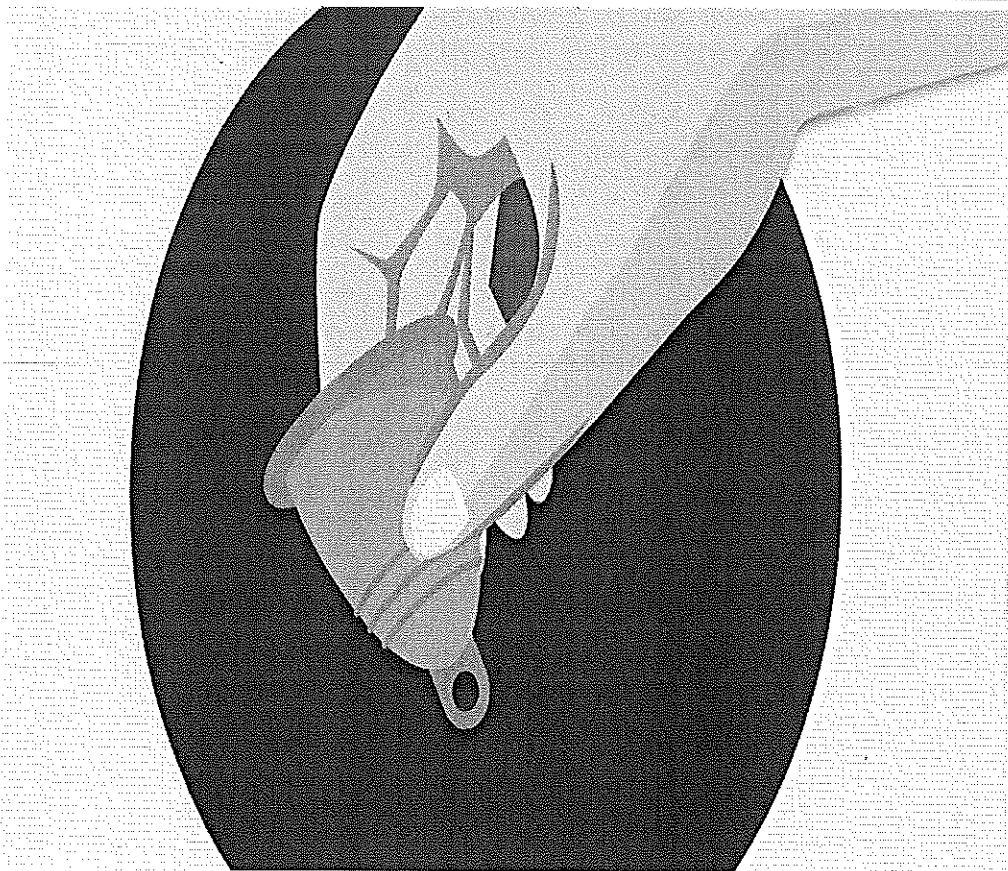


Menstrual Cup Linked to Toxic Shock Syndrome, New Study Finds

Tampon use has long been associated with this rare disease, but this alternative may carry the same risks

By Hallie Levine
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If you're of a certain age, you may remember all the news reports about toxic shock syndrome (TSS), a rare but potentially deadly condition caused by a type of bacteria that produce toxins. Though it was first discovered in 1978, it became a household word in

1980, when 812 cases were reported among women who used tampons during their periods.

These numbers dropped swiftly over the years, thanks to changes in manufacturing practices (superabsorbent tampons were thought to be the cause). By 1989, only 61 cases of TSS were reported, and in 2016, just 40.

But TSS is still a threat. There was an outbreak of five cases in Michigan in 2016, for example, and last November actress and model Lauren Wasser made headlines when she revealed that she'd lost her leg from toxic shock syndrome stemming from tampon use.

In recent years, menstrual cups—flexible cups that are inserted into the vagina during a period to collect menstrual blood—have been touted as a safer alternative to tampons. Now, a new study published in the journal *Applied and Environmental Microbiology* suggests that menstrual cups may also raise the risk of TSS.

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What the Study Found

The study authors tested 15 different tampons and menstrual cups in a laboratory to see whether they promoted the growth of *Staphylococcus aureus*—the bacteria behind most cases of toxic shock syndrome—as well as the toxin that the bacteria produces, called TSST-1. The toxin is what triggers an inflammatory cascade of chemicals in the body that result in fever, low blood pressure, skin rash, and, in the most severe cases, organ failure.

Both tampons and menstrual cups create a breeding ground for *S. aureus* because they introduce oxygen into the vaginal canal, and in the presence of oxygen, *S. aureus* can multiply to high enough levels to produce the toxin, says Patrick Schlievert, Ph.D., chair of microbiology at the University of Iowa's Carver College of Medicine.

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The shape and volume of menstrual cups, however, allows more oxygen to enter, says study author Gérard Lina, M.D., Ph.D., president of the French Society for Microbiology. The bacteria then build up on the cup, which makes it harder to sterilize.

