Das Asthma bronchiale am Arbeitsplatz

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Abteilung Arbeitsmedizin
Arbeitsplatz-assoziiertes Asthma: Abklärung, Diagnose und Management

David Miedinger, Hanspeter Rast, Susanna Stöhr, Marcel Jost
Suva, Abteilung Arbeitsmedizin, Luzern

Quintessenz

- Bei allen arbeitenden Asthmakern muss ein möglicher Zusammenhang der Asthmasymptome mit der beruflichen Tätigkeit beurteilt werden.
- Für die Krankheitsprognose ist vor allem die Zeitspanne entscheidend, in der Arbeitnehmende mit Asthmasymptomen am Arbeitsplatz exponiert bleiben.
- Die spezifische Bronchoprovokation gilt heute als Referenzstandard für die Diagnose der „Sensitizer-induced“-Form des Berufsasthmas.

Der vorliegende Artikel befasst sich ausschliesslich mit der SIA-Form des Berufsasthmas. Informationen betreffend der IIA-Form finden sich als Factsheet auf der Webseite der Suva, Abteilung Arbeitsmedizin (www.suva.ch).

Epidemiologie

In der Schweiz gehören Erkrankungen der Atemwege zu den häufigsten Berufserkrankungen. Verschiedene Untersuchungen haben gezeigt, dass in etwa einem von sechs...
Overview

- Definitions
- Frequency
- How to diagnose OA
- Consequences
- Prevention of OA
American College Of Chest Physicians Consensus Statement

Work-related asthma (WRA)

Occupational asthma, caused by work (OA)  Work-exacerbated asthma (WEA)

Sensitizer-induced OA  Irritant-induced OA (Including reactive airways dysfunction syndrome, RADS)

These groupings are not mutually exclusive; e.g. OA can be followed by WEA

Tarło SM, Chest, 2008
Definition of OA

«… a disease characterized by variable airflow limitation and/or hyper-responsiveness and/or inflammation due to causes and conditions attributable to a particular occupational environment and not to stimuli encountered outside the workplace. »

Bernstein, et al. Asthma in the Workplace, 2006
## Classification of OA

<table>
<thead>
<tr>
<th></th>
<th>Sensitizer-induced OA</th>
<th>Irritant-induced OA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IgE-dependent</td>
<td>IgE-independent</td>
</tr>
<tr>
<td><strong>Clinical</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interval between</td>
<td>Longer</td>
<td>Shorter</td>
</tr>
<tr>
<td>onset of exposure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>and symptoms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pattern of asthmatic</td>
<td>Immediate, dual</td>
<td>Late, atypical</td>
</tr>
<tr>
<td>reaction on specific</td>
<td></td>
<td></td>
</tr>
<tr>
<td>inhalation testing</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Epidemiologic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevalence in</td>
<td>&lt;5%</td>
<td>&gt;5%</td>
</tr>
<tr>
<td>exposed population</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Host predisposition</td>
<td>Atopy, probably smoking</td>
<td>?</td>
</tr>
</tbody>
</table>
American College Of Chest Physicians Consensus Statement

Work-related asthma (WRA)

- Occupational asthma, caused by work (OA)
  - Sensitizer-induced OA
  - Irritant-induced OA (Including reactive airways dysfunction syndrome, RADS)

- Work-exacerbated asthma (WEA)

These groupings are not mutually exclusive; e.g. OA can be followed by WEA

Tarlo SM, Chest, 2008
Irritant induced asthma - Reactive Airway Dysfunction Syndrome (RADS)

- World War I / Iran-Iraq War (Chlorine and Mustard gas)

- Bhopal Industrial Disaster (Methyl-Isocyanate)
  - Acute pulmonary edema and death or chronic respiratory sequelae

RADS in firefighters and rescue personnel

- Substantial reduction in pulmonary function in NYCFD rescue workers during the first year after 9/11/2001

- The risk of development of bronchial hyperresponsiveness and cough was related to the intensity of exposure

Prezant DJ, NEJM, 2002 and Prezant DJ, AJRCCM, 2006
Occupations at risk

- Pulp mill / Paper mill workers (Chlorine gas)
- Industrial chlorine production
- Cleaners (various products such as bleach or degrasing sprays)
- Meat Wrapper’s Asthma (HCl, dicyclohexylphtalate)
- Potroom workers (particulate and gaseous fluorides, hydrofluoric acid, sulfur dioxide and cold tar volatiles)

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RADS criteria

- A documented **absence of previous respiratory complaints**.
- The **onset** of symptoms should occur **after a single specific exposure**.
- The **exposure** should be to a gas, smoke, fume, or vapor with **irritant qualities** that was present in very **high concentrations**.
- The **onset of symptoms** should occur **within 24 hours of exposure and should persist for at least three months**.
- The **symptoms** should simulate asthma with cough, wheezing, and dyspnea.
- Pulmonary function tests may or may not show airflow obstruction.
- **Methacholine challenge should be positive**.
- **Other types of pulmonary diseases should be ruled out**.

