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HOUSEHOLD PLASTICS CONTAIN A CHEMICAL THAT CAN HARM BABIES. IT'S BEEN BANNED IN CHILDREN'S PRODUCTS OVERSEAS, BUT OUR AUTHORITIES SAY IT'S SAFE.

WHAT IF THEY'VE GOT IT WRONG?

By Amanda Watt

you're soaking in it

Toxic chemicals are everywhere – in soaps, baby bottles, even canned foods. Some overseas regulators are alarmed. Why not ours?

Story **Amanda Watt**

Narelle Chenery has given up accosting strangers in the supermarket when she sees them pick up chemical-laden cleaners and lotions, but her relatives aren't immune. The Gold Coast-based organic cosmetics pioneer recently dropped in at her cousin's house to visit his new baby daughter, and came out of the guest bathroom clutching the store-bought liquid soap dispenser.

"I sat down with him and just went through it ingredient by ingredient, pointing out all the potential dangers in what he thought was a 'green' product," she recalls. "He was really pissed off because he felt he'd been duped." Chenery has a degree in applied science but her extensive knowledge of chemicals and what she calls the "greenwashing" techniques used by product marketers is the result of 16 years of research. Consumers, she says, are "blissfully ignorant or dangerously ignorant, unless they are one of the very few highly educated people questioning the conventional wisdom of everyday chemicals".

"I used to harass people in the cleaning aisles when they'd pick up an 'organic essence' product," she adds. "[I'd] say, 'Can I tell you a little bit about that?' – but eventually I came to realise not everyone is ready to hear about it."

Until recently, I wasn't either. Like you, I was confident the products I bought from the supermarket were harmless to my health. I trusted that scientists somewhere were monitoring the safety of the cocktail of chemicals that form part of modern life. I was certainly unconcerned about the makeup of the containers, cans and bottles on my shelves. I assumed regulators erred on the side of caution and banned any substance with question marks over its safety. I was wrong.

I email Chenery photos of the ingredient lists on the back of three products in my bathroom: a salon-bought hairspray, a brand-name facial moisturiser with sunscreen, and a handwash I plucked from the supermarket shelf specifically for its eco credentials. "Oh god, you'll be horrified," Chenery warns as she rattles off the ingredients and their links to endocrine disruption, reproductive toxicity and, possibly, cancer. "It's ludicrous," she tells me, "that a handwash claiming to be [natural] can contain ingredients that are known to be contaminated with carcinogens, preservatives that are based on toxic formaldehyde and ingredients that create nitrosamines, which are also known carcinogens." Then there are synthetic fragrances, found in everything from handwash to shampoo to floor cleaners. They are a "chronically underrated toxin", Chenery says, with "more in common with diesel fumes than the beautiful flowers and plants we like to associate them with. They contain up to 4000 ingredients, many of which are suspected or proven carcinogens known to trigger asthma attacks. Our houses are chemical time bombs."

Chenery stopped buying grocery items in plastic packaging years ago because of concerns the potential toxins inside – Bisphenol A (BPA) and phthalates – might leach into the food. Those toxins, she tells *Qweekend*, can have a "cascade effect on the hormonal system, creating all sorts of problems for kids and adults down the track". And she hasn't even gotten around to warning me about the BPA that could be sitting in the canned food in my pantry.

LIKE IT OR NOT, YOU'RE SOAKING IN IT. WHEN you brush your teeth you may well be ingesting triclosan, the same toxin that could be in that antibacterial hand sanitiser you've been using several times a day. The air freshener in your bathroom, your favourite shampoo and your designer perfume all contain synthetic fragrances, the same ones that are in your "fresh"-smelling bin liners and baby wipes. And that plastic container of leftovers you're about to zap in the microwave? If it doesn't contain phthalates (the toxic plasticisers found in shower curtains, wrappers and some toys), chances are it contains BPA, an organic compound that's a known "endocrine disruptor", has been linked to developmental and reproductive problems and has a nasty habit of leaching into food at high temperatures. It's emerged that you mightn't even need to heat food to expose yourself to BPA: consumer advocates Choice last week released the results of a test of 38 canned foods from Australian supermarket shelves. It found 29 contained the toxin – perhaps not surprising, given it's used in the lining of cans to prevent corrosion.

