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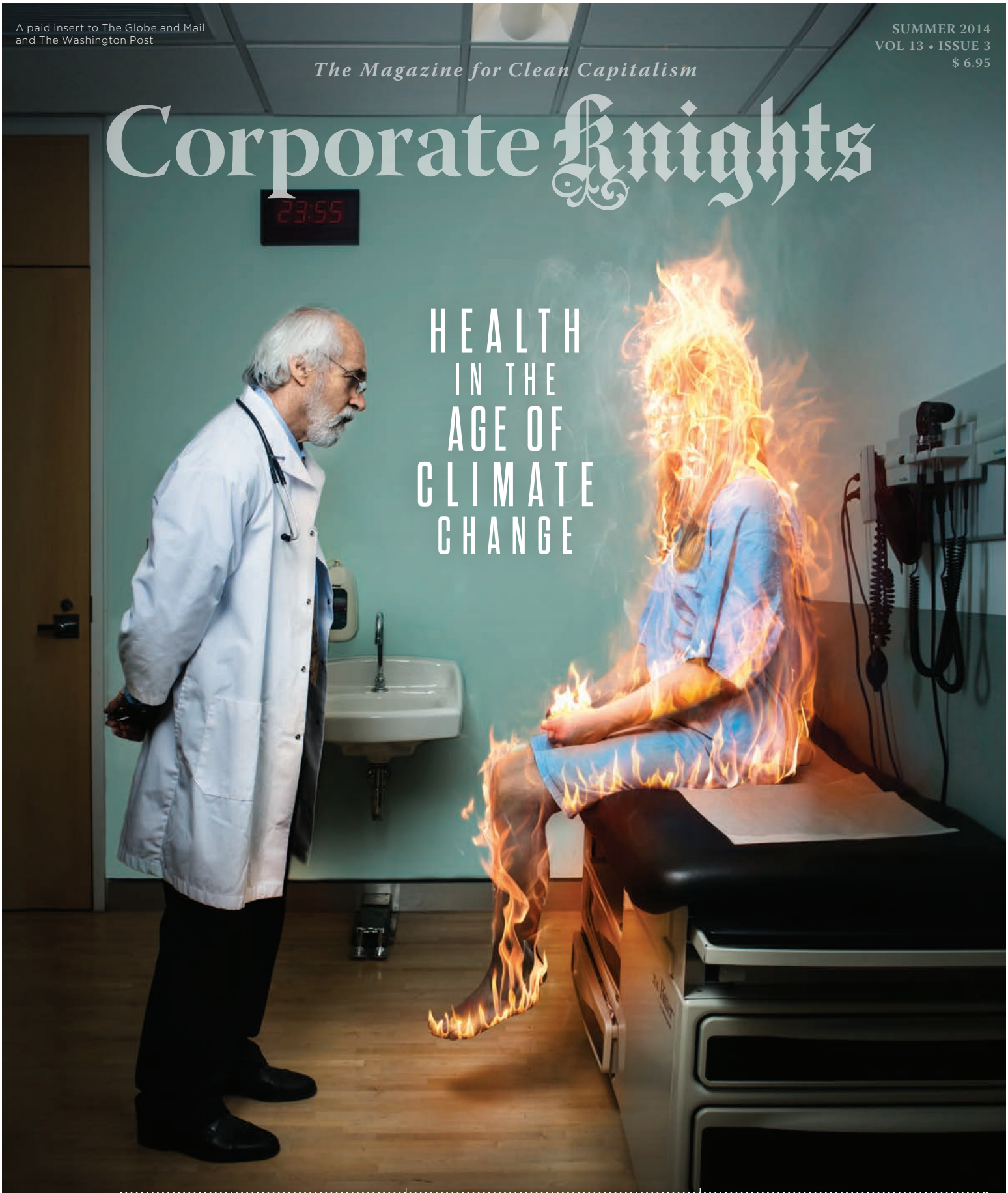
Corporate Knights



