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The toxic chemical New York's dry cleaners can't quit

Perchloroethylene, used throughout the dry cleaning industry under the name perc, has been a concern for decades, leading to concerns about poisoned workers and environmental health risks

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Meurice Garment Care, owned by Wayne Edelman, has a perc machine but now uses it sparingly

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Martha Montalván arrived from Ecuador in 2002 at age 19 and worked 12 hours every day except Sunday at a dry cleaner on East 109th Street, where she was paid \$300 a week in cash. That came out to \$4.16 per hour, well below the minimum wage, but as an undocumented immigrant who couldn't speak English, she didn't have better options.

After three years of washing, folding and packaging shirts, she began experiencing dizzy spells and headaches. The skin on her face turned red and hot, and the washing machines' nonstop rumbling damaged her hearing. She worked a fourth year at the shop, then quit when she got pregnant. "It was just four years of my life," Montalván said in Spanish. "But it had a very strong impact."

The most visible signs are the hearing aids the 33-year-old wears. Worse is the internal damage that medical experts said is consistent with years of exposure to the hazardous solvent that most New York City dry cleaners use to wash clothes, a pollutant that regulators have been trying to phase out for nearly 20 years. Montalván's liver is damaged and she can no longer eat foods seasoned with salt, pepper or anything spicy. Her doctor ordered her to avoid any work that involves handling chemicals, which means hair-salon or office-cleaning jobs are off-limits. She now works at a restaurant.

"I fell into it," said Montalván of her dry-cleaning job. "There's nothing I can do about that now." She added that her 9-year-old daughter is healthy.

There are 10,000 people who work in the approximately 3,500 dry cleaners where New Yorkers get their suits and dresses laundered. [Workers in one of every five](#) of these shops are exposed daily to a chemical that the U.S. Environmental Protection Agency deems a "likely carcinogen" that can harm the liver, kidneys and blood, and the immune, reproductive and central nervous systems. California banned the solvent in 2007. Jack Nicholson turned into the Joker when he fell into a vat of the stuff in the first *Batman* movie. That chemical is called

perchloroethylene, or perc. For the majority of the 1,200 dry cleaners in the city that do their work on-premises, it is the go-to ingredient for getting stains out. But for dry-cleaner workers and New Yorkers living nearby, airborne perc is a hidden hazard that remains well above acceptable levels—despite efforts by New York to rein it in after the EPA in 1993 started regulating how dry cleaners use the chemical.

Triple acceptable levels

A 2013 study in the journal *Environmental Research* showed average perc readings of 106 micrograms per cubic meter in low-income New York households near dry cleaners, more than triple the limit of 30 micrograms per cubic meter recommended by the New York state Department of Health. Children are especially vulnerable to perc because they inhale more air relative to their size than adults, and ingest it from their mothers when nursing.

Perc isn't just a problem for poor people who live near or work in dry cleaners. Some 2.3 million New Yorkers live within 650 feet of the city's approximately 400 perc dry cleaners located in apartment buildings, according to a 2009 study. The same report found that residents of neighborhoods with a lot of these shops have 15% higher rates of kidney cancer, though further research is needed to definitively establish a link. Upper-floor apartments and neighboring buildings can have high perc readings because the vapor travels through elevator shafts and air vents.

Most people are aware of perc only when they smell the sweet chemical scent at a dry cleaner or in someone's closet. Wearing dry-cleaned clothes is not considered hazardous because the chemical's presence is typically low. The risk comes from inhaling a steady dose over time. Many people have no idea if they're exposed because the human nose can't detect perc until concentrations reach 6,000 micrograms per cubic meter—200 times the recommended maximum.

"It's very insidious," said Judith Schreiber, former chief scientist at the New York state attorney general's Environmental Protection Bureau and one of the nation's leading investigators on the health effects of perc. "People just don't realize they are being exposed to perc because they don't smell anything."

Nora Nealis, executive director of the National Cleaners Association, said perc is not a threat to most New Yorkers. She said health standards are based on worst-case assumptions that seldom play out, such as residents living near dry cleaners for multiple decades and never leaving their apartments. "A dry cleaner is a safe neighbor," Nealis said.

Mori Mickelson and her husband began smelling perc from the dry cleaner directly below their Upper West Side apartment shortly after they moved in 21 years ago. They complained, and a year later the city sealed the shop's perc machine, forcing it to ship clothes to an industrial laundry. But the shop continued to spot-clean with perc and to press clothes still damp with the solvent. When a small amount of perc remaining in the sealed machine spilled out, Mickelson nearly passed out while nursing her infant son. They were taken by ambulance to a hospital, where doctors found her lungs had been burned by perc. Still, the dry cleaner stayed open until last year. The odor has finally faded away, but Mickelson worries about long-term health effects from the lengthy exposure.