Nobody denies that in most cases, these chemicals are present in our lives in small doses. But put them all together, in repeated daily exposure over a lifetime, and what effect is it ▶

having on our health? Right now, scientists can only speculate. Because while individual chemicals are tested for their possible adverse effects, no-one is testing the combination. There are no routine tests in Australia for chemicals persisting in our bodies, but as it's been proven that most Americans have some sort of chemical residue in their bloodstream, it's extremely likely most of us do, too. And while it's accepted that children are at greater risk from exposure to chemicals, toxicity tends to be assessed on the basis of acute exposure to adults, not subtle effects on children.

Look at how an individual chemical is assessed by Australia's regulators, and the news doesn't get much better. BPA has been declared safe for use in baby bottles and cups in Australia despite the fact Denmark, France, Canada and several American states are sufficiently concerned by the emerging science around its ability to leach into liquids and potentially cause harm at low levels that they've banned its use in baby bottles. The US Food and Drug Administration (FDA), which previously shared Australia's position that it is safe, now has "some concern about the potential effects of BPA on the brain, behaviour and prostate gland in foetuses, infants and young children".

In late June, a voluntary recall of baby bottles containing BPA was agreed to by a handful of major Australian retailers in a bid to appease worried consumers, but Food Standards Australia New Zealand (FSANZ) is adamant the products do not pose a health risk. That assessment is partly based on a recent study by the Australian Competition and Consumer Commission – one of several taxpayer-funded regulators sharing responsibility for the issue – that tested five polycarbonate baby bottles containing BPA and detected no trace of the chemical in water or baby formula inside. As a result it declared "infant exposure to BPA from feeding bottles and sip cups supplied in Australia is not of concern". More on the criticisms of that study later.

"Can you understand," I ask Marcus Bezzi, the enforcement and compliance chief at the ACCC, "how a lay person would be confused when other countries have either banned products containing BPA or withdrawn them … yet this ACCC report says they're safe?"

"Well, I can understand why there might be some confusion out there," Bezzi replies, "but as a regulator we've got to operate on the basis of the evidence we have before us."

I ask if the chemical alternatives used in the "BPA-free" bottles now appearing on chemists' and department store shelves are known to be any safer. "If anyone suggests there is a problem," he says, "we can certainly take some action in getting to the bottom of whether they've got a point, but in the meantime we don't really see it as our role to alarm people."

But people are alarmed, and they're people who should know. Respiratory paediatrician Professor Peter Sly, deputy director of the Queensland Children's Medical Research Institute, is concerned about the potential dangers to children and foetuses from household products. It's wrong to think "you can buy something in the supermarket and because it doesn't have nasty warning signs on it then it must be safe", Sly tells *Qweekend*. The science linking in-utero chemical exposure with cancer, changes in brain development and endocrine disruption is increasing, but most of the work is on animals and "it's not really easy to completely be certain how bad some of these things are".

Canadian biologist Rick Smith and science consultant Bruce Lourie, authors of the recent book *Slow Death By Rubber Duck*, gave a graphic example of the risks when they used their own bodies as laboratories and deliberately exposed themselves to a soup of chemicals via a combination of everyday products. The levels of BPA in Smith's blood increased 7.5 times after heating and eating canned foods out of a microwavable, polycarbonate plastic container during their two-day experiment, while phthalate levels increased as much as 22 times after using a mix of common personal care products. The triclosan in Smith's urine jumped from 2.47 nanograms per millilitre to 7180 ng/ml after he used eight products (including toothpaste, shave gel, deodorant and shower soap) for two days. On ABC radio earlier this year, Lourie was blunt. "We are starting to see now in industrialised countries epidemics that are unexplainable but are now being linked to the pervasive use of chemicals – things like autism, ADHD, obesity, asthma. One of the challenges we have with these chemicals is that they can occur in very small amounts and it takes many, many years for an effect to be seen."

Take the emerging science suggesting a link between chemicals and ill health and factor in the large grey areas in our testing and monitoring processes, and there's a strong argument for caution as the only reasonable approach. But as it stands, Sly says, chemicals are assessed on the basis of acute or high levels of exposure, and "almost never" tested for subtle, low-dose effects. Almost all toxicology is done on individual chemicals, yet "very rarely is an individual exposed to just one chemical".

