

Breastfeeding: Treating Cough and Cold Symptoms

Baby it's cold outside...and 'tis the season for MotherToBaby to answer questions about cough and cold medications while breastfeeding.

Some “Cold” Hard Facts

Factors such as your baby's age and whether they were born prematurely or have chronic health problems matter. Very young babies (less than 3 months old) may have a more difficult time metabolizing medications in the milk and may be more susceptible to side effects like sleepiness. Milk is also their complete diet, and some medications can reduce your milk supply. The older your baby is, the less likely it is that the medication will cause a serious problem in your baby, but it is still a good idea to be careful. We also consider how much of the medication typically ends up in breastmilk, and whether the medication is considered acceptable to give directly to a baby.

Many cough and cold medications come in combination products. In some cases, you end up taking extra medications for a symptom you do not have! Also, some medications act together to make more problems. For example, decongestants and antihistamines taken together may have extra ability to reduce milk supply. Taking a single medication at a time lets you be sure you are using only the one that you need.

Consider whether your symptoms need medical treatment...is it worth the potential exposure to your baby, especially since many medications have not been studied very well in breastfeeding? Non-medication strategies like a humidifier, warm shower or bath, or nasal irrigation with saline may be comforting.

Most vitamins or minerals taken over the recommended daily allowance (RDA) have not been studied very well in breastfeeding. Herbal agents are also poorly studied, which makes it difficult to tell if they are hazardous or not in breastfeeding. In general, supplements like this should be avoided.

Fever and Body Aches

Common medications to treat these symptoms are **acetaminophen** and **ibuprofen**. Both end up in breastmilk in only small amounts and can be given directly to babies. When used as recommended on the label these medications are unlikely to harm your baby.

Aspirin is not given to babies because it may cause bleeding or a condition called Reye syndrome (swelling of the brain). Very little aspirin gets into breastmilk, but to be on the safe side you may want to be cautious about taking it when you are breastfeeding unless it is prescribed for a medical condition and your baby's health provider agrees with use.

The Sniffles (medications that dry up your nose like decongestants and antihistamines)

Over-the-counter nasal decongestants fall into two categories: oral and topical/spray.

Oral (pill) decongestants include **pseudoephedrine** and **phenylephrine**. These medications are not given directly to babies and can make them jittery and sleep poorly, and may also reduce your milk supply.

Oral (pill) antihistamines include **chlorpheniramine**, **doxylamine**, and **diphenhydramine**. Varying amounts get into milk; they can make your baby sleepy or irritable, and may reduce your milk supply. They are also not medications given directly to babies.

Topical (spray) decongestants such as **oxymetazoline** have not been studied very well in breastfeeding. However, they are not very well absorbed from your nose, and thus not much is likely to get into your milk.

Cough

The most common over the counter cough medications are **dextromethorphan** (cough suppressant) and **guaifenesin** (loosens up mucous). Not much dextromethorphan gets into milk; it is not known if guaifenesin gets into your milk. Some cough syrups contain alcohol, which would be a hazard for your baby. Be sure to check your label.

Cough lozenges may just have sugar and flavoring, or may include honey, menthol, zinc, or herbal agents. Read your label before you take the medicinal ones since many components have not been studied very well in breastfeeding.

We hope you feel better soon, and if you have further questions or notice side effects in your baby that you suspect may be related to a medication you are taking, speak with your baby's healthcare provider.

Questions? Call 866.626.6847 | Text 855.999.3525 | Email or Chat at [MotherToBaby.org](https://www.MotherToBaby.org).

Disclaimer: MotherToBaby Fact Sheets are meant for general information purposes and should not replace the advice of your health care provider. MotherToBaby is a service of the non-profit Organization of Teratology Information Specialists (OTIS). Copyright by OTIS, February 23, 2023.

Breastfeeding: Treating Cough and Cold Symptoms

Let's face it, being pregnant can be hard, having a baby is without a doubt hard, and taking care of a newborn might be even harder, especially if it's your first. Even when it feels like you are doing a great job, there is always someone who can't stop suggesting ways to make things better.

Think about it, I am sure you have heard...

"If you do this _____, your baby will sleep through the night."

"I had 4 kids and that has never happened to me..."

"You need to stop drinking coffee if you want to breastfeed."

"You should consider changing your diet, it might help you lose some of the baby weight."