"You just figure that if there are these dangerous chemicals polluting your apartment, that you just complain and the city will fix things," she said. "It's an apartment, not some industrial factory, right? But it didn't work that way."

2020 deadline

Dry cleaners are required to post a sign saying they use perc, but landlords' obligations to tell tenants if there's an issue are less clear. State Health Department guidelines say "reasonable and practical actions should be taken" when perc exceeds typical indoor levels of under 10 micrograms per cubic meter, and the state "recommends

taking immediate action” when levels exceed 300 micrograms per cubic meter. But these are not requirements. The city does not regularly monitor dry-cleaning emissions, and since the start of 2011, according to documents obtained by *Crain’s* under the Freedom of Information Law, city health inspectors have received about 250 complaints for dry cleaners, laundromats and residential laundry rooms, underscoring how much perc must be in the air before people can smell it.

“We are concerned about the health of people who may have been exposed to perc and will continue to respond to residents concerned about possible exposure to elevated levels of perc,” said a spokesman for the city Health Department. The city’s Department of Environmental Protection inspects dry cleaners every three years, a spokesman there said, adding that shop employees are supposed to examine vents daily to ensure perc isn’t escaping.



Buck Ennis

Edelman once cleaned Princess Diana's clothes, and acknowledges that despite the risks, perc is the best solvent for cleaning

Federal environmental authorities concluded a decade ago that perc dry cleaners in apartment buildings pose an unacceptable health risk and must vacate nationwide by 2020. Even with the deadline looming, hundreds of dry cleaners in the city continue to use perc. “Nothing is better,” said Wayne Edelman, owner of Meurice Garment Care, which cleaned Princess Diana’s clothes. “There are alternatives and we use a lot of them, but perc, used correctly, is tried-and-true.”

Perc’s persistence also says a lot about the sorry state of many of the dry cleaners that are a fixture of the New York streetscape. Rising rents, higher labor and utility costs, and flat or falling revenues are slowly leading to the closure of these shops, many of them single storefronts that generate as little as \$200,000 in annual revenue. The response to fading fortunes is to [pay workers as little as they can](#) and put off spending tens of thousands of dollars on non-perc machines and the sprinkler systems required by the fire code when machines are replaced, an additional cost of as much as \$100,000.

“Cleaners want to make the change, but many can’t afford it,” said Nealis.

Said Kam Saifi, chief executive of Next Cleaners, a chain of about 20 dry cleaners that doesn’t use perc: “This is an industry caught in a negative spiral.”

Pressed for profits

Dry cleaning dates back to the mid-19th century, when it was discovered that camphene, a fuel for oil lamps, was great at removing greasy stains from fabric. Because such fuels are explosive, fire codes confined commercial dry cleaners to the edges of towns. Perc, developed in the 1930s, was a leap forward because it was nonflammable. After World War II, dry cleaners began popping up in residential neighborhoods across the country. There are now 40,000 nationwide, and nearly one in 10 are in New York City.

In the 1970s, the first generation of owners started selling out to Korean immigrants who arrived in large numbers after Congress in 1965 abolished country-specific immigration quotas. Dry cleaning required minimal knowledge of English, and the shops were traditionally closed on Sundays. That made them attractive to Koreans, many of whom are practicing Christians. Though newer immigrant groups like Chinese and Latinos are now making inroads, the dry-cleaning industry in New York remains more than 60%-owned by Korean-Americans, said Pyong Gap Min, a sociologist at Queens College and director of the Research Center for the Korean Community.

Daniel Lee's dry-cleaning business on East 23rd Street still does most of its work on-premises. (The majority of his competitors are "drop shops" that ship clothes to an industrial laundry.) Every day, 150 customers come through his doors, dropping off 350 items for dry cleaning. Each pays an average bill of around \$30. If buttons or seams are loose, someone from his staff of 13 will sew them tight. Temperatures are constantly monitored so clothes aren't pressed too hot, a common error that makes suits shiny.



Buck Ennis

Judith Schreiber, former chief scientist at the New York state attorney general's Environmental Protection Bureau, spearheaded a report that found that residents of neighborhoods with a lot of perc shops have 15% higher rates of kidney cancer

\$150,000, an investment that, Lee said in late March, he was delaying making in the hope that the EPA's 2020 deadline would be pushed back. It happens that the industry has a lengthy track record of stalling regulations that would limit perc use.