There is weight behind the calls for a precautionary approach. The US President's Cancer Panel 2008-9 found in its annual report, released in April, that the "true burden of environmentally induced cancer has been grossly underestimated". It concluded that "with nearly 80,000 chemicals on the market in the US … exposure to potential environmental carcinogens is widespread". While there may not be irrefutable proof of harm, "in a great many instances we know enough to act". As Lourie says, "This whole notion that we need a smoking gun, we need evidence [or] dead bodies – that is just not going to happen with these chemicals. We have to get away from some of the older notions we have of 'show us the evidence' and make precautionary decisions."

It may not be difficult to sell that concept to consumers. During Lourie and Smith's Australian tour, sales of their book spiked by about 600 per cent. Chenery's ONEGroup empire, which began in 1998 as a small mail-order outfit with products concocted in her kitchen, now ships its certified organic label to 40,000 customers in Australia and another 40,000 internationally. "There is an awakening," Chenery says. "Ten years ago I felt I was hitting my head against a brick wall but in the past couple of years there has definitely been growing interest." Individuals, she says, must take personal responsibility for their health. "Consumers can't be expecting corporations to be looking after their best interests because they have vested interests in the products they are manufacturing and selling."

> **Consumers can't expect corporations to be looking after their best interests.**

Fighting back … Organic cosmetics pioneer Narelle Chenery at her Gold Coast factory.

IT'S BEEN TEN YEARS SINCE BPA WAS "OUTED" as a potential problem. So what have Australian authorities been doing about it? FSANZ's spokeswoman, Lydia Buchtmann, says the body regularly "reviews" international research and other regulators' moves on the chemical and "works on the latest available science". She cites two recent studies as supporting her organisation's position that baby bottles containing BPA are safe: European research completed 18 months ago that concluded "it wasn't a safety risk" and the recent analysis done by the ACCC.

The ACCC study, not made public but released to *Qweekend*, examined ten new baby bottles and sip cups (those containing BPA as well as BPA-free and glass) on the Australian market and roadtested them three ways each "under realistic conditions of use", using both formula and tap water. Bottles were cleaned once and placed in boiling water to sterilise them. Those filled with formula were placed in water heated to 35-40°C. Those filled with tap water were not heated. Laboratory testing of all 30 samples found no evidence BPA had leached into the formula or water. At first it appeared to be a reassuring result. But the study analysed only five bottles containing BPA and tested them three times each. (The ACCC's product safety manager, Ruth Mackay, says it was a "small and manageable sample we could do in a reasonable timeframe".) And the detection level for BPA in the liquids was set at ten parts per billion – at which Dr Mariann Lloyd-Smith, a senior adviser to Australian environmental health lobby group National Toxics Network, is aghast. "When detection levels are so high you set out to find nothing," she says. "When we talk of endocrine disruption we are talking about nanograms, or parts per trillion." Lloyd-Smith says both studies cited by FSANZ are flawed because the emerging science regarding the potential for harm from low doses hasn't been taken into account.

A Korean study of baby bottles published in March is more revealing. The Koreans tested bottles and their level of leaching after up to 100 uses and after being heated in water between 40 and 100°C. In brand-new bottles, BPA was found to migrate at very low levels (0.03 and 0.13 parts per billion at 40°C and 95°C respectively) but levels in a six-month-old bottle jumped to 0.18 and 18.47 ppb at the same temperatures. Migration also "rapidly increased" when water temperature exceeded 80°C.

Lloyd-Smith's criticisms don't end with the ACCC report. I ask her about the FSANZ website's sheet on BPA, which includes the statement that "Bisphenol A does not cause cancer". "It infuriates me at its ignorance and angers me with its unsurpassed arrogance," she says. "FSANZ would know BPA has never been fully evaluated for carcinogenicity, yet many studies have shown a link between various cancers and BPA." The US President's Cancer Panel says "over the past decade more than 130 studies have linked BPA to breast cancer, obesity and other disorders", and points to the risk of exposure in utero via placental transfer and breast milk: "Tests of umbilical cord blood found traces of nearly 300 pollutants in newborns' bodies, such as chemicals used in fast-food packaging, flame retardants present in household dust, and pesticides."

> It's not easy to be certain how bad these things are.

Warning signs … Paediatrician Peter Sly is concerned about the effects of household products on children.