Sound familiar? That someone can be your parents, siblings, partner, the in-laws, grandparents, extended family members, or some random person/influencer online. With no shame, those are probably good ideas that may have worked for them whenever you had their own kids but it might not be the same for you and that is okay. Every experience is different, and no kid is the same.

When I was pregnant, I felt so great! I was on top of the world (ignoring the weight gain, and the shortness of breath). Really, no joke. Receiving compliments everywhere I went felt awesome!

But now that I have my baby... it sometimes feels like everyone wants me to do more and do "better". Culture and ethnicity play a huge part in how we approach parenthood but let me tell you... being a Latina woman holds no exception.

So, let's talk about some myths among the Latino community.

#1, Adding a little bit of cereal to the baby's bottle will help him/her sleep better, especially at night.

Fact or Myth?

This is true or a fact but not necessarily for a healthy standpoint. You may notice your baby sleeping for longer periods of time but it's because they are being overfed and it will require more effort from the digestive system to break down this heavy meal. Think about that time when you ate way more than what you were used to. You might have felt tired and opted for a nap; the same thing happens to your baby. Remember that babies need to eat every 2-3 hrs., and sometimes earlier if you are exclusively breastfeeding (since breastmilk is easier to digest, compared to formula).

So, next time you hear this, please, do not add any cereal to your baby's bottle unless your pediatrician instructs you to do so. You can read more about "Boosting your Breastmilk" here:
<https://mothertobaby.org/baby-blog/boosting-milk-for-baby-the-supply-demands-of-breastfeeding/>.

#2 You should start a liquid diet once you have your baby to produce more breastmilk and lose the weight gained.

Fact or Myth?

Myth! You have spent 9 months "eating for two" and now they want you to stop eating and go on a liquid diet! This is not only a myth, but it could also be harmful to you, especially if breastfeeding is a goal of yours. To successfully produce enough breastmilk to feed your baby, your body needs to be well nourished. The goal is to be hydrated and eat a variety of foods from each food group [carbohydrates, proteins (vegetable or animal sources), vegetables, fruits, and dairy] and to nurse your baby as often as they want/need (on demand). So please, drink lots of water but also eat solid foods, unless your healthcare provider instructs you to do something else.

PS: If you want to know more about nutrition, talk to a registered dietitian. They will work with you to help achieve your goals. Read more about other blogs on nutrition at: <https://mothertobaby.org/category/food-beverages/>.

#3 Eating eggs after delivery will make your breastmilk smell bad and your baby won't latch.

Fact or Myth?

Yet, another myth! All foods have different mechanisms of digestion, and although some take longer to digest, it is a

myth that some residues will affect the smell of your breastmilk. Same as above, if you are a fan of eggs and you have been eating them throughout the pregnancy, there is no conclusive evidence to suggest that you should stop eating them after delivery. On the contrary, studies show that the earlier we expose our babies to the Big 8 food allergens (milk, eggs, fish, crustacean shellfish, tree nuts, peanuts, wheat, and soybeans; with sesame being the 9th added), the better likelihood there is that this may reduce their chances of having a food allergy later in life. So once again, it is safe to say you can continue drinking your water and eating your meals, bearing in mind the importance of practicing **food safety** [eating fully cooked foods, with an internal temperature of 160°F, for the eggs] Learn more about food safety here: <https://mothertobaby.org/fact-sheets/eating-raw-undercooked-or-cold-meats-and-seafood/>,

#4 Drinking coffee while breastfeeding will make your baby fussy.

Fact or Myth?

This is a fact but when the intake of caffeine surpasses 300mg a day. Remember that being fussy is not a diagnosis, it is a symptom of some underlying problem. Fussiness and gassiness are very common in babies since they are not moving. If you are breastfeeding and your baby is getting fussy very often, contact your healthcare provider. But rest assured that one cup of brewed coffee a day will not make your baby fussy as it is typically around 137 mg of caffeine. More often than not, there are other reasons why your baby might be fussy such as: excessive sugar intake, complex carbohydrates intake (which are harder to break down in your digestive system), among many other reasons. To learn more about caffeine intake during the pregnancy or while breastfeeding, check out our Fact Sheet at: <https://mothertobaby.org/fact-sheets/caffeine-pregnancy/> .

