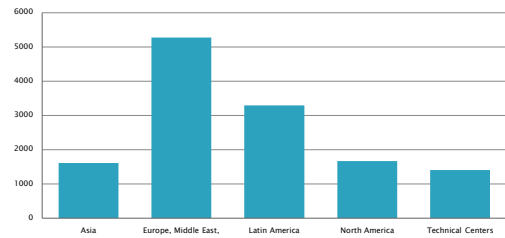


Enzyme Medical Monitoring Systems in Detergent Manufacturing

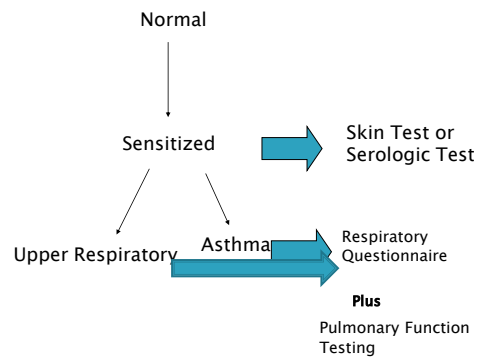
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Fulltime P&G Enzyme Exposed Employees Oct 2011



Objectives of a Health Surveillance System

- ▶ Protect individual health by detecting at early stage adverse changes
- ▶ Assisting in evaluation of exposure control measures
- ▶ Collecting data to detect and evaluate hazards to health



Employees Working with Enzymes – Pre-placement Testing

- ▶ Medical History with particular reference to Allergy, Asthma, Lung diseases and medication
- ▶ Respiratory Questionnaire
- ▶ Baseline Lung Function Assessment
- ▶ Skin Prick Test to all enzymes in use
- ▶ Physical Examination at discretion of the Occupational Physician

Basic tools in Annual Medical Monitoring

- ▶ Respiratory Questionnaire
- ▶ Pulmonary Function Test
- ▶ Skin Prick Test Monitoring

Respiratory Questionnaire

- ▶ Good description of symptoms
- ▶ Sometimes employees need assistance in completing
- ▶ Used pre-placement and periodic examinations
- ▶ ATS-DLD-78 recommended adult questionnaire (see references)

Spirometry

- ▶ American Thoracic Society/European Respiratory Society :
 - "General Considerations for Lung Function Testing" 2005
 - "Standardization of Spirometry" 2005
- ▶ Forced expiratory maneuver
- ▶ Test indices FVC, FEV1, FEV1 /FVC ratio, PEFR
- ▶ Reproducible tests
- ▶ **Quality Assurance:** Periodic review of PFT quality by third party reviewer
 - Must meet PFT quality standards

Immunological Tests

- ▶ Demonstrate development of specific IgE, i.e. immunological response following exposure to allergen
- ▶ Immunological response does **not** mean disease
- ▶ Tests:
 - Skin Prick Test
 - Serological Test Procedures

Skin Prick Test

- ▶ Performed by trained and competent health care provider
 - *Global Standard Operating Procedure*
 - *Global qualification*
- ▶ Negative (saline, to identify non-specific reactions)
- ▶ Positive controls (histamine, to confirm normal skin reactivity)
- ▶ Standardized reagents



Serological Test Procedures

- ▶ Most common RAST, UniCAP, ELISA
- ▶ Blood collection, venipuncture
- ▶ Only accredited laboratory can be used
- ▶ Quantitative results

Advantages of Prick Test

- ▶ Less invasive than serology
- ▶ Immediate results
 - *Demonstrates a physiologic reaction can occur*
- ▶ Inexpensive

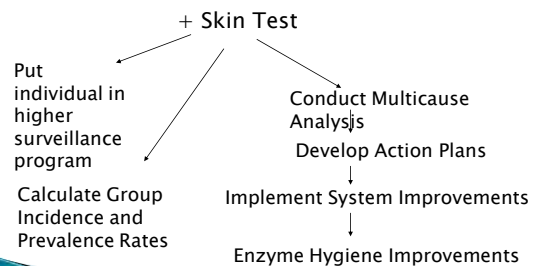
Advantages of serology test

- ▶ Quantitative results
- ▶ Usable with patients taking antihistamines
- ▶ Usable in individuals with skin diseases

Skin Testing Results

- ▶ Identify those more at risk for developing enzyme rhinitis and asthma
- ▶ Primary outcome measure of process to control exposures to enzymes in the workplace (P&G uses a **<3% incidence rate standard**)
- ▶ Trigger a “Multi-cause Investigation” to identify areas of improvement

Positive Skin Test Results



References

- ▶ American Thoracic Society/European Respiratory Society “General considerations for lung function testing.” *Eur. Respir. J.* 26:153–161 (2005).
- ▶ American Thoracic Society/European Respiratory Society – “Interpretative Strategies for Lung Function Tests”, *Eur Respir J* 2005; 26: 948–968,.
- ▶ The ATS–DLD–78 recommended adult questionnaire is taken from pages 10–23 of the reference (*Am Rev Respir Dis* 1978;118).