

How safe is your baby's medicine bottle?

Infant Tylenol and other liquid acetaminophen products have a new safety feature. Consumer Reports put it to the test.

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Drug accidents send more kids under the age of 6 to the emergency room than car crashes. About 10,000 cases a year involve liquid medications, such as cough and cold medicines, as well as infant and child versions of the pain reliever and fever reducer [acetaminophen](#) (Tylenol and generic versions). It takes only a moment of caregiver inattention for a curious little one to grab a medicine bottle to try to get to the syrupy liquid inside.

In addition to the child-resistant caps required by law, manufacturers are voluntarily designing some bottles to make it harder for kids to get to the contents. These new bottles use a small device called a flow restrictor to reduce how much medication can be extracted from the bottle—a step we enthusiastically applaud.

But different companies use different approaches. Is one more effective than another? To find out, we tested flow restrictors on more than 30 liquid infant acetaminophen bottles that we found on drugstore shelves across the U.S. And we [shared those results with ProPublica](#), an independent, nonprofit newsroom, as part of its ongoing investigation into acetaminophen safety. (You can read their story [here](#).)

Our tests revealed that while all the designs make it harder for kids to get to the liquid medicine, some work better than others. And that McNeil, maker of market-leading Tylenol products, is not one of the manufacturers at this time using the flow restrictor approach we found most effective in our testing. In contrast, a number of other brands do, including PediaCare products, and a store brand, DG Health, found at Dollar General Stores.

Consumer Reports and ProPublica contacted McNeil Consumer Healthcare, makers of Tylenol products, with questions about its test results. The company did not answer why it does not use the more effective flow restrictor. But it said in a statement that the company is encouraged by the positive feedback it has received so far for its flow restrictors on infant and children's liquid acetaminophen products. And, that it is in the process of determining if it will extend the use of this safety device to other products.

"While we applaud manufacturers for voluntarily placing these restrictors in liquid acetaminophen products, we think the more effective valve should be adopted industry-wide," said Doris Peter, Ph.D., associate director of the Consumer Reports Health Ratings Center. "And, that these more effective flow restrictors should be used on all liquid medications for adults and children, including cough and cold medications."

How we tested

Acetaminophen is a [leading cause](#) of accidental overdoses because it is so common and because, while it's safe at recommended doses, it doesn't take a lot to prove toxic. Ingesting the equivalent of more than five doses in 24 hours can cause severe liver damage. Overdose can even result in death.

In response to those dangers and to improve dosing accuracy, manufacturers added flow restrictors as an extra layer of protection on infants' liquid and some children's liquid acetaminophen products. These devices fit into the neck of a medicine bottle to slow the release of liquid and are helpful, according to tests by the Centers for Disease Control and Prevention (CDC) and the Georgia Poison Center. In [studies](#) that examined the ability of young children to access liquid medicine in bottles, the CDC group concluded that children could get to the liquid contents much more easily in bottles without flow restrictors, compared with bottles that used them.

But we found that there are currently no standards for the design of flow restrictors and no public data on how well different types work. (Consumer Reports has since joined a task group of the American Society for Testing and Materials International to help develop voluntary design standards for flow restrictors.)

So we collected as many different brands and sizes of liquid acetaminophen products in bottles as we could find and started testing.

Our tests duplicated the ways that a child would be most likely to remove medicine from the bottle—by squeezing, shaking, or sucking on it. For reference, we measured the physical abilities of a 4-and-a-half year old boy, near the top of the age range that child-resistant packaging is typically designed to protect. Once we determined the strength with which the young boy could attack the bottle, we applied those forces using lab equipment in a standardized way across all the products.

What we found

Although the products we purchased did not identify on the packaging what kind of flow restrictor they used, the flow restrictors fell into two basic categories.

Open flow restrictors consist of a plastic disc with a small hole in the center. This design prevents an unattended child from quickly emptying the contents of the bottle, but still makes it easy for a caregiver to draw up the recommended dose through a syringe or squeeze it into a dosing cup. (The recommended dosing tools are included with the packaging.)

