

Medical Monitoring and Surveillance

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Goals

- Secondary prevention with screening
 - Identify abnormalities early to stop progression
 - Sentinel cases warn of co-worker risk
- Primary prevention with surveillance
 - Identify risk factors for intervention
 - Evaluate effectiveness of intervention

Characteristics of Disease

- Asymptomatic in many
- Onset often early in employment
- Very rapid declines in lung function
- Irreversible and untreatable
- Excessive declines in FEV1 are exposure-related and imply risk of developing abnormality

Components of Monitoring

- Questionnaire
- Spirometry at 3-6 month intervals
- Assessment of excessive FEV1 declines
- Follow up and referral of abnormal
- Analyses of screening data for risk factors

Surveillance Needs

- Analyses of risk factors
 - Do excesses of abnormalities exist over-all?
 - Do differences exist among subgroups?
 - Do abnormalities concentrate in subgroups?
- Provision for transferring screening data to subsequent provider
- Interventions to lower exposure as needed

Preventive Paradigm

- Identify pre-clinical effects for intervention
- Questionnaire for job/task/personal protective equipment usage
- Serial spirometry for early identification of workers with abnormal decline
- Medical monitoring triggers multidisciplinary follow back to the workplace

Rapid Lung Function Decline

- Average normal decline is about 30 ml/year
- Excessive decline criteria depend on spirometry quality
- Evaluate printouts of the three best curves in a session for repeatability and plateau
- Commercial spirometry is commonly inadequate in quality for assessing rapid decline

Obtaining Good Quality Spirometry

- Spirometer equipment and reporting specifications
- Training in NIOSH-approved spirometry course
- Performance-based technician certification
- Ongoing review of reported data for quality
- Independent audits and contractual specifications for quality

Tools for Assessing Excessive Decline

- ATS and ACOEM guidance: 15% plus annual expected decline
- Healthy worker population-based estimates: up to about 10% in first year
- SPIROLA freeware from NIOSH
- Contractual attention and worker consent to transfer serial spirometry to new providers

Implications of Excessive FEV1 Decline

- Abnormal FEV1 declines associated with indices of flavoring exposure
- Serial spirometry identifies additional workers as potentially affected who are still normal
- Repeat spirometry, medical evaluation, and careful follow up needed to avoid progression
- Industrial hygiene consultation/intervention

Tools for Surveillance

- High participation rate in monitoring
- Over-all excesses can be compared to national data on symptom and spirometric abnormality
- Questions about area, job, tasks, practices
- Internal comparisons may identify high risk subgroups
- Interventions can be evaluated for effectiveness over time

Summary

- Medical monitoring is a safety net since many flavoring chemicals are unregulated and regulations will not protect all workers
- Prevention of impairment for irreversible disease requires attention to excessive FEV1 decline
- Spirometry quality requires improvement over usual practice
- Primary prevention requires an epidemiologic approach to screening data: i.e. surveillance