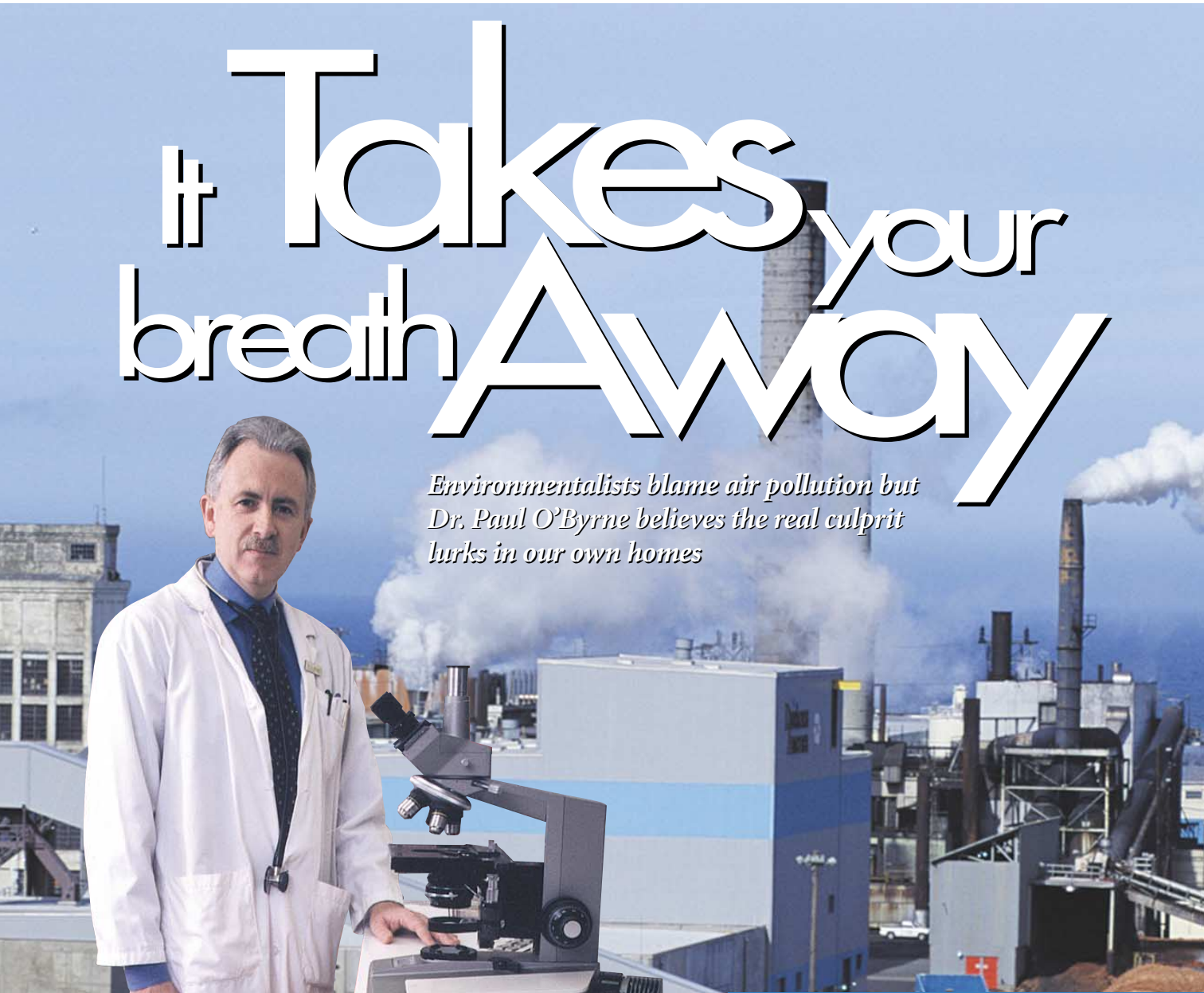
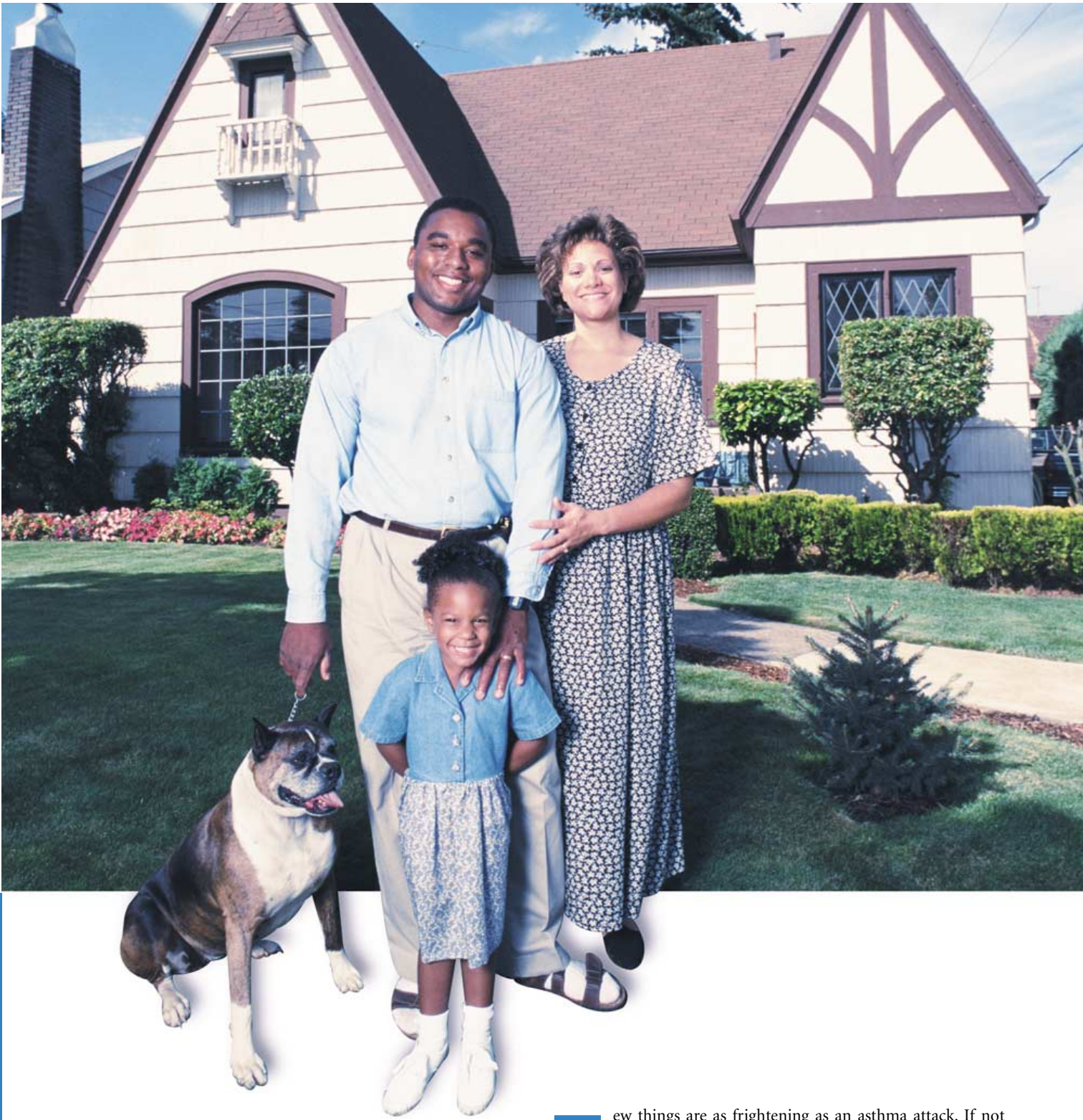
It Takes your breath Away