Richard Denniss, executive director of think tank the Australia Institute, has concerns about a "culture of complacency" in the national food safety regulator. After the US FDA announced in January that it would rethink its stance on BPA on the basis of "recent studies using novel approaches to test for subtle effects", the Australia Institute lodged a Freedom of Information search for internal documents showing the basis for Australia's no-change decision. "To be honest, I didn't think we'd find as much as we did," Denniss tells *Qweekend*.

A draft report prepared by FSANZ for parliamentary secretary for health Mark Butler included notations suggesting the agency wanted to cover up international concerns. "May be too sensitive to tell the Minister?" is one comment beside a reference to Canada limiting the amount of BPA released into the environment. A note on the section on negotiations with industry to phase out products says: "Would delete this – we do not want to be seen to be encouraging withdrawal of something we deem to be safe." An internal email confirms FSANZ had been "quoting FDA as saying no health risk and now they have changed this, which makes us all look a little vulnerable". FSANZ spokeswoman Buchtmann concedes the language was "regrettable" and says staff involved have since been counselled.

Not good enough, says Denniss. After reading the emails, he says he "doesn't have as much faith in our system" as he'd like to. "We don't know what's safe and what's not, but it's obvious that neither do they." He wants the precautionary principle applied, especially when it comes to chemicals in plastics. "The benefits of their inclusion is trivially small and the potential harm is very significant. If there is uncertainty, why wouldn't we be cautious? Why wouldn't we tread carefully? We have glass bottles, we have stainless-steel containers. It's not as if we are talking about potential side-effects from life-saving drugs – we are talking here about potential side-effects from everyday products for which there is a wide range of safer alternatives."

Gold Coast grandmother Nadia Duensing, 59, isn't shocked by the revelations. Her frustrations with Australia's regulators date back to 2008, when she learned of Canada's proposed BPA baby bottle ban. Having enjoyed success importing bio-identical hormones for a range of conditions, she set about researching the safest BPA-free options in baby bottles. She found them in Taiwan: honey-coloured polyethersulfone (PES) bottles that were resistant to temperatures of up to 204°C and therefore considered immune to the leaching that occurs when plastic is heated. Her business Smart Baby (since changed hands) sold thousands within its first year. Duensing's two sons were grown up when she began her crusade. What was her motivation? "Australian children," she says. She places her hand against her chest. "My heart just bled, you know? A lot of mothers are working and busy and don't get to watch TV or read the newspapers."

She fired off letters to authorities, questioning their analysis of BPA and campaigning for a ban, but got the same response each time: the levels of exposure in baby bottles were very low and did not pose a significant risk to public health. But Duensing considers the case against BPA overwhelming. She taps the pile of media reports and research papers she's gathered on the subject over the past three years. "If the Health Minister of Canada can get his office to check out all the studies that are out there and have the guts to make a decision to err on the side of caution, why can't we? The whole thing leaves me perplexed." ▶

IT'S CLEAR THAT OUR REGULATORS CONSIDER the concerns over BPA largely unjustified and their checks and measures adequate. Dr John Whitehall, the former director of Townsville Hospital's neonatal intensive care ward and now professor of paediatrics at the University of Western Sydney, is another who's not moved by the hype. While not professing to be an expert on the chemical, he tells me he's "cynical" about its effect in baby bottles, pointing out that it pales in comparison to the "three great satans" for children's health: exposure to alcohol, tobacco and marijuana.

Sly agrees – to a point. "Things have to be put into a degree of perspective. None of these [issues of chemical exposure] are as big a threat to the health of children as smoking." But, he says, the jury is still out on chemicals. Who knows what science will be saying 15, 20, 30 years down the track?

In the meantime, says Denniss, Australians would be "quite surprised how little actual research our regulators are undertaking". The ACCC confirmed its February testing of BPA migration from baby bottles was the first it had undertaken. FSANZ conducts a "total diet study" every five years to assess contamination by substances such as agricultural chemicals. It was dropped back from two-yearly cycles because, says Buchtmann, they "found no problem". That verdict did not factor in BPA. In May, the regulator began a study to determine levels of BPA potentially leaching into processed and packaged foods such as canned tuna, soft drink and frozen meals. The results are expected next month.