Now that we have talked about some myths among our community, I hope we can spread the word and you may feel more empowered to make your own decisions based on what we have discussed today.

Being a Latina mom living in the United States has given me a different perspective but no matter where I am, I have heard these myths about motherhood more often than I would like to admit. Hopefully debunking and explaining some of these myths will help you and others understand that at the end of the day, you are more than capable of making good choices and you know what works best for you and your baby.

Take care of yourself so you can take care of that little person you just had. At MotherToBaby we are here to help you, just one call, text, chat, or email away.

Questions? Call 866.626.6847 | Text 855.999.3525 | Email or Chat at [MotherToBaby.org](https://www.MotherToBaby.org).

Disclaimer: MotherToBaby Fact Sheets are meant for general information purposes and should not replace the advice of your health care provider. MotherToBaby is a service of the non-profit Organization of Teratology Information Specialists (OTIS). Copyright by OTIS, February 23, 2023.

Breastfeeding: Treating Cough and Cold Symptoms

By Kirstie Perrotta, MPH, MotherToBaby California and Lorrie Harris-Sagaribay, MPH, MotherToBaby North Carolina

With schools back in full swing, fall activities underway, and children gathered once again in classrooms and other indoor settings, parents—including those who are pregnant—have renewed questions about COVID-19 and COVID-19 vaccines. MotherToBaby is seeing an increase in questions from pregnant women who want to protect themselves and their families as much as possible. Although more and more women are confident about getting vaccinated against COVID-19 in pregnancy, we continue to get questions about vaccine safety, as well as inquiries about eligibility for the updated boosters. MotherToBaby has teamed up with the Centers for Disease Control and Prevention (CDC) to give you the latest about vaccination for those who are pregnant and for children.

What is the current impact of COVID-19 and pregnancy?

At this point in the pandemic, we know the importance of taking steps to help prevent a COVID-19 infection in pregnancy. Research has shown that women who are pregnant have a higher chance of becoming very sick, being admitted to intensive care, and needing to be put on a ventilator if they get COVID-19. Some studies have reported a slightly higher chance of death. Researchers have also found increased chances of adverse effects on the pregnancy itself, including preterm delivery, stillbirth, and complications such as preeclampsia.

The good news is, a recent study found that pregnant women who received two doses of an mRNA COVID-19 vaccine had lower rates of stillbirth than those who were unvaccinated. Furthermore, those who also received a booster had lower rates of infection, hospitalization, and pregnancy complications related to COVID-19 than those who received only the two primary doses. This finding is reassuring that staying up to date on the vaccines provides good protection in pregnancy in case of a breakthrough infection.

Why should women who are pregnant and those trying to expand their families consider getting vaccinated against COVID-19?

Vaccination is the best way to protect yourself against getting seriously ill, being hospitalized, and dying from COVID-19. This is true for everyone, but especially for those who are pregnant and others who are at higher risk of

complications from COVID-19. Getting vaccinated during pregnancy has the added benefit of passing antibodies to the developing baby, which has been shown to lower the baby's chances of infection or hospitalization with COVID-19 during the first few months of life.

For those planning a pregnancy, the preconception period is a great time to become up to date on recommended immunizations, including COVID-19 vaccines. This helps ensure that future pregnancies will start out as protected as possible from COVID-19 and other vaccine-preventable illnesses. CDC has helpful information here about vaccines before pregnancy: <https://www.cdc.gov/vaccines/pregnancy/vacc-before.html>.

What are the long-term effects on the baby when a person gets a COVID-19 vaccine during pregnancy?

It will take time to follow the children of women who were vaccinated in pregnancy to be able to answer this question with data. However, based on what is known about how these and other vaccines work, getting a COVID-19 vaccine during pregnancy is not expected to cause long-term problems for the child. In fact, a pregnancy that stays up to date on the vaccines is more protected and less likely to have complications from COVID-19 that could affect a child's future growth and development, such as preterm delivery. In addition, studies have demonstrated antibody protection for the infant following vaccination during pregnancy. And, of course, vaccination during pregnancy will continue to protect the parent after delivery while they are caring for their newborn.

Should women who are pregnant get an updated booster?

