



# Can You Believe What the Media Says About BPA?

By Steve Hentges

For many years, bisphenol-A (BPA) has been a popular research topic in the scientific community, and that scientific interest regularly spills over into the popular media. The headlines almost scream the results of the latest study with claims that BPA causes virtually every disease or health effect known to man:

- "BPA Exposure May Cause Infertility" (July 31, 2013)
- "BPA Linked to Obesity in Young Girls" (June 13, 2013)
- "Early BPA Exposure May Damage Tooth Enamel" (June 11, 2013)
- "BPA Exposure Linked to Asthma In Kids" (March 1, 2013)
- "Microbiologist Says BPA Seen Causing Disease Generations Later" (January 28, 2013)
- "High BPA Levels in Kids Linked to Risk for Heart, Kidney Damage" (January 9, 2013).

## Government Agencies Worldwide Support the Safety of BPA Based on a Strong Scientific Foundation

Many government agencies around the world have independently evaluated the science on BPA in recent years. The views of those agencies, which have been regularly updated to include the most recent scientific studies, consistently and strongly support the safety of BPA. Recent examples of government reviews from North America, Europe, and Asia include the following:

- Hong Kong Centre for Food Safety (March 2013)
- Health Canada (September 2012)
- Food Standards Australia New Zealand (April 2012)
- European Food Safety Authority (December 2011)
- Swiss Federal Office of Public Health (December 2011)
- Japanese National Institute of Advanced Industrial Science and Technology (July 2011)
- German Federal Institute for Risk Assessment (May 2011)

But can you really believe the headlines? Is the media telling a complete and accurate story about BPA? If not, what's missing and who can you believe?

### Why is BPA Important?

BPA is used in a wide array of consumer and industrial products that are essential to modern life. The two primary uses for BPA, accounting for about 95 percent of all BPA produced, are to make polycarbonate plastic and epoxy resins. Both are high-performing materials that have been increasingly used for about five decades to make products that you use every day.

Polycarbonate is a highly shatter-resistant, light-weight, and optically clear plastic that also has high heat resistance and excellent electrical resistance. It is that combination of strong attributes that makes polycarbonate unique

among the diverse range of commercially available thermoplastics and, accordingly, so widely used. You'll find it in everything from eyeglass lenses to sports safety equipment, and DVDs to life-saving medical devices. Important for the bottled water industry, polycarbonate is a common material used for home and office delivery's (HOD) 3- and 5-gallon bottles.

Epoxy resins are thermosets (i.e., hard, rigid plastic formed by irreversible curing at point of use) that have a unique combination of toughness, chemical resistance, and strong adhesion. Most epoxy resins are made from BPA, and those resins are commonly used in protective coatings and high-strength/lightweight composites. Common applications for epoxy resins include wind turbine rotor blades, printed circuit boards, automobile primer coatings,

and water-based paints. Epoxy resins are also the most widely used protective coating in food and beverage cans, where the coating plays an important public health role in protecting the safety and integrity of the contents.

### What's All the Excitement About?

For more than 15 years, BPA has fascinated scientists around the world. For much longer than that, it's been known that BPA is a weakly estrogenic compound. That biological property doesn't mean that BPA is harmful, and a large number of other compounds—including naturally occurring components of our daily diet (e.g., soy products)—are also estrogenic. But that property brings BPA to the center of a much broader scientific topic known as endocrine disruption, a term generally used to imply adverse health effects. Because much of what goes on inside our bodies is controlled by various hormones acting within our endocrine system, there is currently intense interest and scientific debate about whether endocrine-active compounds like BPA could interact with our endocrine system in any way—and, if so, whether that could have an effect on health.

As a result of the scientific interest in endocrine disruption, BPA has become one of the best tested of all chemicals, and new studies on BPA are published virtually every day. While most of those studies can only be found in obscure scientific journals, and most are of limited importance, some of them do attract media attention. That's not to say that journalists are scouring scientific journals looking for things to write about. Instead, new studies are regularly brought to the attention of journalists through press releases, most commonly issued by academic institutions and the publishers of journals. Some refer to this phenomenon as "science by press release," but, put more simply, it's a form of self-promotion.

So far in 2013, there have been about 20 press releases touting new BPA studies, mostly from journals or universities, and many of which have attracted media attention. Most of those are in reference to new studies about to be published in the scientific literature where full details of the study can be found. But some are in reference to studies that have not yet been peer-reviewed and published; findings were merely discussed at a conference.

While there may not be anything inherently wrong with publicly promoting new studies, press releases generally do not provide the context necessary to evaluate and understand the significance of a new study. Journalists may assume that a study highlighted in a press release must be important and thus will uncritically write about the study based almost entirely on what is in the press release. But with such a well-studied compound as BPA, what is often missing is the context provided by what is already known about BPA. Some questions that should be asked include the following:

- Is the study consistent with the large weight of scientific evidence already available on BPA?
- Are the test conditions for laboratory animal studies, including the dose levels and how the dose is applied, relevant for humans?
- Do epidemiology study designs allow cause-effect relationships to be established?
- Does the study have critical limitations?

Without such important contextual details, new studies are inevitably reported as scare stories, even if the results are of little or no significance.

