, ISAAC,
LIVES WITH A UCD

SUPPORT FROM YOUR PATIENT ACCESS MANAGER (PAM)

Horizon Patient Services offers ongoing support for people with UCDS

Horizon Patient Services™ is dedicated to improving the lives of people living with UCDS. The Horizon Patient Services program provides ongoing individualized support and education for you and your family.

Your PAM leads your dedicated Horizon Patient Services team that is here to help you, from answering questions as you start taking RAVICTI® (glycerol phenylbutyrate) Oral Liquid and through every step along the way. Your PAM is available in person or by email, text, or phone with information and guidance.

These comprehensive services are free of charge and built around 3 components:
coordinate, connect, and champion.

HORIZON
Patient Services™

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).

Your Horizon Patient Services team will:

Coordinate

- Work with you and your doctor's office to simplify the process of getting started on your medicine
- Help address financial barriers by researching your insurance benefits, finding out what your insurance will cover, explaining your insurance options, and connecting you to financial assistance options
- Assist in connecting with your specialty pharmacy to schedule the shipment of your medicine so that you avoid running out of supply



Connect

- Connect you and your family to others living with UCDs through live events, peer-mentor programs, and online resources
- Provide helpful tools and resources to manage the day-to-day challenges of living with a UCD
- Introduce you and your family to UCD advocacy groups for more support and inform you of UCD events in your area



Champion

- Serve as your dedicated personal resource and the main point of contact for your ongoing RAVICTI® (glycerol phenylbutyrate) Oral Liquid logistical needs
- Provide UCD education and answer non-treatment-related questions
- Help you through changes along the way that may impact your treatment
- Respond to your questions and concerns and connect you with the right resources to get answers



Talk to your PAM today. To get started, call **1-855-823-7878**.

Please see the **Important Safety Information for RAVICTI** on pages 42 through 45 and click here for the **Medication Guide**.

UCD FAMILIES ARE HERE TO HELP

Do you ever feel like family and friends don't understand what it's like to live with a UCD? Let us help you connect with others who know what you're going through because they live with UCDs every day too. They're here to answer your questions and support you during your UCD journey.

Talk with someone who's been there

Sign up to talk with a member of the UCD community. They can provide insight and support around the following topics:

- Support for newly diagnosed families
- UCDs at work
- Managing symptoms
- Support for school-aged children
- UCDs at school
- Having a UCD gene
- Support for teens
- UCDs at home (siblings, spouses, relationships)
- Navigating a hospital visit
- Support for caregivers
- UCDs and diet/exercise
- Starting RAVICTI® (glycerol phenylbutyrate) Oral Liquid

Visit [RAVICTI.com](https://www.ravicti.com) to schedule your talk today!

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and click here for the [Medication Guide](#).



“It’s hard at the end to take a little time away for yourself. But if you can’t take care of yourself, how can you take care of the ones you love?”

—PATRICIA

LIVES WITH A UCD, AND SON, ISAAC,
LIVES WITH A UCD



“To be a mother of a child with a rare disease, you have to find your own voice, and you have to not be afraid to use it.”

—AMY

DAUGHTER, MYA, LIVES WITH A UCD



“I remember growing up thinking that the only UCD people in the whole world were me and my mama. But now, I know that’s not true. There are many people who have UCDs. I want them to know that they have people out there that have been through similar experiences.”

—LAUREN

LIVES WITH A UCD



“I definitely think when I started to take care of myself, my parents felt a lot more confident in letting me do my own thing. I was proving that I was able to take care of myself. I knew what I was doing.”

—ISAAC

LIVES WITH A UCD

SUPPORT FOR UCDs

Additional support is available online through other UCD community organizations. These organizations provide education and resources for people with UCDs and other rare conditions:

- **National Urea Cycle Disorders Foundation (NUCDF)**
www.nucdf.org
- **Connecting Families UCD Foundation (CFUCDF)**
www.ucdfamily.org
- **National Organization for Rare Disorders (NORD)**
www.rarediseases.org
- **Global Genes**
www.globalgenes.org
- **Urea Cycle Disorders Consortium (UCDC)**
www.rarediseasesnetwork.org/cms/ucdc

All of the websites listed here are maintained by a third party that is solely responsible for the site's contents. We encourage you to read the privacy policy of every website you visit.