Environmentalists blame air pollution but Dr. Paul O'Byrne believes the real culprit lurks in our own homes



Over the last decade, the prevalence of asthma, a chronic obstructive lung disease marked by wheezing and shortness of breath, has jumped by almost 40%. Environmentalists claim that air pollution is to blame – but is it?



Few things are as frightening as an asthma attack. If not treated promptly, the sufferer descends into an airless hell that can be fatal. But despite our modern technology – or, some people would argue, because of it – asthma diagnoses and deaths are increasing each year. In Canada, the number of people diagnosed with asthma has doubled since 1970, climbing to over 2 million men, women and children.

The popular theory in many quarters is that asthma is nature's payback for generations of abuse to our planet. And indeed, the rise in asthma rates appear to parallel the rise in air pollution. But Dr. Paul O'Byrne, director of Cardio-Respiratory Services at

What is asthma?

- During an asthma attack, the smooth muscles of the small airways in the lungs (called bronchi) go into spasm and constrict. At the same time, tissues lining the bronchi swell from inflammation and secrete mucus. The result is a sometimes dangerous narrowing of the diameter of the airways, leaving the victim struggling to breathe
- There are two ages during which asthma is more likely to be diagnosed: young children age 2-5 and adults age 30-50. In childhood, boys outnumber girls. Among adults, males and females are more equally represented. However, asthma can develop at any age. Dr. O'Byrne has even diagnosed new asthma in a 70-year-old.
- Many childhood asthmatics experience the virtual disappearance of their symptoms during puberty. However, the asthma may re-occur later in adult life.
- Adult asthma can be triggered by workplace exposure to chemicals from cedar and certain elements used in the plastics, foam and paint industries.
- Allergies and asthma tend to run in families. However, if one twin has asthma there is only a 50% chance that the other twin will also have it. This suggests that asthma is polygenetic (i.e., involves more than one gene).

