Investment in research saves lives and money

Allergies

An allergy is a chronic illness involving an abnormal immune system reaction to an ordinarily harmless substance called an allergen. Allergies can be triggered by a wide range of allergens, some of the most common being specific medications, pollen, dust mites, mold and insect stings.

Today:

- More than 50 million Americans, or 1 in 5, suffer from allergies.
- Skin reactions, including hives, psoriasis, and eczema, affect nearly 12% of children in the U.S.
- Allergies are the sixth leading cause of chronic illness in the U.S.
- Every year, over one-tenth of American children report having respiratory allergies, often referred to as allergic rhinitis (AR).
- The majority of allergy symptoms are not life-threatening. However, anaphylaxis, the most severe symptom, affects at least 1.6% of the general population and can result in the closing of airways or cardiac arrest.
- An estimated 1.6 million adults have some form of eczema in the U.S.
- Children with allergies are twice as likely to develop heart disease later in life compared to children without allergies.

SAVING LIVES

HOW RESEARCH SAVES LIVES:

- Studies have concluded one-fourth of anaphylaxis incidents where epinephrine was administered at school occurred with children who were unaware of their allergy at the time of the reaction. With this knowledge, 41 states have implemented stock epinephrine laws to ensure access to this life-saving drug during emergencies. In Chicago public schools alone, stock epinephrine was used 38 times in a single school year to treat anaphylaxis.

SAVING MONEY

HOW RESEARCH SAVES MONEY:

- Immunotherapy is currently the only treatment that targets the root cause of allergies, by desensitizing an individual’s immune system to a specific allergen through a slow build-up of exposure. In children under 18, studies have shown that immunotherapy reduces overall health care costs by 33%, cutting outpatient health care costs by nearly 60% for some patients.
- The access and availability of over the counter (OTC) medications to treat the symptoms of allergies results in an annual savings of $14.2 billion in avoided clinical care and prescription drug cost savings.
- One-tenth of Americans report a penicillin allergy, yet only 5% of these individuals have a true allergy. A retrospective analysis found that those who report a penicillin allergy, and subsequently receive an alternative treatment, experience poorer health outcomes, including a 9.9% increase in length of hospital stay and up to a 30.1% increase in resistant infections. Researchers concluded if a penicillin allergy test was performed to identify those with a true allergy, over $55 million could have been saved in the direct medical costs associated with the 5,182 patients in the study cohort.

The Cost:

- Eye allergies, like allergic conjunctivitis, affect 40% of Americans at some point in their lifetime. The direct medical costs of treating eye related allergy symptoms is nearly $6 billion annually.
- The annual economic burden of allergic rhinitis (AR) is estimated to be more than $11 billion.
- The economic burden of psoriasis, a chronic inflammatory skin allergy, is estimated to be $23.4 billion per year.

NAME: Rachel Weissman
AGE: 22
CONDITION: Allergies and Eczema

In middle school, Rachel developed eczema, an immune disorder which resulted in itchy and painful patches of inflammation on her face and extremities. Severe respiratory allergies and several food allergies slowly presented throughout high school.

While in college at Brandeis University, Rachel was confronted with a rare allergy to silicon, which was diagnosed after she developed hives on the inside of her eyelids from contact lenses. Rachel then discovered the major exaspators to her eczema were silicone-based products she used daily. Silicone derivatives are a base ingredient for many soaps, hair products, makeup, moisturizer, and, ironically, some eczema treatments. This knowledge allowed her to proactively avoid any products containing silicone, which, while very challenging, provided significant relief from her symptoms.

To control her allergy symptoms, Rachel takes daily prescribed allergy medication and uses strong topical steroids. She will be the first to tell you that, while bothersome and painful, her conditions are not life-threatening and she is lucky to have a clear diagnosis. However, the lack of treatment options for managing these allergies places frustrating limits on her day-to-day life.

In 2015, Rachel graduated college after double majoring in Biology and Health Policy and double minoring in Chemistry and Sculpture. She has since become an active advocate for basic research: “There are so many gaps in our knowledge of the immune system. It doesn’t seem very efficient to try to treat something we don’t completely understand.” She also believes increased research into allergies will result in novel information about immunology that could impact other conditions that interact with the immune system, including life-threatening diseases, like HIV/AIDS and cancer.

* CENTER FOR DISEASE CONTROL AND PREVENTION <WWW.CDC.GOV>
+ AMERICAN ACADEMY OF ALLERGY AND ASTHMA & IMMUNOLOGY, 2013.
● LINDSTROM, R. ET AL. EYE WORLD, 2011.
Hope for the Future:

- Sanofi and Regeneron are taking their new eczema treatment into phase III trials after very positive results in earlier double-blind placebo trials. The biologic agent, dupilumab, is directed towards a completely novel target, which results in the blocking of the ‘type 2 helper T-cell’ mediated inflammation causing the irritation and discomfort experienced by those with eczema. Trial participants who received dupilumab experienced a 20% to 80% reduction in their Eczema Area and Severity Index (EASI) score, compared to their baseline score before beginning the treatment regimen.*

- The University of Iowa is currently developing a novel vaccine to treat dust mite allergies. This vaccine, which deploys a nano-sized particle delivery model to boost efficacy, was shown to reduce lung inflammation in animal models by 83%, even after repeated exposure.*

- Researchers at the University of Texas Medical Branch at Galveston have identified a mechanism that plays a large role in the development of ragweed pollen allergies. In reaction to the allergen, the researchers observed the recruitment of neutrophils, a type of white blood cell, and their interaction with a protein called chemokines in the airways causing inflammation. This new insight into the mechanisms behind the observed allergy symptoms identify a possible novel target for researchers when developing future therapies.^

The Bottom Line:

Allergies greatly impact patients’ quality of life and overall health and wellness. The majority of available treatments simply seek to mask allergy symptoms, rather than targeting the root cause--making them insufficient in addressing the suffering of tens of millions of Americans. Increased research is desperately needed to understand the cause of allergies and develop effective and safe treatments for this massive unmet medical need.

Percentage of Children Under 18 with Respiratory Allergies Between 2012 and 2014, by region

Source: Centers for Disease Control and Prevention

* National Eczema Association <nationaleczema.org>
+ The University of Iowa <now.uiowa.edu>