Closed flow restrictors also consist of a plastic disc, but also include an elastic valve in the small hole that opens when the tip of the syringe is inserted in the bottle, then closes when it's removed.

Our tests revealed that closed restrictors worked much better. While all the restrictors will prevent a child from simply pouring out the medicine, the closed versions either greatly reduced or completely eliminated the amount of liquid that a young child could squeeze, shake, or suck out of a bottle. The picture at right shows the liquid that came out of the Tylenol bottle, which has an open flow restrictor, when it was squeezed; in comparison, no liquid came out of the PediaCare bottle, which has a closed flow restrictor, when it was squeezed.



The flow restrictors on products such as PediaCare reduced or eliminated liquid escaping.

All of our preferred brands listed in the table below used the closed design.

What parents should do

The first line of defense against accidental overdose in children is to keep all medicines and vitamins out of sight and out of reach. Always use the dosing cup or oral syringe that comes with the medicine. A kitchen spoon or a different dosing tool may hold the wrong amount of medicine. The CDC suggest these other tips:

- Pick a place your children cannot reach to keep medicines.
- Put every medicine away every time you use it.
- Always relock the safety cap every time you open it.
- Teach your children about medicine safety.
- Tell guests about medicine safety.
- Program the Poison Help number into your phone: **1-800-222-1222**.

Products with preferred safety feature (closed flow restrictors)

These products had the flow restrictor type that worked best in our tests, which greatly reduced or eliminated the amount of liquid a young child could get from the bottle. Listed alphabetically.

Brand	Product name	Size, Fluid Oz.
DG Health (Dollar General) ¹	Infants' Pain & Fever Relief	2
Family Wellness (Family Dollar)	Infants' Suspension Liquid	1
Little Remedies	Infant Fever/Pain Reliever	2
PediaCare ²	Fever Reducer Pain Reliever	2
Safeway ¹	Infants' Suspension Drops	2

1. DG Health and Safeway have a syringe that must be snapped into place; in our informal usability tests 8 of 9 adults were not able to insert the syringe without instructions.
2. PediaCare also offers liquid acetaminophen products in 0.25 fluid ounce single-dose packets.

Other products tested (open flow restrictors)

All of the flow restrictors on these products reduced the amount of liquid released compared to open bottles. But they did not work as well as closed restrictors. Listed alphabetically.

Brand	Product Name	Size, Fluid Oz.
CVS	Infants' Pain & Fever	1
CVS	Infants' Pain & Fever	2
CVS	Children's Pain & Fever	4
DG Health (Dollar General)	Infants' Pain & Fever	1
DG Health (Dollar General)	Children's Pain & Fever	4
Equaline	Infants' Pain & Fever	2
Equate (Walmart)	Infants' Pain & Fever	1
Equate (Walmart)	Infants' Pain & Fever	2
HEB	Pain & Fever Infants	2
Kroger	Infants' Pain & Fever	2
Rite Aid	Infants' Fever Reducer & Pain Reliever	1
Rite Aid	Infants' Fever Reducer & Pain Reliever	2
Rite Aid	Children's Fever Reducer & Pain Reliever	4
Rite Aid	Children's Fever Reducer & Pain Reliever	5
Safeway	Infants' Suspension Liquid	2
Smart Sense (Kmart)	Infants' Pain & Fever	2
Smart Sense (Kmart)	Children's Pain & Fever Oral Suspension	4
Top Care	Infants' Pain & Fever	1
Top Care	Infants' Pain & Fever	2
Tylenol	Infants'	1
Tylenol	Infants'	2
Tylenol	Children's Pain & Fever	4
Up&up (Target)	Infants' Pain and Fever	1
Up&up (Target)	Infants' Pain and Fever	2
Well at Walgreens	Infants' Pain & Fever	1
Well at Walgreens	Infants' Pain & Fever	2

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