It is common for vaccines to be updated over time to give better protection against new variants spreading in the community, just as the flu shot is updated every year to provide the best protection against current strains of influenza. The updated COVID-19 booster, which gives added protection against the Omicron variant, is also referred to as bivalent. Women who are pregnant should receive this latest booster for the most up-to-date protection against COVID-19. CDC and the American College of Obstetricians and Gynecologists strongly recommend that pregnant women stay up to date with COVID-19 vaccines, including booster doses.

Like most other people, women who are pregnant are eligible for the updated booster if they have completed a primary COVID-19 vaccine series and it has been at least two months since their last dose (primary or booster). The updated booster can be given in any trimester of pregnancy. Anyone who has had a recent COVID-19 infection can consider delaying the booster by up to 3 months from the time their symptoms started or they tested positive.

Are COVID-19 vaccinations recommended for breastfeeding?

Studies have found that the components of mRNA COVID-19 vaccines are unlikely to enter the breast milk, and no serious side effects have been reported for the breastfed baby. In rare cases, there may be a temporary reduction in milk supply when a person gets an mRNA COVID-19 vaccine, but reassuringly, supply is expected to return to normal within a day or two. In more good news, antibodies against the virus that causes COVID-19 have been found in the breast milk of women who have been vaccinated with mRNA COVID-19 vaccines while breastfeeding. This is a promising finding, although more research is needed to know how much and for how long these antibodies might protect a breastfeeding child against the virus.

CDC, the Academy of Breastfeeding Medicine, and the American Academy of Pediatrics recommend that women who are breastfeeding stay up to date with COVID-19 vaccines, including booster doses.

What resources help pregnant women make informed decisions about protecting themselves and their families against COVID-19?

For questions about COVID-19 vaccines and other exposures during pregnancy and breastfeeding, talk with your healthcare provider or contact a MotherToBaby specialist. You can find MotherToBaby resources on COVID-19 and COVID-19 vaccines at <https://mothertobaby.org/pregnancy-breastfeeding-exposures/covid-19/>.

For guidance surrounding kids, we'll turn to Leandris C. Liburd, PhD, MPH, the Associate Director for Minority Health and Health Equity for the Centers for Disease Control and Prevention (CDC).

Questions? Call 866.626.6847 | Text 855.999.3525 | Email or Chat at [MotherToBaby.org](https://mothertobaby.org).

Disclaimer: MotherToBaby Fact Sheets are meant for general information purposes and should not replace the advice of your health care provider. MotherToBaby is a service of the non-profit Organization of Teratology Information Specialists (OTIS). Copyright by OTIS, February 23, 2023.

Breastfeeding: Treating Cough and Cold Symptoms

by Sarah Obican, MD, MotherToBaby President

Though I wish I didn't remember the day well, I do. I was a maternal fetal medicine fellow in NYC and I was sitting with

my two beautiful co-fellows. When I say my co-fellows were beautiful, I mean that inside and out. We were an odd pairing of three musketeers. Young, bright, professional women, training to take care of women with high-risk pregnancies... and all three of us were pregnant. It was completely unplanned and highly unusual for all three of us to conceive, all within a few short weeks of each other. But there we were one day, sitting at our desks, talking about our individual research projects and occasionally interjecting in each other's conversations with excitement about our future babies. I loved my two colleagues so much, and I was so excited to imagine that we would follow each other's careers and see our children grow up, all similar in age.

In the middle of this conversation, something made me just get up and say to them "I'll be right back!" I still don't know what made me do it. I had a feeling hard to describe, but it made me walk over to our ultrasound unit and ask my sonographer colleague to please do an ultrasound.

I was on the examining table within minutes. But her silence after she put the probe down on my ultrasound gooped-up belly felt like an eternity. Another sonographer came into the room. I knew. That's when the world went dark.

Now, I am physician and I cannot explain this. For a few moments, quite literally, the bright NYC day, the room, the people in the room, went completely dark. I couldn't see. I didn't lose consciousness, but I couldn't see. In my career, I sadly had to care for countless women who went through a miscarriage and in that darkness, I wondered if they had experienced the same. A few moments later I was back in the ultrasound room, now with an overcoming wave of sadness which made me wish I was in the numbing darkness again.

The American College of Obstetricians and Gynecologists estimates that 26% of all pregnancies end in a miscarriage and a significant proportion of those are in already clinically recognized pregnancies (when the pregnant woman already knows she is pregnant).