USE AND IMPORTANT SAFETY INFORMATION

Please see the Important Safety Information for RAVICTI on pages 42 through 45 and [click here for the Medication Guide](#).

USE and IMPORTANT SAFETY INFORMATION

What is RAVICTI?

RAVICTI (glycerol phenylbutyrate) Oral Liquid is a prescription medicine used for long-term management of high blood levels of ammonia (hyperammonemia) caused by a condition called a urea cycle disorder (UCD). RAVICTI should be used if the UCD cannot be managed with a low-protein diet and dietary supplements alone. RAVICTI must be used along with a low-protein diet and in some cases, dietary supplements.

RAVICTI is not used to treat extremely high levels of ammonia in the blood (hyperammonemic crisis) in people with UCDs.

It is not known if RAVICTI is safe and effective for the treatment of *N*-acetylglutamate synthase (NAGS) deficiency.

IMPORTANT SAFETY INFORMATION

What is the most important safety information I should know about RAVICTI?

RAVICTI may cause serious side effects, including:

Nervous system side effects (Neurotoxicity). The breakdown of RAVICTI produces the byproduct phenylacetate (PAA), which may cause nervous system side effects.

Call your doctor or get medical help right away if you have any of these symptoms while taking RAVICTI:

- sleepiness
- lightheadedness
- change in taste
- problems with hearing
- confusion
- problems with memory
- worsening of numbness, tingling, or burning in your hands or feet
- headache
- feeling very tired (fatigue)
- nausea
- vomiting

Please see additional Important Safety Information for RAVICTI through page 45.

IMPORTANT SAFETY INFORMATION (continued)

Who should not take RAVICTI?

Do not take RAVICTI if you are allergic to phenylbutyrate. Call your doctor or go to the nearest hospital emergency room if you experience any of the following symptoms of an allergic reaction while taking RAVICTI:

- wheezing
- shortness of breath
- cough
- low blood pressure
- flushing
- nausea
- skin rash

What should I tell my doctor before taking RAVICTI?

Tell your doctor about any medical conditions and if you:

- Have liver or kidney problems.
- Have pancreas or bowel (intestine) problems.
- Are pregnant or plan to become pregnant. It is not known if RAVICTI will harm your unborn baby.
 - **Pregnancy Registry:** There is a Pregnancy Registry for women who take RAVICTI just before becoming pregnant or who become pregnant during treatment with RAVICTI. The purpose of this registry is to collect information about the health of you and your baby. Talk to your doctor about how you can join the Pregnancy Registry. For more information about this registry, call 1-855-823-2595 or visit www.ucdregistry.com.
- Are breastfeeding or plan to breastfeed. It is not known if RAVICTI passes into your breast milk. Breastfeeding is not recommended during treatment with RAVICTI. Talk to your doctor about the best way to feed your baby if you take RAVICTI.

Please see additional Important Safety Information for RAVICTI through page 45.

IMPORTANT SAFETY INFORMATION (continued)

What are possible side effects of RAVICTI?

RAVICTI may cause serious side effects, including:

- See “[What is the most important information I should know about RAVICTI?](#)”

The most common side effects of RAVICTI in adults include:

- diarrhea
- vomiting
- gas
- tiredness
- headache
- decreased appetite
- abdomen (stomach) pain
- indigestion or heartburn

The most common side effects of RAVICTI in children 2 years to 17 years of age include:

- upper abdomen (stomach) pain
- diarrhea
- rash
- decreased appetite
- nausea
- headache
- vomiting

The most common side effects of RAVICTI in children 2 months to less than 2 years of age include:

- low white blood cell count (neutropenia)
- reduced food intake
- vomiting
- cough
- constipation
- stuffy nose
- diarrhea
- runny nose
- fever
- skin rash
- small round bumps on the skin

Please see additional Important Safety Information for RAVICTI through page 45.