"The thing about perc is people really don't care," Lee said over breakfast. "They want the job done right and don't care much about how it's done."

A 40-year saga

Regulators began scrutinizing perc in the 1970s, when they started examining how dry cleaners and industrial users contaminated groundwater and soil by dumping buckets of used solvent down drains. Many of these polluted areas are now federal Superfund sites. Looking at perc vapor, regulators found that even the most conscientious dry cleaners struggled to contain leaks from machines that by their nature shake and rattle. As a rule of thumb, roughly 10% of the perc in a dry-cleaning machine finds its way into nearby apartments each year, and researchers concluded that airborne perc posed a much greater public health threat in urban areas than groundwater perc because people breathe air more often than they drink water.

The EPA started to regulate how dry cleaners handle perc in 1993, three years after Congress revised the Clean Air Act and the agency beat back a lawsuit from cleaners, Shell Oil and Dow Chemical. Dow was a major perc manufacturer until last December, when it sold most of its chlorine business for \$5 billion.

Even with the steady stream of business, Lee said, profit margins have dropped to 10% from their historical high of 33%. Rent is \$16,000 a month and utilities run about another \$6,000. His labor costs will increase by more than 50% over the next three years as the minimum wage rises to \$15 an hour, from \$9. What's more, there's a Chinese-run laundry around the corner that charges half as much and is open Sundays because its owners are Buddhist.

To hold the line on costs, Lee parks his 2003 Toyota Corolla on the street every morning—he can usually find a spot because his day starts at 5 a.m.—and drops off orders on his way home at night. His delivery area is everywhere in Manhattan south of 125th Street. "Everyone is fighting for everything," he said.

Most dry cleaners feel the same way. Over the past 10 years, the industry's revenues nationwide have sunk by 13%, or \$1.4 billion, according to research firm IBIS, which predicts another 6% decline through 2020. The culprit: People are buying fewer clothes that require dry cleaning, and in New York, competition is so stiff that owners struggle to increase prices fast enough to offset rising costs.

The last thing Lee wants to hear is how he needs to spend a lot of money to buy new machines that don't use perc. His perc machines are 20 years old, typically an age at which they leak lots of vapor. He minimizes exposure by keeping the machines quarantined behind a glass wall, which needed repair on a recent visit. Replacing both dry-cleaning machines would cost

Quote

“This is an industry caught in a negative spiral”

After protracted negotiations between public health officials and mom-and-pop owners worried about being forced out of business, New York state unveiled new rules for perc dry cleaners in 1997. Old machines had to be replaced with models that wash and dry clothes, eliminating the need for workers to haul vats of perc-saturated apparel between machines, and fans had to be installed inside perc machines to capture vapor so workers wouldn't inhale a plume when they opened the doors. Dry cleaners were given until 2005 to comply with the rules, in part because there weren't enough new machines available for everyone who needed them.

The same year New York unveiled perc regulations, a janitor named James Doherty was assigned to work at a Harlem building that once housed an industrial dry cleaner and—briefly—a public school. After less than a year on the job, his urine turned bright red with blood and he checked into a hospital, where he spent 20 days: His kidneys had failed. In 2000, Doherty and his wife, Rosemary, sued the building owner for exposing him to perc and sought \$2 million. The landlord countered that James' problems were caused by pre-existing conditions. “There were causality issues,” recalled the Dohertys' attorney, Alexander Sansone. The Dohertys eventually settled for \$150,000; though, after fees, they took home just \$50,000. James, now 74, spends three-and-a-half hours a day, three days a week, on a dialysis machine. “It's not the greatest life,” said Rosemary Doherty, “but what can you do?”

The Dohertys' case helps illustrate why people seldom sue dry cleaners or landlords for the damage caused by perc. Because the chemical is so pervasive and linked to many different maladies, showing cause-and-effect is harder than it is for exposure to asbestos, which is strongly linked to mesothelioma.

As the years went by, regulators continued tightening the screws on perc, but slowly and haltingly. In 2006, the EPA gave perc dry cleaners 14 years to get out of apartment buildings. A year later, California banned the solvent—effective in 2023. In 2008, New Jersey considered banning perc starting in 2021, but dry cleaners protested and the state backed down. “Perc can be contained. The risk can be managed,” Nealis of the National Cleaners Association told trade publication *American Drycleaner* at the time. “There is no reason to phase it out, and we're going to push back. We're not going to let them take it away from us—not without a fight.”

