

Are your clients' skin cells gasping for air? Learn how to help them breathe easier.

# ENVIRONMENTAL CONTROL

By Liz Barrett

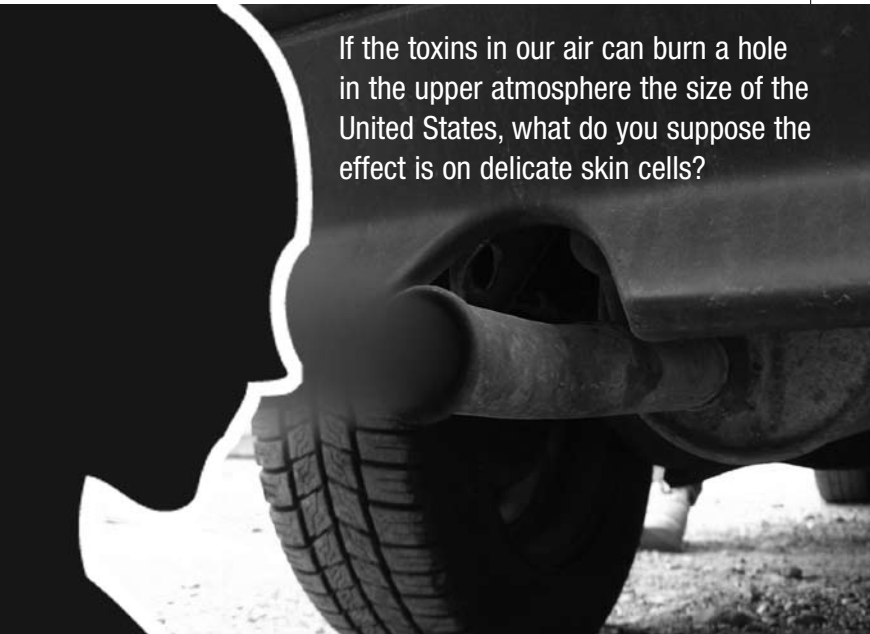
AFTER DECADES OF AVOIDING OVEREXPOSURE TO THE sun, another predator of our skin has been discovered lurking outside—one that can't be avoided by slathering on sunscreen, putting on a big hat or even retreating indoors. It's air—more specifically, airborne pollutants—and it's all around us, indoors and outdoors.

The essential element that all humans need to survive has become a topic of great discussion in the skin-

care field, with urban and even rural clients becoming more concerned at what this form of pollution can do to their skin. Recently, product chemists and researchers have begun looking for new ways to offset airborne pollution's skin-damaging effects. Getting the right information to your clients about their choices could make these products as vital as the sunscreen they use every day.

### A Particular Problem

Commonly blamed for discomfort in the throat, lungs and eyes, for the persistence of smog and for the depletion of the Earth's ozone layer, air pollution leads to the hospitalization of thousands of people each year, aggravating existing ailments such as bronchitis, chronic sinusitis and allergies. The number of asthma sufferers has doubled in the last decade in urban areas around the globe, and some claim that air pollution can burn lungs in the same manner that the sun burns skin.



If the toxins in our air can burn a hole in the upper atmosphere the size of the United States, what do you suppose the effect is on delicate skin cells?

If the toxins in our air, which include, among other things, a combination of sulfur dioxide, carbon monoxide and nitrogen dioxide, can burn a hole in the upper atmosphere the size of the continental United States, what do you suppose the effect is on delicate skin cells? A study conducted in 1997 by the University of California, Berkeley found that ground-level ozone in our atmosphere rapidly strips vitamin E from the uppermost skin layer, the stratum corneum, at a rate of 25% every two hours in heavily polluted urban areas like Mexico City and Los Angeles. An absence of vitamin E can lead to oxidation and degradation of the skin's barrier lipids and invite the formation of harmful chemicals that trigger an inflammatory response in the underlying skin layers. Researchers also noted in urban environments an increased aggravation of skin ailments such as atopic dermatitis, psoriasis and scaly skin.