IMPORTANT SAFETY INFORMATION (continued)

The most common side effects of RAVICTI in children less than 2 months of age include:

- vomiting
- rash
- gastroesophageal reflux
- increased levels of liver enzymes in the blood
- decreased appetite and reduced food intake
- low red blood cell count (anemia)
- cough
- loss of too much body fluid (dehydration)
- too much acid in the blood (acidosis)
- high blood platelet count (thrombocytosis)
- low blood platelet count (thrombocytopenia)
- low blood neutrophil count (type of white blood cell) (neutropenia)
- high white blood cell count (lymphocytosis)
- diarrhea
- gas
- constipation
- fever
- drowsiness (lethargy)
- irritability
- agitation

These are not all of the possible side effects of RAVICTI. Call your doctor for medical advice about side effects.

You are encouraged to report negative side effects of prescription drugs to the FDA. Visit <http://www.fda.gov/medwatch> or call 1-800-FDA-1088.

For additional important safety information, click here for the [Medication Guide](#) and discuss with your doctor.

APPROVED USES and IMPORTANT SAFETY INFORMATION for BUPHENYL

What is BUPHENYL?

BUPHENYL (sodium phenylbutyrate) Tablets is a prescription medicine that can be taken by mouth and BUPHENYL (sodium phenylbutyrate) Powder is a prescription medicine that can be taken by mouth or feeding tube for the long-term management of high blood levels of ammonia (hyperammonemia) caused by a condition called a urea cycle disorder (UCD).

BUPHENYL only treats high blood levels of ammonia in patients with the following enzyme deficiencies:

- Carbamylphosphate synthetase (CPS)
- Ornithine transcarbamylase (OTC)
- Argininosuccinic acid synthetase (AS)

BUPHENYL can be used in Infants up to 28 days old who have a complete enzyme deficiency, and in patients 1 month of age and older who have a partial enzyme deficiency and have a history of brain damage from high blood levels of ammonia.

BUPHENYL must be used along with a low-protein diet and in some cases, dietary supplements.

BUPHENYL is not used to treat acute (severe) hyperammonemia, which is a medical emergency.

IMPORTANT SAFETY INFORMATION

What is the most important safety information I should know about BUPHENYL?

BUPHENYL may cause serious side effects, including:

Nervous system side effects (Neurotoxicity). The breakdown of BUPHENYL produces the byproduct phenylacetate (PAA), which may cause nervous system side effects.

Call your doctor or get medical help right away if you experience any of these symptoms while taking BUPHENYL:

- sleepiness
- weakness
- lightheadedness
- problems with memory
- worsening of numbness, tingling, or burning in your hands or feet
- change in taste
- problems with hearing
- confusion
- headache

Please see additional Important Safety Information for BUPHENYL on page 47.

IMPORTANT SAFETY INFORMATION (CONT'D)

Who should not take BUPHENYL?

Do not take BUPHENYL if you are allergic to phenylbutyrate. Call your doctor or go to the nearest hospital emergency room if you experience an allergic reaction while taking BUPHENYL.

What should I tell my doctor before taking BUPHENYL?

Before taking BUPHENYL, tell your doctor about any medical conditions, including if you:

- have heart failure or decreased kidney function, which may lead to retention of the sodium content of BUPHENYL with potentially serious consequences, such as worsening heart failure, high blood pressure, and swelling.
- are pregnant or plan to become pregnant. It is not known if BUPHENYL will harm your unborn baby.
- are breastfeeding or plan to breastfeed. It is not known if BUPHENYL passes into your breast milk. Breastfeeding is not recommended during treatment with BUPHENYL. Talk to your doctor about the best way to feed your baby if you take BUPHENYL.

What are possible side effects of BUPHENYL?

BUPHENYL may cause serious side effects, including:

See "**What is the most important safety information I should know about BUPHENYL?**"

The most common side effects of BUPHENYL include:

- decreased appetite
- bad taste
- body odor
- absent or irregular periods in women

These are not all of the possible side effects of BUPHENYL. Call your doctor for medical advice about side effects.

For additional important safety information, click here for the Full Prescribing Information and Patient Package Insert and discuss with your doctor.

You are encouraged to report negative side effects of prescription drugs to the FDA. Visit <http://www.fda.gov/medwatch> or call 1-800-FDA-1088.

NOTES



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