Miscarriage vs. Abortion

The words miscarriage and abortion are often used interchangeably. For example, a missed abortion in the world of obstetrics means that pregnancy stopped naturally and that there is no heartbeat or if early enough in the pregnancy, that there is no continuation of fetal growth or development. These pregnancies can pass naturally with bleeding or can be aided by a physician by giving medication or performing a procedure. During this time, there is a lot in terms of discussion of possible contributing factors including abnormal genetics and counseling on recurrence for the next pregnancy. It's a tough, sensitive time for patients. I know it from both sides.

Ectopic Pregnancy

Sometimes desired pregnancies present themselves as ectopic pregnancies. An ectopic pregnancy is when an already fertilized egg implants and begins to grow outside of the uterus in an area that cannot adequately support the pregnancy. Most of the ectopic pregnancies (>90%) occur in the fallopian tube, but no matter where the pregnancy implants, it can be life threatening for the pregnant woman. This is because the location in which the ectopic pregnancy has implanted cannot grow, expand and adequately support the pregnancy nutritionally and can result in the structure rupturing and causing internal bleeding. While all miscarriages can feel devastating, an ectopic pregnancy is an emergency that requires immediate treatment by a physician. Depending on the size and development of the ectopic pregnancy and the patient's symptoms, the ectopic pregnancy can be treated with medication or by surgery. This too gives a great sense of loss for patients because often these pregnancies were highly desired.

It is important to note that being treated for a miscarriage or an ectopic pregnancy either by the use of medications or

surgery is not considered a termination. As a high-risk obstetrician, I know that providing great medical care for a miscarriage, an ectopic pregnancy or providing access to desired abortion care is essential for the pregnant woman's health and safety.

Shedding Light on the Darkness

With my personal journey of years of infertility and in vitro fertilizations, there are not many positives from that sunny day in NYC. However, that personal darkness shed light on all of what my patients in similar situations had to go through. I talk about my history openly, if asked. When appropriate, I share with my patients about my loss and about infertility. I am reminded by my patients that we have to speak more about these human experiences. To normalize them, to not feel alone. As for the experience of that day, I am thankful for that knowledge and when I have to be the first to tell my patient that she just had a pregnancy loss, I get close to her and I hope that my words, my actions and my demeanor show them what I am thinking inside.... I see you and I've got you.

References/Resources

<https://www.acog.org/advocacy/abortion-is-essential>

<https://www.acog.org/advocacy/facts-are-important/understanding-ectopic-pregnancy>

<https://www.ncbi.nlm.nih.gov/books/NBK532992/#:~:text=The%20American%20College%20of%20Obstetricians%20and%20Gynecologists%20%28ACOG%29,early%20pregnancy%20loss%20occurs%20in%20the%20first%20trimester>

Questions? Call 866.626.6847 | Text 855.999.3525 | Email or Chat at [MotherToBaby.org](https://www.MotherToBaby.org).

Disclaimer: MotherToBaby Fact Sheets are meant for general information purposes and should not replace the advice of your health care provider. MotherToBaby is a service of the non-profit Organization of Teratology Information Specialists (OTIS). Copyright by OTIS, February 23, 2023.

Breastfeeding: Treating Cough and Cold Symptoms

It was late on a Tuesday when a chat came in from Dr. Rodriguez. “My patient is taking a medication for epilepsy. She is planning a pregnancy and I’ve seen from some sources she may need to take more folic acid to help prevent birth defects. Does she need to be on a higher dose?” As teratogen information specialists, we receive many inquiries regarding folic acid; and it was understandable why this healthcare provider was confused as the guidance isn’t exactly straightforward.

What is folic acid?

Folic acid is the lab made form of folate. Folate is a B9 vitamin. Folate and folic acid help the body create new cells and can lower the chance of having a child with a class of birth defects called neural tube defects, which are problems with the brain and spinal cord. The neural tube forms very early in pregnancy (around 4 to 6 weeks after the first day of the last menstrual period), so it’s important that any woman who could become pregnant get enough folic acid at least one month **BEFORE** she gets pregnant. In the United States many of our foods, such as breakfast cereal, bread, pasta, and rice are fortified with folic acid, which meant the vitamin has been added to the food. According to the Centers for Disease Control and Prevention (CDC), folic acid fortification programs have led to a 35% decrease in the rate of neural tube defects! We also get folate, which is the naturally occurring form of Vitamin B9, from foods like dark leafy greens, beans, citrus fruits, and nuts. However, only about 50% of this form is bioavailable (able to be absorbed and used by the body) so additional intake, in the form of a supplement, is recommended by organizations like the CDC and National Institutes of Health (NIH).

