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 abnormals
- 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