But Choice is a step ahead. Its own analysis of canned foods showed 29 of the 38 it tested contained "BPA at levels some experts believe could be harmful". Those with the highest levels (more than 200ppb) included Edgell corn kernels, John West Tuna Olive Oil Blend and three samples of Heinz baby or children's food. As a result Heinz announced it would introduce BPA-free packaging for its baby food range. Choice spokesman Christopher Zinn called on the government to "phase out BPA packaging for all baby foods and foods designed for toddlers and young children". "Opinion may be divided on the potential health hazards of BPA," Zinn said, "but why take unnecessary risks, especially with young children?"

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FSANZ says none of the BPA found in the survey comes close to breaching internationally accepted safety limits. "By our calculations," says Buchtmann, "for one of the baby custards tested, a nine-month-old baby would have to eat more than 1kg every day to breach that safety limit of 50 micrograms of BPA per kilogram of body weight per day."

Professor Matti Lang, director of the Brisbane-based National Research Centre for Environmental Toxicology, or Entox, says the human body has a complex defence system but warns that shouldn't encourage people to be relaxed about the chemical burden in their environment. "I would personally apply the principle of cautiousness," he says. "My guess is that we are underestimating the total chemical burden. We are drowning in chemicals. That I find a real concern."

Entox is seeking answers. One proposed long-term project would involve collecting Queenslanders' used pathology samples to assess the presence of chemicals in blood. Separate projects analysing BPA and measuring chemical exposure in infants and children are mooted in a collaboration between Entox and Sly, while Entox is also concerned with developing better tests to assess chemicals' biological effects.

Until some of these questions are resolved, says Lang, limiting exposure is the "only reasonable way to act". He suggests people forego processed food for fresh, simple ingredients and cut down on detergents and chemicals. Top of Lourie and Smith's list is the warning not to microwave food in plastic to prevent leaching; they also advise eating organic food as much as possible and avoiding antibacterial or highly fragranced personal care products. The US Cancer Panel agrees individuals have a role to play. "Parents and childcare providers should choose foods, house and garden products, play spaces, toys, medicines and medical tests that will minimise children's exposure to toxics," its report says. "Ideally both mothers and fathers should avoid exposure to endocrine-disrupting chemicals and known or suspected carcinogens prior to a child's conception and throughout pregnancy and early life when risk of damage is greatest."

Sly gives a practical example. "The very first thing expectant parents tend to do is renovate and paint the baby's room, buy new furniture which is all generally full of chipboard and formaldehyde and volatile organics, and then they bring their baby home and put it in this little hotbed of environmental toxicants. So a very simple thing is, don't do that."

So what of those BPA-free containers now on store shelves? What's in *them*? FSANZ's Buchtmann pauses at this point in our interview. "That's a good point," she says. The ACCC's Ruth Mackay doesn't have a direct answer either. "There are many, many chemicals in the production of consumer products [and] they change quite frequently," she tells *Qweekend*, "so I think it's not clear without knowing exactly what chemicals are in which products what risks there might be associated with them."

I ask Sly for his take on the chemical alternative to BPA. "We don't even know what it is!" he responds. So how do we know if it is any safer than BPA? "You've got it. We don't. That is the whole point of what I'm saying."

It could be worse than BPA? "I'm not saying it is," he stresses. "I have absolutely no idea, but we don't know what it is and no-one is required to tell us." Sly leans back in his chair. "There's no easy fix in any of this," he says. "But there never will be if people don't start thinking about it." ■

PHOTOGRAPHY: DAVID KELLY

toxic stock
Chemical nasties in the home

Bisphenol A (BPA)
Found in polycarbonate containers, baby bottles, reusable water bottles and metal-based food and beverage cans. Known "endocrine disruptor" linked to reproductive problems.

Triclosan
Anti-bacterial agent used in soaps, mouthwashes, detergents, toothpastes, deodorants and hand sanitisers. Linked to a weakening of the immune system.

Phthalates
Chemical used to make plastics soft and pliable. Found in toys, PVC piping, shower curtains and inflatable products. Concerns about risk to foetuses and young children.

Brominated flame retardants
Used to reduce flammability of clothing (such as children's pyjamas), furnishings and electronics. Concerns about impact on human health.

Perfluorooctanoic acid (PFOA)
Used in making some non-stick cookware (including Teflon) and stain-resistant footwear and clothing. Concerns about potential human harm.