### Stories You'll Rarely See in the Media

With the media's one-dimensional focus on scare stories generated by press releases, there are two very important

stories that you'll only rarely, if ever, find in the media. In contrast to the media's approach of reporting on one study at a time, government agencies responsible for evaluating the safety of polycarbonate plastic and epoxy resins apply a quite different approach. That approach, sometimes described as a weight-of-evidence evaluation, involves evaluating and integrating together all relevant studies to reach conclusions that are supported by the best available scientific information.

In the United States, a particularly important example of that approach is provided by the Food and Drug Administration (FDA), which has been evaluating BPA on an ongoing basis for

In further explanation, FDA states that its "current assessment is that BPA is safe at the very low levels that occur in some foods. This assessment is based on review by FDA scientists of hundreds of studies including the latest findings from new studies initiated by the agency."

That conclusion is distinctly different from what might be concluded from recent media stories on BPA, and it well illustrates the importance of basing conclusions on all relevant studies, not just one study at a time. The approach taken by FDA and its conclusion are consistent with the many other regulatory agencies worldwide that have each independently evaluated the safety of BPA. The consensus of these agencies,

## Where Can You Get More Information?

Further information on BPA can be found at [www.FactsAboutBPA.org](http://www.FactsAboutBPA.org) or by contacting the author: [steve\\_hentges@americanchemistry.com](mailto:steve_hentges@americanchemistry.com).

quite a few years. In its most recent update on the safety of BPA from June 2013, FDA's perspective on safety is clearly and concisely summarized in the form of a Q&A that appears on the agency's website (<http://bit.ly/FDAonBPA>):

### *Is BPA safe?*

*Yes. Based on FDA's ongoing safety review of scientific evidence, the available information continues to support the safety of BPA for the currently approved uses in food containers and packaging.*

many of which specifically focused on the safety of BPA in materials that contact food (which are likely to be the most sensitive applications), is that BPA is safe as currently used (see sidebar on page 16). As important as these conclusions might be to consumers—who otherwise may only see media scare stories—these reassuring, and far more important, stories only rarely appear in the media.

In addition to highlighting that its conclusion on the safety of BPA is based on review of hundreds of studies, FDA's recent update also emphasized



something else that has received essentially no media attention: over the last several years, FDA has been conducting, in its own laboratory, a comprehensive research program designed to answer key scientific questions and clarify uncertainties about the safety of BPA. In its most recent update, FDA further stated:

*Because of concerns expressed in the last few years about the safety of BPA, FDA initiated additional studies to help determine whether or not BPA is safe as it is currently used in food packaging and containers. Some of these studies have been completed and others are on-going.*

*The FDA's studies are being conducted by the agency's National Center for Toxicological Research (NCTR). All are conducted under strict quality-assurance guidelines and are designed to produce information that will enhance our evaluation of BPA's safety. The findings of the NCTR studies will be published in peer-reviewed scientific literature and will be reviewed by other experts including toxicologists and other scientists from the academic and private sectors, as well as by other regulatory scientists. The results from these new studies so far support FDA's assessment that the use of BPA in food packaging and containers is safe.*

The research program undertaken by FDA is producing an extraordinarily robust set of scientific data that is virtually unprecedented for any chemical (see sidebar at right). The scientific foundation supporting the safety of BPA is already very strong and will be further strengthened with recently completed research from FDA that will be published soon. Those who have followed the BPA story for many years will be very interested to see if the media takes note of FDA's important research.

## FDA Research Provides Strong Support for the Safety of BPA

Starting in 2009, scientists at FDA's National Center for Toxicological Research have been executing a remarkable series of studies to answer key scientific questions and resolve uncertainties about the safety of BPA. To date, that program has resulted in 13 peer-reviewed scientific publications with more to come. Taken together, the findings from those studies provide strong support for the safety of BPA.

Most of the studies published so far focus on how BPA is processed in the body, which provides important information on the potential for BPA to cause toxicity. In general, these studies confirm that BPA is efficiently metabolized and quickly eliminated from the body at all ages, which helps support the conclusion that BPA is unlikely to cause health effects at any age. Important findings from these studies include the following:

- A series of studies on monkeys and rats confirm that BPA is efficiently metabolized not only in adults but also in pregnant animals, neonates, and the fetus.
- The amount of BPA that could reach the fetus is extremely low due to the efficient metabolism of BPA by the mother, which protects the fetus from exposure.
- A study in mice confirms that BPA does not accumulate in adipose tissue (fat) and does not persist in the body.
- Because of physiological differences noted between rodents and monkeys, health effect studies in rodents are likely to over-predict the potential for health effects in primates, including humans. This is very important because most health effect studies are conducted in rodents.

In the near future, FDA will publish the results of a subchronic toxicity study, which is one of the most comprehensive studies ever conducted on BPA. The study found no evidence that BPA causes health effects at any dose even remotely close to human exposure levels.

**Steve Hentges** leads the Polycarbonate/BPA Global Group, which consists of the leading global manufacturers of BPA and polycarbonate plastic. This group of the American Chemistry Council sponsors health and environmental research and supports a wide range of communications and advocacy activities. Hentges holds a PhD in organic chemistry from Stanford University and a BS in chemistry from the University of Minnesota. In his current position, he has been deeply involved with the science on BPA for more than 13 years.