## AIR SCARE

What's in the air that touches our skin? According to the U.S. Environmental Protection Agency (epa.gov), these are the most common airborne pollutants, with their long-term health effects:

**Ozone** (ground-level ozone is the principal component of smog)

**Source:** Chemical reaction of pollutants

**Health effects:** Breathing problems, reduced lung function, asthma, eye irritation, stuffy nose; reduced resistance to colds and other infections; may speed up aging of lung tissue

**Nitrogen dioxide** (smog-forming chemical)

**Source:** Burning of gasoline, natural gas, coal, oil, etc.; exhaust from cars is a main source

**Health effects:** Lung damage, illnesses of breathing passages and lungs (respiratory system)

**Carbon monoxide** (CO)

**Source:** Burning of gasoline, natural gas, coal, oil, etc.

**Health effects:** Reduces the ability of blood to bring oxygen to body cells and tissues; may be particularly hazardous to people who have heart or circulatory problems, or damaged lungs or breathing passages

**Particulate matter** (PM-10; dust, smoke, soot)

**Source:** Burning of wood, diesel and other fuels; industrial plants; agriculture (plowing, burning off fields); unpaved roads

**Health effects:** Nose and throat irritation, lung damage, bronchitis, early death

**Sulfur dioxide**

**Source:** Burning of coal and oil, especially high-sulfur coal from the eastern United States; industrial processes (paper, metals)

**Health effects:** Breathing problems; may cause permanent damage to lungs

**Lead**

**Source:** Leaded gasoline (being phased out); paint (houses, cars); smelters (metal refineries); manufacture of lead storage batteries

**Health effects:** Brain and other nervous system damage; digestive problems; children are at special risk, and some lead-containing chemicals cause cancer in animals

Industry experts have observed that as our air has grown worse, so has the condition of our skin as a whole. “More and more, we’re seeing people with itchy, irritated skin and prolonged acne lasting into their adult years,” says Patrick Sounigo, founder and chief formulator for SAMPAR ([sampar.com](http://sampar.com)). “Skin is designed to adapt to its environment, but when that environment is toxic, the skin can’t function normally.” Whenever the skin’s defense system is at risk and its ability to resist adverse factors in the environment is weakened, it begins to lose its radiance and look dull, adds Sami Toumi, president of Allegra M. France ([allegrafm.com](http://allegrafm.com)).

Clients of all ages should be concerned, but your baby boomer clients have even more reason to worry: According to Dr. Howard Murad, CEO of Murad ([murad.com](http://murad.com)), air pollution is one of the main causes of premature aging. Murad notes that pollutants in the air poison skin and result in reduced cell turnover and skin cell death that lead to premature aging. “If you aren’t protected, particles will sit on the skin and do continual damage,” says Murad. “You can’t get away from them like you can the sun’s rays.”

With all the toxins in the air, what defense does skin have against them? “Our most important layer of epidermal tissue is the barrier layer,” says Dr. Diana Howard, vice president of research and development for Dermalogica ([dermalogica.com](http://dermalogica.com)). “The barrier layer consists of lipids made up of ceramides, which are fatty acids and cholesterol. As long as this layer is kept strong, airborne toxins can’t break through to underlying layers.” Several things can weaken this layer, however, says Howard. “Something as simple as washing with soap and water, exfoliating too much or using products containing alcohol can leave skin in a fragile state.”

“Because our skin is an external organ, it’s constantly exposed to thousands of pollutants on a daily basis,” says Barbara Salomone, founder of Bioelements ([bioelements.com](http://bioelements.com)). “It’s impossible to target every damaging element, as they vary from multiple airborne toxins to smog and secondhand cigarette smoke, each one creating unstable free-radical molecules that weaken, damage and age the skin. In addition to shortening the life of skin cells, our skin’s natural oxidative enzymes such as superoxide dismutase are diminished.”

Philippe Allouche, M.D., president of Biologique



Air pollution is one of the main causes of premature aging.

## Can Air Pollution Cause SKIN CANCER?

You may not think of air pollution as something that would cause skin cancer, but indirectly, it can. According to the U.S. Environmental Protection Agency ([epa.gov](http://epa.gov)), around 90% of all ozone occurs in the ozone layer, a region 10 to 25 miles above the Earth’s surface. The ozone layer provides a barrier of protection against ultraviolet radiation coming from the sun. However, increased damage to the ozone layer is allowing more UV to reach the Earth’s surface. Because UV causes certain types of skin cancer, the EPA notes that ozone depletion will eventually lead to an increase in the number of skin cancer cases.

Recherche ([biologique-recherche.com](http://biologique-recherche.com)), notes that while the growth of high-tech delivery systems and nanotechnology is promising for care focusing on deeper levels of the skin, penetrating treatments often fail to offer comprehensive protection for the uppermost layers of the skin. Clients are left open to environmental airborne damage when deeply penetrating treatments and products are used without taking proper steps to protect the top layer of the skin.

