

CLINICAL SPECIFICATIONS

ISOCYANATE

Chemical Found In:

Isocyanates are a family of highly reactive, low molecular weight chemicals widely used in the manufacture of foams, fibers, paints, varnishes and elastomers, and are increasingly used in the automobile industry, autobody repair, and building insulation materials. Many spray-on polyurethane products contain isocyanates and are used privately and commercially to protect cement, wood, fiberglass, steel and aluminum.

Sources:

<http://www.cdc.gov/niosh/topics/isocyanates>

Known Cross-Reactions:

Clinical Significance:

The detection of antibodies to Isocyanate bound to human protein in serum indicates a breakdown in immunological tolerance and induction of chemical intolerance. Isocyanate or its metabolites can bind to human tissue proteins and form neo-antigens. These new antigens are comprised of the haptenic chemical plus the tissue antigen. The formation of neo-antigens initiates an immune response which may result in antibody production against the chemical and the human tissue. Continued exposure to the chemical and the subsequent production of antibodies against various tissue antigens, may result in autoimmune reactivity.

Persons with antibodies to Isocyanate bound to human protein in serum should avoid exposure to the substance.

References:

1. Dragos, et al. Specific antibodies to diisocyanate and work-related respiratory symptoms in apprentice car-painters. *Occup Environ Med*, 2009; 66:227-234.
2. Hur, et al. Update on the pathogenic mechanisms of isocyanate-induced asthma. *World Allergy Org J*, 2008; 15-18.
3. Hur, et al. Tissue transglutaminase can be involved in airway inflammation of toluene diisocyanate-induced occupational asthma. *J Clin Immunol*, 2009; 29(6):786-794.
4. Orloff, et al. Antibodies to toluene diisocyanate in an environmentally exposed population. *Environ Health Perspect*, 1998; 106:665-666.
5. Palikhe, et al. Biomarkers predicting isocyanate-induced asthma. *Allergy Asthma Immunol Res*, 2011; 3(1):21-26.
6. Park, et al. Longitudinal study of specific antibodies to toluene diisocyanate (TDI)-human serum albumen (HSA) conjugate in patients with TOI-induced asthma. *Korean J Intern Med*, 2002; 17(4):249-251.