How much is needed?

The CDC recommends that all women of reproductive age get at least 400 mcg (0.4 mg) of folic acid each day. Once pregnant, organizations like The NIH and the United States Preventative Services Task Force (USPSTF) recommend that women who are pregnant get 600 to 800 mcg (0.6 to 0.8 mg) of folic acid per day. This amount can usually be met by taking an over-the-counter prenatal vitamin; a higher amount is not recommended for most pregnant women.

Women who have previously had a pregnancy affected by a neural tube defect (NTD) should take a higher dose of folic acid if they are planning to become pregnant again. The CDC and the American College of Obstetricians and Gynecologists (ACOG) recommends 4,000 mcg (4 mg) per day for these individuals. This higher dose should be started at least one month before becoming pregnant and should be continued through the first three months of pregnancy.

So what about Dr. Rodriguez’s patient who was on an anti-epileptic drug (AED) for her seizure disorder? Many, but not all, medications in the AED class are known as “folic acid antagonists.” This means that they can interfere with how the body absorbs and uses this important vitamin. If someone becomes pregnant while taking a folic acid antagonist, they may have lower levels of folic acid in their body and their pregnancy could be at higher risk of neural tube defects. That said, there is no great research that shows that taking extra folic acid would lower the risk of NTDs for women taking folic acid antagonists. So, should a woman taking an AED stick with the 400 mcg per day that is already recommended for everyone, or take more just in case it could be helpful?

Let's look at the current professional recommendations:

- The American Academy of Neurology and the American Epilepsy Society **guidelines** state that all women of childbearing age, with or without epilepsy, should be supplemented with at least 400 mcg (0.4 mg) of folic acid per day prior to conception and during pregnancy. They go on to say there is not enough data to know if taking folic acid at doses higher than 400 mcg offer greater protective benefits for women on AEDs.
- The American College of Obstetricians and Gynecologists (ACOG) **recommends** 4000 mcg (4 mg) of folic acid per day for individuals at increased risk of having a baby with a NTD, which includes women with seizure disorders.
- The Centers for Disease Control and Prevention (CDC) only **recommends** a higher dose of folic acid for those with a history of a pregnancy affected by a NTD.
- The U.S. Department of Health and Human Services (Office of Women's Health) **recommends** talking to your doctor to determine the right dose of folic acid if you are taking a medication for epilepsy.

Clear as mud, right? The current consensus seems to be that there is no consensus. Some groups recommend a higher dose while others do not. In situations like this where there is no clear consensus from the professional groups, it comes down to weighing the risks vs. benefits. The risks include the fact that higher doses of folic acid are not well studied in pregnancy, could mask a B-12 deficiency, and may actually make some medications less effective. The benefits of taking more are theoretical (not proven). A higher dose of folic acid **might** be protective in preventing birth defects while on a folic acid antagonist, but there is not enough research to know if this is true. Ultimately, much more data will be needed to come up with clear guidelines for women with epilepsy.

Because Dr. Rodriguez's patient was on carbamazepine, a folic acid antagonist that is associated with a higher chance for neural tube defects, she decided that she would have a thorough discussion of the risk vs. benefits of taking a higher dose of folic acid with her patient before she became pregnant. Dr. Rodriguez was glad she hadn't missed any overarching recommendations for women who need to take medication to control their seizure disorders during pregnancy. She ended her chat by saying: "It can be a challenge to keep up to date with all the recommendations. I'm so glad to have access to MotherToBaby to be able to ask questions like this."

MotherToBaby specialists are always happy to review the latest data and professional recommendations with healthcare providers and patients alike. If you have questions about folic acid, epilepsy medication, or any other exposures in pregnancy or lactation, please feel free to get in touch.

Questions? Call 866.626.6847 | Text 855.999.3525 | Email or Chat at [MotherToBaby.org](https://www.MotherToBaby.org).

Disclaimer: MotherToBaby Fact Sheets are meant for general information purposes and should not replace the advice of your health care provider. MotherToBaby is a service of the non-profit Organization of Teratology Information Specialists (OTIS). Copyright by OTIS, February 23, 2023.