### Air Repair

How can you help clients ward off the damage caused by environmental pollutants? “Strengthen the stratum corneum barrier from the outside in

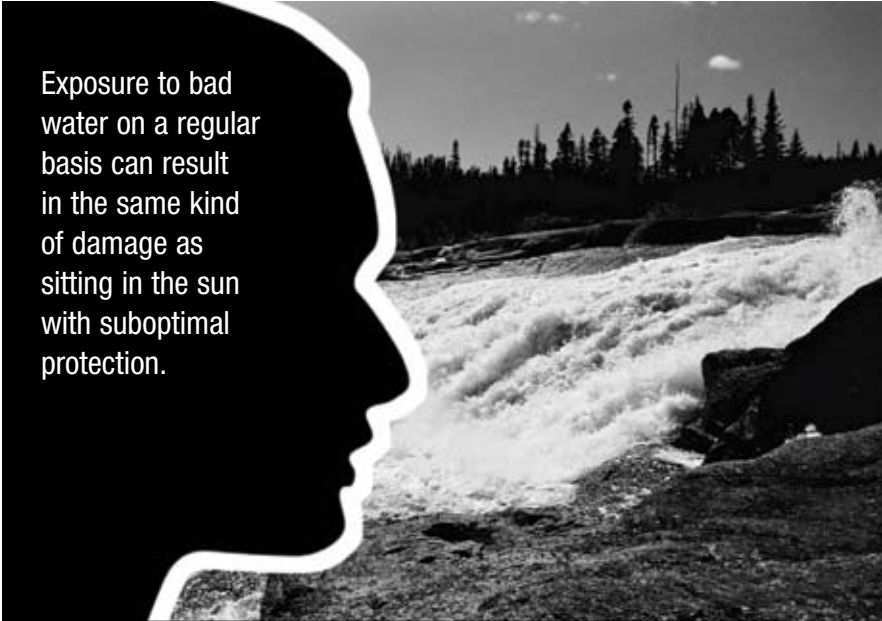
and inside out.” says Dr. Christian Jurist, global educational director for Pevonia ([pevonia.com](http://pevonia.com)). “The use of a filmogenic agent (barrier product) is essential, and skin must be drenched with neutralizing agents containing antioxidants and ingredients to strengthen skin’s immune system and tame inflammation.” Client recommendations of products with these ingredient functions can make a big difference in their skin quality.

**Hydration.** Hydrating ingredients are perhaps the most important component in helping to protect the skin’s barrier layer against outside pollutants. Skin that’s moisturized will better deflect chemicals looking to invade waiting cells. Whether it’s jojoba oil, hyaluronic acid or shea butter (which, according to Sounigo, also provides a dose of gallic acid to neutralize metals like carbon monoxide found in airborne pollution), moisture is the fundamental building block that helps skin cells protect themselves against external damage.

**Neutralization.** Several ingredients help neutralize the chemical pollutants found in smog. The goal of Murad’s CitySkin Detox Treatment with Anti-Pollution Complex is to use ingredients such as olive extract and manganese gluconate (both of which counteract pollutants and scavenge free radicals); epidermal growth factor and glycolic acid (both of which slough off dead skin cells and encourage healthy cells to replicate themselves); and lupine extract (to speed exfoliation and help maintain the skin’s barrier function).

Fumaric acid, present naturally in the body’s cells, but also found in fumitory, a European plant, centers on neutralizing ozone, but is also very stable with oxygen and other oxidizing agents, says Howard. Combined with lemon fruit extract, fumaric acid also forms a protective barrier. Dermalogica’s Anti-Ozonate Complex, containing these ingredients and found in the company’s Barrier Repair and Climate Control, was developed specifically to minimize the negative impact of ground-level ozone on the skin.

**Improved barrier function.** Many different ingredients can help strengthen barrier function, particularly those culled from plants. “While the capacity to extract from plants was very primitive 20 years ago, we now have the ability to



Exposure to bad water on a regular basis can result in the same kind of damage as sitting in the sun with suboptimal protection.

