

8. **Chest radiography** (if the patient is elderly or physical findings suggest pneumonia)
9. **Bronchoscopy** (to exclude foreign body aspiration, tuberculosis, tumors, and other chronic diseases)
10. **Influenza tests**
11. **Laryngoscopy** (to exclude epiglottitis)

## Lecture No. 21-22

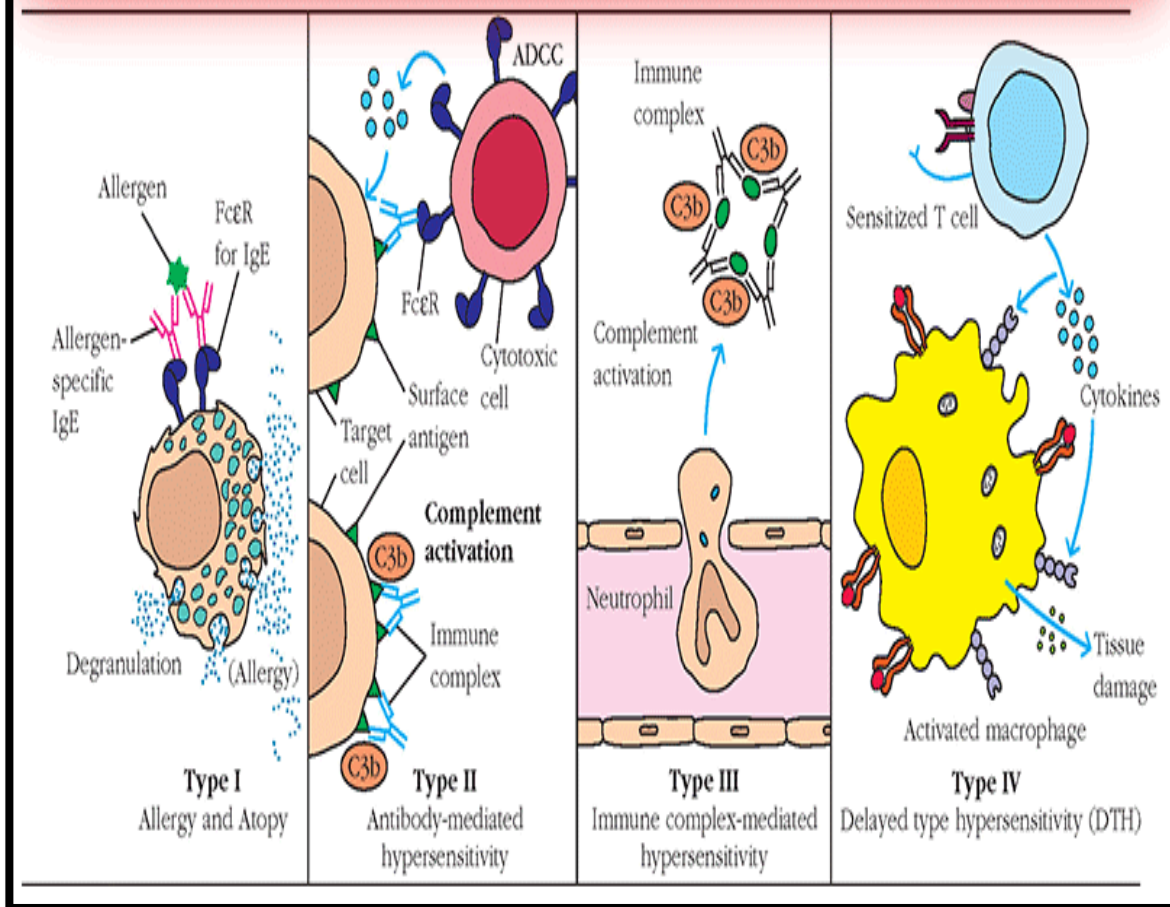
### **Hypersensitivity**

**Hypersensitivity**, which is defined as an **exaggerated response** to atypically **harmless antigen** that results in **injury** to the tissue, **disease**, or even **death**. Antigens that trigger allergic reactions are called **allergens**.