McMaster University, sees "air pollution as the trigger of asthma" as a one-size-fits-all theory that doesn't hold up to scrutiny. A study conducted just after reunification of the two Germanys, for example, found that asthma rates did not significantly differ – despite the fact that air pollution was far greater in East Germany. Similar results from other countries have convinced Dr. O'Byrne that although air pollution may contribute to the problem, the real culprit lies much closer at hand.

"In most individuals, asthma is the result of a genetic predisposition to allergic reactions combined with exposure to allergins," he explains. "It is indoor air quality that has the greatest impact on whether or not someone with the genetic predisposition develops asthma – and how well they manage their condition."

Dr. O'Byrne estimates that about a third of Canadians have the genetic potential to develop allergies. Out of these, about a third will go on to develop the condition. Living in an air tight, energy-efficient home with wall-to-wall carpeting and family pets

opposite page:
Most asthmatics can lead normal, active lives – if they take their medications and follow a few sensible guidelines

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Asthma is one of the leading causes of admissions to children's hospitals – and of parental work absenteeism

increases the risk, primarily due to the build up of common allergins such as dust mites, pet dander and cigarette smoke. Which can help to explain why affluent neighbourhoods often have higher asthma rates than their less-affluent counterparts with older, more drafty housing.

Knowing that indoor air quality is an important key to the development and course of asthma should make it easier to prevent and control it. However, making the necessary changes (see Taking Control) can be resisted by even the best, most loving families. Giving away the family pet, for example, can be a heart-wrenching decision. And up to half of Canadian parents can't resist smoking in the home, exposing asthmatics (and others) to second-hand smoke.

In his practice, Dr. O'Byrne (an asthmatic himself) has found that many parents resist the diagnosis of asthma for fear it means a life-long sentence of restricted activities and lost opportunities. But if appropriate medical care is followed and reasonable adaptations made, most asthmatics can enjoy normal, active lives. After all, many Olympic athletes, such as marathoner Peter Maher, cyclist Curt Harnett, and runner Charmain Crooks, have asthma.

Much of the current optimism about asthma is due to the existence of effective and safe medications. For the immediate treatment of an asthma attack, beta-adrenergic receptor agonists are commonly used, usually in the form of "puffers" or inhalers. They act as on certain receptors found on cells in the lungs and can quickly relax and widen the airways. Because the receptors are found almost exclusively in the lungs, these drugs have few side effects.

Long-term therapy is usually in the form of corticosteroids. Although concern has been expressed about long-term use of steroid-based medications in children, Dr. O'Byrne notes that the dose of inhaled steroids is very low and should be considered safe. Moreover, long-term use of corticosteroids reduces the likelihood of future attacks.

What does the future hold? New drugs or those currently in development include such exotic-sounding agents as long-acting beta-adrenergic receptor agonists, anti-leukotrianes and an interluekin-5 blocker. Many of these agents concentrate on the immune system.

But the biggest progress may not require new drugs at all. Rather, a new approach to managing the condition may prove to have significant, long-term benefit. With support from Astra Pharmaceuticals, Dr. O'Byrne and a group of international collaborators have launched a 5-year, 30-country study called START (Steroid Treatment As Regular Treatment). The goal of the START trial is to see if consistent use of corticosteroids right from the time of diagnosis can prevent the disease from progressing as the person ages.

"There is good retrospective data to suggest that if the asthma is controlled early, there is less scarring and permanent damage to the lungs," Dr. O'Byrne explains. "The START trial will give us the sort of accurate, prospective data we need to prove whether this is true."

Taking Control

Although the number of Canadians who die from asthma each year is relatively small (20 children and 500 adults) it has been estimated that 80% of these deaths could have been prevented by effective treatment and control. Asthmatics can help to reduce their risk of attacks by following a number of simple guidelines.

- Compliance with asthma medications is critical. Make sure you understand how and when to take your medications. If you have an inhaler ("puffer"), keep it close at hand and accessible at all times.
- In the bedroom, remove carpets and upholstered furniture, enclose the mattress and box spring in dust-proof covers and use synthetic pillows.
- Ban pets from the bedroom of the asthmatic.
- Use dehumidifiers to prevent the development of mold. Remember to clean them frequently.
- Keep windows closed during pollen season; use air conditioning if possible.
- Disinfect showers and bathtubs frequently.
- Declare the house a "smoke-free zone." Ask guests to respect your ban.
- Avoid using hair sprays and aerosols.

The Bottom Line

- Asthma is responsible for over half a billion dollars a year in direct and indirect costs. Given the increasing prevalence of asthma, these costs are expected to continue rising.
- For children, asthma is one of the most common causes for admission to a children's hospital and of school absenteeism.
- Parents of asthmatic children frequently report having to take time off work to tend to their children.
- In the United States, the cost of asthma in 1990 was estimated to be $6.2 billion.