Safe alternatives

Instead, New Jersey began offering dry cleaners financial incentives to replace perc machines. About \$6 million in grants have been handed out and 262 machines removed. New York had such a program but it lapsed around 2000, when the money ran out, said Nealis, adding that if the state or city revived it, the line of dry cleaners seeking help “would stretch all the way to Washington.”

Some local cleaners are biting the bullet and buying new machines. A few weeks after his interview with *Crain's*, Lee decided to buy non-perc machines and is awaiting approval from the apartment building that houses his shop to install them. The new machines might eventually help bring new business, but for now they mainly represent a hefty cost.

That's why the cleaners making the move to cleaner tech, like Next Cleaners' Saifi, are the ones with money. Before launching the chain, the 55-year-old native of Iran was a venture-capital and operations executive at Morgan Stanley. He then led a Manhattan-based software company that was acquired early last decade for more than \$400 million. Next Cleaners has about 20 drop shops around the city that funnel clothes to a plant in Kearny, NJ. The Radio City Rockettes send their laundry to Next Cleaners, and Saifi is busy persuading dry cleaners and corporate clients to route orders to his plant, which currently washes 40,000 shirts a week and has capacity for 300,000. He hopes Next Cleaners will consolidate the industry by becoming the standard for customers looking for a more environmentally friendly cleaner. “We want to give dry cleaners technical and marketing help so they can retool and retrain,” he said. “The industry is archaic and stuck.”



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A few weeks after speaking with Crain's, Daniel Lee decided to buy non-perc machines and is awaiting approval from the building

Next Cleaners, like many shops that position themselves as “eco-friendly,” uses a solvent called Green Earth, which is essentially microscopic sand particles. Green Earth is certainly better than perc, but the Natural Resources Defense Council has described it as “not really green” because California officials have said its active ingredient, decamethylcyclotetrasiloxane, or D5, has been linked to uterine cancer in rats. Earlier this year, European Union authorities moved to restrict its use in personal-care products like shampoos and shower gels. Green Earth’s manufacturer says on its website that its product poses no risk to human health. “D5 is one of the most extensively studied materials in consumer applications,” the company said.



Buck Ennis

Before launching Next Cleaners, which uses alternative solvent Green Earth, Kam Saifi was a venture-capital and operations executive at Morgan Stanley

Other perc alternatives have their own issues. A common substitute called hydrocarbon, branded as EcoSolv or DF-2000, is a petroleum-based product manufactured by Chevron and Exxon. A greener alternative made from liquefied carbon dioxide is too expensive for most dry cleaners. Both Green Earth and liquefied carbon dioxide

require a lot of heat and pressure, making them unappealing options for many dry cleaners in apartment buildings.

In 2010, the New York City Council held a hearing on how to regulate dry cleaners who marketed themselves as “organic” but nothing came of it because of disagreements over what the term meant. In the context of food, “organic” refers to something raised without pesticides, but in the chemistry world, “organic” means anything made from carbon.

According to Peter Sinsheimer, executive director of the sustainable-technology and policy program at UCLA, the best alternative is professional wet cleaning. This process combines water with biodegradable cleaning agents in dedicated washers, dryers and pressers to wash apparel typically labeled “dry clean only.” He said wet cleaning can successfully wash 99.9% of garments previously dry cleaned, though many dry cleaners don’t like wet cleaning, which requires separate machines for washing and drying and a new set of skills. A 2011 study by

the New York State Pollution Prevention Institute showed that 71% of dry cleaners in New York think wet cleaning can't clean all garment types, and 65% said other solvents do a better job on certain clothes.

Symptoms vanish

Sinsheimer's research has shown that California dry cleaners who weaned themselves off perc and embraced wet cleaning reported that their persistent headaches or dizzy spells disappeared and their utility bills dropped. "With wet cleaning, you're talking about something that's better for the environment, makes people feel better and really cleans clothes well," he said. "Isn't that what we're after?"

One reason the public may not seek out professional wet cleaning more often is that care labels on clothes seldom recommend it. Those labels are regulated by the Federal Trade Commission, and Sinsheimer has long advocated that the agency add a wet-cleaning option when appropriate. "If apparel is labeled 'dry clean only' when it can be wet cleaned, that's deceptive to the customer," he said. The FTC held a hearing on the matter in 2014—it had conducted another back in 1999—but hasn't ruled yet. A spokesman said he had "no idea" when it might.

Meanwhile, perc abides.

"When we started working on this in the mid-1990s, I thought we'd fix everything in a few years," said Schreiber, the retired state science official. "A generation later, we're still trying to fix this. And another generation has been contaminated."

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