## WATER WORRIES?

As if air pollution wasn’t enough, Dr. Dennis Gross of MD Skincare ([mdskincare.com](http://mdskincare.com)) believes we should be concerned about the heavy metals, such as iron, copper, magnesium, lead and zinc, found in our water. According to Gross, these metals build up on the skin’s surface and cause problems such as acne, rosacea, irritation, inflammation, loss of collagen and premature aging. He notes that exposure to bad water on a regular basis can result in the same kind of damage as sitting in the sun with suboptimal protection, although to a lesser degree. The company’s Hydra-Pure line features a special Chelating Complex (an organic complex that engulfs and sequesters heavy metals on the skin’s surface) to combat the effects of heavy metal water pollution.

take exactly what we want from a plant and use what we’ve taken in larger concentrations in our products,” says Sounigo. Mint leaf in SAMPAR’s products works to stop skin irritation and inflammation, while milk and vegetal sugar increases the skin’s good bacteria and decreases bad bacteria. And Allegra M. France’s Soft 24 Velvet Cream uses lime extract, jojoba oil, rose hips oil, calophyllum oil, vitamin E, and soja and avocado insaponifiables to calm, decongest and re-equilibrate the self-defending barrier of highly reactive skin so that it can relearn how to fight off the harmful effects of pollution.

Vitamins also play an important role in barrier function. The Vitalliance emulsion from Allegra M. France uses vitamin A to stimulate the formation of



Products are reducing the damage done to skin and an increasing number of consumers recognize the need for protection.

## What's Your EXPOSURE?

The American Lung Association ([lungusa.org](http://lungusa.org)) recently ranked the air quality of cities across the United States in its State of the Air 2006 report, released last April. The top 10 best and worst cities for year-round, long-term particle pollution are listed here. Use the data to remind clients about the potential damage they face when leaving their skin unprotected.

### The 10 worst metropolitan areas for year-round particle pollution:

1. Los Angeles-Long Beach-Riverside, CA
2. Bakersfield, CA
3. Pittsburgh-New Castle, PA
4. Visalia-Porterville, CA
5. Fresno-Madera, CA
6. Detroit-Warren-Flint, MI
7. Hanford-Corcoran, CA
8. Cleveland-Akron-Elyria, OH
9. (tie) Birmingham-Hoover-Cullman, AL; Atlanta-Sandy Springs-Gainesville, GA

### The 10 best metropolitan areas for long-term particle pollution:

1. Cheyenne, WY
2. Santa Fe-Espanola, NM
3. Honolulu, HI
4. Great Falls, MT
5. Tucson, AZ
6. Anchorage, AK
7. (tie) Farmington, NM; Bismark, ND
9. Albuquerque, NM
10. Rapid City, SD

new cells while helping to avoid dead cell accumulation, vitamin E to neutralize free radicals, prevent moisture loss and oxygenate the cells, and vitamin B-5 to calm irritation caused by pollution. Urban Detox from Bioelements is formulated in a base of hyaluronic acid and dimethicone (a barrier strengthener) and includes topical antioxidants like vitamins A, C and E, and superoxide dismutase (a protective enzyme that reduces free-radical damage) to fight free radicals and strengthen skin's barrier function. (Grapefruit and lavender oils add antibacterial benefits.)

The late biologist Yvan Allouche, founder of Biologique Recherche, focused his interest on the biological mechanisms of living things that could survive in extreme conditions, and constantly looked for ways to use his findings to help heal the skin. In the company's proprietary Complexe VIP O2, he put perfluorodecalin, an oxygen carrier often used in artificial blood, to good use by binding it with essential fatty acids, glycol-proteins and amino acids. The resulting formula helps bind oxygen to the skin's surface, creating a breathable, protective film that enhances moisturization, encourages cellular regeneration and can carry oxygen and active ingredients into the skin.

Pevonia's Reactive Skin Care Cream and Marine Collagen Cream use an advanced base formulation with triphase W-O-W (water in oil in water) microemulsions, high-end technology from Europe that carries selective actives deeply and evenly into skin to stimulate cells to strengthen their own natural defense mechanisms against invading pollutants.

Despite the fact that measures are being taken to lessen air pollution, it will always be a threat. Fortunately, products are reducing the damage done to skin and an increasing number of consumers recognize the need for protection. This is where education from spa therapists is vital. "Hopefully our air quality will improve as our knowledge grows," says Salomone. "We have a few generations to work on it, and by that time, skin care could be wearing an entirely different 'face' than it does today." ●

**Liz Barrett** is an Oxford, Mississippi-based freelance writer and editor. She can be reached at [mslizbarrett@yahoo.com](mailto:mslizbarrett@yahoo.com).