“People believe that menstrual cups can’t cause toxic shock syndrome, but unfortunately, that is wrong,” says Lina, adding that he has observed two cases in France during the past three years. In 2015, an article published in the Canadian Journal of Infectious Diseases and Medical Microbiology reported on a confirmed case of TSS from a menstrual cup.

All the tampons in the test also promoted the growth of *S. aureus* and its toxin. But contrary to past research, Lina and his team found that tampons made of organic cotton, which were thought to carry a lower risk of TSS than other types, produced more of the toxin than tampons made of cotton and rayon, cotton and viscose, or viscose alone.

“The structure of the all-cotton tampons was less stable than the others,” says Lina, explaining that tampons with more structure may be less likely to promote the growth of *S. aureus* and the toxin because they allow less oxygen in.

Consumer Reports reached out to several menstrual-cup manufacturers but has not heard back from any. One company, Lunette, says on its [blog](#): “Menstrual cups have been a trusted period care product for decades. In fact, globally only 2 cases of TSS relating to menstrual cup use have been reported and this was due to very prolonged use (inserted for 7 days rather than the recommended 12 hour maximum)... Like with any period care product you cannot have zero risk of TSS. But a clean, properly-used menstrual cup means the chances are very small.”

Who's Most Susceptible

S. aureus is a very common bacteria—up to half of all healthy adults and children carry it on their skin, or in their vagina or rectum, without ever developing any symptoms.

But during a woman's period, the warm, moist environment encourages the bug to breed, as does tampon or menstrual cup use.

When enough *S. aureus* develops, it begins to secrete the toxin TSST-1. But again, this isn't a problem for most women. “My research has shown that about 80 percent of women naturally make antibodies to TSST-1, so their bodies are able to fight against it,” Schlievert says.

But for the 20 percent who can't, TSST-1 can grow unchecked, reaping huge damage. “That's why if you

get toxic shock syndrome once, we think you're more susceptible to recurrences," he says.

This may also be one reason younger women, especially adolescents, appear to be more susceptible to TSS. "The presence of these antibodies increases with age," says Jennifer Gunter, M.D., an OB-GYN in the San Francisco Bay Area who has covered the topic of TSS in depth on her blog.

Teens are also more likely to wear two tampons at a time and then forget to take one out, Schlievert says. If you have a teenager who wants to wear a tampon or a menstrual cup, it's important to go over the risks with her and make sure she's using it correctly.

Protecting Yourself

If you currently use a menstrual cup or tampons, there's no need to switch to pads. "It's important to remember that toxic shock syndrome is incredibly rare—I have never seen any cases, and I've been in practice for almost four decades," reassures Mary Jane Minkin, M.D., clinical professor of obstetrics and gynecology at Yale University School of Medicine.

But if you do use either, it's wise to still take some precautions. Here's what our experts suggest.

Use the lowest-absorbency tampon you can. While the French study seemed to suggest that certain

materials may be safer than others, “it really comes down to absorbency,” Schlievert says.

However, you don’t want to use a tampon so small that you’re soaking through and need to change it more frequently than every 4 hours. “When you do this, you introduce more oxygen into your vagina that can contribute to both *S. aureus* and toxin growth,” Schlievert says. A good rule of thumb is to change your tampon every 4 to 8 hours.

Consider the menstrual cup material. In the French study, *S. aureus* was less likely to stick to cups made from TPE (thermoplastic elastomer) than to those made from silicone. But regardless of which one you use, Lina recommends washing your hands before inserting and using it for only about 6 hours at a time.

While some menstrual cup manufacturers say it’s okay to simply remove it and rinse it off with soap and water, Lina’s study found that this method doesn’t remove bacteria. Instead, Lina suggests sterilizing the cup in boiling water between each use for 5 to 10 minutes.

“I think it’s a good idea for women to purchase two or three menstrual cups, so they have time to sterilize a used one before reinserting it again,” Gunter says.

Be careful with diaphragms. TSS still occurs mostly among tampon users, but it has been linked to diaphragm use during your period, so you may want to use another contraceptive method during this time.

And recently, there have been reports of women using makeup sponges during their periods as a way to have “bloodless” sex. “This is a big no, since the polyester foam can promote the growth of *S. aureus*,” Gunter says.

Be alert to signs of TSS. The two biggest red flags are a sudden high fever, and dizziness when changing from a sitting position to standing, which is caused by hypotension, or sudden low blood pressure, Schlievert says.

Other symptoms include nausea and vomiting, and a rash resembling a sunburn, particularly on your palms and the soles of your feet, as well as muscle aches, confusion and headache.

If you experience any of these, stop using the tampons or menstrual cups and call your doctor immediately, and be sure to tell him or her that you have been using one of these products.

“I had a teenage patient referred to me three years ago after an emergency room visit with a high fever, flulike symptoms, and a rash,” Schlievert says. “But it took several days and a return trip to the hospital before she was sent to me. They hadn’t even thought to check for toxic shock syndrome initially. It wasn’t even on their radar. Needless to say, she and her family were shocked when she was diagnosed with TSS.”