### **Classification of hypersensitivity reactions:**

Table 26-1 Classification of Hypersensitivity Reactions				
Parameter	Type of Reaction			
	I	II	III	IV
Reaction	Anaphylactic	Cytotoxic	Immune complex	T cell-dependent
Antibody	IgE*	IgG, possibly other immunoglobulins	Antigen-antibody complexes (IgG, IgM)*	None
Complement involved	No	Yes*	Yes*	No
Cells involved	Mast cells, basophils, granules (histamine)*	Effector cells (macrophages, polymorphonuclear leukocytes)*	Macrophages, mast cells	Antigen-specific T cells
Cytokines involved	Yes*	No	Yes*	Yes (T cell cytokines)*
Comparative description	Antibody mediated, immediate	Antibody dependent; complement or cell mediated	Immune complex mediated (immune complex disease)	T cell-mediated, delayed type
Mechanism of tissue injury	Allergic and anaphylactic reactions	Target cell lysis; cell-mediated cytotoxicity	Immune complex deposition, inflammation	Inflammation, cellular infiltration
Examples	Anaphylaxis Hay fever  Asthma Food allergy	Transfusion reactions Hemolytic disease of newborn Thrombocytopenia	Arthus reaction Serum sickness  Systemic lupus erythematosus	Allergy or infection Contact dermatitis

# Type I vs Type II vs Type III vs Type IV



## Testing of Hypersensitivity

### 1. In Vitro Tests: Total IgE

Testing Principles In vitro tests involve measurement of either **total IgE** or **antigen-specific IgE**. These are **less sensitive** than **skin testing** but usually are **less traumatic** to the patient. **Total IgE testing** has become **more important** as a **screening** test before a patient is referred to an allergy specialist. Total serum IgE testing is used clinically to aid in **diagnosis** of **allergic rhinitis**, **asthma**, or other allergic conditions that may be indicated by patient symptoms

### 2. Antigen-Specific IgE Testing

The original commercial testing **method** for determining **specific IgE** was known as the **radioallergosorbent test (RAST)**, introduced in 1966. Principles of the test remain the same, **but newer testing methods** involve the use of **enzyme or fluorescent labels** rather than **radioactivity**. **Allergen-specific IgE** testing is **safer** to perform than **skin testing** and is easier on some patients, especially children or apprehensive adults, and the **sensitivity** **now** approaches that of **skin testing**. It is especially useful in **detecting allergies** to

common triggers such as ragweed, trees, grasses, molds, animal dander, milk, and egg albumin.

**3. The patch test** is considered the gold standard in testing for contact dermatitis. This must be done when the patient is free of symptoms or when he or she at least has a clear test site. A nonabsorbent adhesive patch containing the suspected allergen is applied on the patient's back, and the skin is checked for a reaction over the next 48 hours. Redness with papules or tiny blisters is considered a positive test. Final evaluation is conducted at 96 to 120 hours. All readings should be done by a skilled evaluator. False negatives can result from inadequate contact with the skin.

**4. Skin testing** can be performed by a skin puncture test (SPT) to assist in the identification of foods that may provoke IgE-mediated, food induced allergic reactions

**5. MELISA (Memory Lymphocyte Immunostimulation Assay)** is a blood test that detects type IV hypersensitivity to metals, chemicals, environmental toxins and molds. Type IV hypersensitivity reactions, particularly to nickel, are well established and may affect 20% of the population

**6. The oral food challenge (OFC)** remains the gold standard for the diagnosis of food allergy. During the OFC, a standard serving size of the allergen is divided into 4–7 servings and administered over 60–90 minutes, with each dose being given 15–20 minutes apart. The initial amount fed to the patient is typically a very small proportion of the total serving, and each successive dose administers a larger amount of protein. At the first sign of an objective reaction, the OFC is stopped and appropriate treatment administered