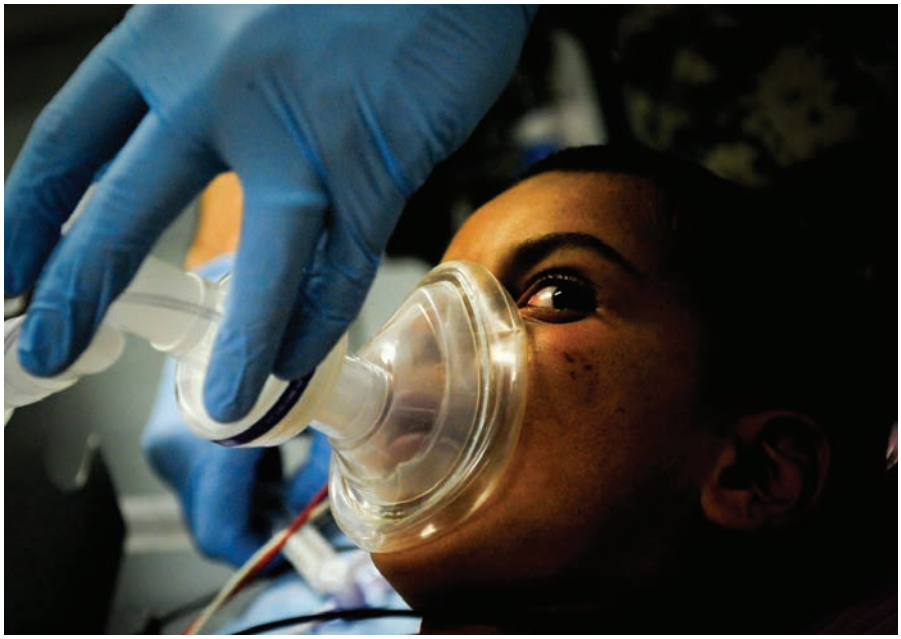
HEALTH IN THE AGE OF CLIMATE CHANGE

TECH SAVVY

BLUE-ZONE TECHNOLOGIES

Anesthesia is a medical miracle, but it's costly and poses a surprisingly serious threat to the climate.

By Adam Aston



Operating rooms are sites of some of our most advanced health technologies, where bodies are fixed and lives often saved. Yet for the climate, operating rooms are surprisingly unhealthful.

The culprit: gaseous anesthesia. When anesthetized, patients only absorb about 5 per cent of an administered dosage. The leftovers – roughly 95 per cent of the original volatile anesthetic – are routinely vented to the outside world where they act as greenhouse gases thousands of times more potent than carbon dioxide.

"It's a risk to the environment, and a terrible waste of money," says Dusanka Filipovic, who for 10 years has been building a business to fix this twin-barrelled problem. The Toronto-based firm she founded, Blue-Zone Technologies, is poised to begin large-scale commercial implementation of its Deltasorb technology, which captures and recycles anesthesia emissions.

When retrofitted onto the exhaust line of a conventional anesthetic gas system, the filter recaptures and absorbs the scavenged gases. In roughly 300 pilot sites in hospitals across Ontario, the service is already helping the planet by preventing these emissions from adding to our GHG problem.

And later this year, Blue-Zone will begin to help hospitals' bottom lines as well, by using the captured excess gases as a raw material to make and sell a generic, lower-cost supply of anesthetics, says Filipovic.

Inhaled anesthesia gases – the most common are desflurane, isoflurane and sevoflurane – are a miracle of modern medicine. They evolved from and replaced ether, the first form of inhaled anesthesia pioneered in the 1800s. Yet ether was so dangerous, it was a common cause of death during surgery.

Modern anesthesia gases, by comparison, have largely eliminated those risks, explains Stephen Brown, corporate chief of anesthesia with William Osler Health System, which operates two hospitals in Ontario.

"They allow a far finer degree of control," he adds, "lowering patient risk during surgery. And they cut the side effects and hangover afterwards," says Brown, who has overseen the installation of Deltasorb systems in three dozen operating rooms.

Though healthier for humans, modern anesthesia is making the planet sick.

Desflurane, the most widely used anesthesia, has global warming effects some 3,700 times greater than CO2. The gas inhaled typically includes a mix of similar agents, and is delivered via a flow of a mix of oxygen and nitrous oxide, which is also a potent GHG.

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For every hour of surgery, the effects of these gases add up to the equivalent of hundreds of miles of driving. Taken together, worldwide emissions of inhalation anesthetics have a climate impact on par with a single coal-fired power plant, or more than 1 million passenger cars, according to a 2010 study in the *British Journal of Anaesthesia*.

Blue-Zone is already helping to tug that toll down thanks to its bread-loaf sized canisters. Retrofitted onto the exhaust pipes of anesthesia systems, the reusable canisters are filled with a proprietary material that absorbs the volatile anesthesia gases exhausted by the anesthetic system. Blue-Zone technicians routinely pick them up from the hospitals and replace them with refills.

The fee? About $150 per month. At less than $5 per day, that's "not a significant cost barrier," says Brown. Hospitals receive a monthly report on the amount of gas recaptured and what that works out to in terms of CO2-equivalent GHG emissions.

Returned to Blue-Zone's facility in Concord, Ontario, the filter packs are processed to recover accumulated anesthesia, which is then processed into generic anesthetic agents and packaged for resale.

Filipovic is excited by the opportunity to offer a lower cost alternative for gaseous anesthesia, for which the market is highly concentrated. Worldwide, just two factories – in Japan and Puerto Rico – produce these life-saving gases, which makes them not only costly but vulnerable to supply disruption.

As yet, however, there are no regulations in Canada or other major countries forcing hospitals to curb anesthesia emissions.

Photo courtesy of NATO International Security Assistance Force