Brooks SM, Chest, 1985 adapted
American College Of Chest Physicians Consensus Statement

Work-related asthma (WRA)

- Occupational asthma, caused by work (OA)
- Work-exacerbated asthma (WEA)

Sensitizer-induced OA

Irritant-induced OA (Including reactive airways dysfunction syndrome, RADS)

These groupings are not mutually exclusive; e.g. OA can be followed by WEA

Tarlo SM, Chest, 2008
# Types of allergens

<table>
<thead>
<tr>
<th>HMW Agents</th>
<th>Selected Examples</th>
<th>LMW Agents</th>
<th>Selected Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant antigens</td>
<td>Cereals, flour; green coffee beans; tobacco; gums</td>
<td>Isocyanates</td>
<td>Polyurethane foam production and end-user applications (auto-spray painters)</td>
</tr>
<tr>
<td>Animal antigens</td>
<td>Rodents; cats and dogs; farm animals; mites</td>
<td>Wood dusts</td>
<td>Western red cedar (carpenters and sawmill workers)</td>
</tr>
<tr>
<td>Bioaerosols</td>
<td>Moulds and bacteria</td>
<td>Highly reactive compounds</td>
<td>Anhydrides, amines and acrylates</td>
</tr>
<tr>
<td>Enzymes</td>
<td>Detergent enzymes, amylase in baking</td>
<td>Aldehydes</td>
<td>Glutaraldehyde and formaldehyde</td>
</tr>
<tr>
<td>Latex</td>
<td>Gloves (health-care workers and others)</td>
<td>Colophony</td>
<td>Solder fluxes</td>
</tr>
<tr>
<td>Seafood</td>
<td>Crabs, prawns and fish</td>
<td>Dyes</td>
<td>Reactive dyes (textile workers)</td>
</tr>
<tr>
<td>Drugs</td>
<td>Antibiotics; psyllium laxatives</td>
<td>Persulfate</td>
<td>Hairdressers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Metals</td>
<td>Metal plating (chrome, nickel and cobalt), platinum (catalysts)</td>
</tr>
</tbody>
</table>

Tarlo SM et al. Chest 2008
Overview

- Definitions
- **Frequency**
- How to diagnose OA
- Consequences
- Prevention of OA
Frequency of occupational diseases

- Haut: 28%
- Atemwege: 22%
- Asbest: 17%
- Staublungen: 14%
- Lärm: 6%
- Infektionen: 7%
Costs of occupational diseases
Overview

- Definitions
- Frequency
- **How to diagnose OA**
- Consequences
- Prevention of OA
History

- Current job and exposure, past job and exposure
- Co-workers job and exposure
- Respiratory protection used
- Upper airway symptoms
- Symptoms increase while at work or within several hours of the completion of a shift
- Improvements on weekends or during vacations
Peak Flow (PEF) Measurement

- At least four times daily for four weeks (two weeks at work and two weeks off work)
- At least three readings on each occasion
- Record the maximum, continue until the readings are within 20L/min of each other
"In individuals with suspected WRA who are currently working at the job in question, record serial measurements of peak flow as part of the diagnostic evaluation and ask the patient to record these optimally a minimum of four times daily, for at least 2 weeks at work and 2 weeks off work."
PEF: Guidelines 2

- Health practitioners who suspect a worker of having occupational asthma should arrange for workers to perform serial peak flow measurements at least four times a day.

- Physicians should confirm a diagnosis of occupational asthma supported by objective criteria (functional, immunological, or both) and not on the basis of a compatible history alone because of the potential implications for future employment.
Peak Flow Chart
Peak Flow Chart
Peak Flow Measurement

1. Only 80% of the values were either recorded or stored.
2. Reported values corresponded precisely to stored values in 52%.
3. In 29% the difference in time of the reported and recorded values was unsatisfactory.
4. Compliance was significantly less satisfactory in those referred by the Workers’ Compensation Board ($n = 11$).
PEF-Logger

Alarm function (SMS)
Online chart
OASYS link
Specific Inhalation Challenge

Pepys J, Clin Allergy 1972
## Specific Inhalation Challenge

- **Workplace**

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Exposure</th>
<th>FEV1</th>
<th>Var.</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>17/2</td>
<td>800</td>
<td>no</td>
<td>4.12</td>
<td>-4%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>900</td>
<td>no</td>
<td>4.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1200</td>
<td>no</td>
<td>4.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1600</td>
<td>no</td>
<td>4.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18/2</td>
<td>800</td>
<td>no</td>
<td>4.10</td>
<td>-22%</td>
<td>Nasal itching</td>
</tr>
<tr>
<td></td>
<td>815</td>
<td>5 min</td>
<td>4.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>830</td>
<td>10min</td>
<td>3.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>900</td>
<td>20min</td>
<td>3.56</td>
<td></td>
<td>Cough</td>
</tr>
<tr>
<td></td>
<td>1000</td>
<td>45min</td>
<td>3.20</td>
<td></td>
<td>Cough</td>
</tr>
</tbody>
</table>
Overview

- Definitions
- Frequency
- How to diagnose OA
- **Consequences**
- Prevention of OA
Treatment

- Asthma treatment according to GINA guidelines -> aim for total asthma control

- Inhaled beclomethasone given shortly after diagnosis in addition to removal from exposure -> improvement in symptoms, lung function and quality of life

- Case reports using omalizumab in bakers‘ asthma and health care workers with latex allergy

Adverse outcomes of occupational asthma

Malo et al., Am Rev Respir Dis 1988
Prognosis

- Duration of symptoms after the onset of exposure is the main determinant for recovery or persistence of asthma.

- In 1/3 of cases, removal from exposure leads to improvement or cure.

- Continued exposure generally leads to worsening of asthma. Deaths have been reported.

## Long term outcome of OA

<table>
<thead>
<tr>
<th></th>
<th>Diagnosis</th>
<th>Follow up</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper airway symptoms</td>
<td>28 (80%)</td>
<td>9 (26%)</td>
<td>$&lt;0.001$</td>
</tr>
<tr>
<td>Asthma symptoms</td>
<td>34 (97%)</td>
<td>20 (57%)</td>
<td>$&lt;0.001$</td>
</tr>
<tr>
<td>Asthma medication*</td>
<td>31 (91%)</td>
<td>19 (56%)</td>
<td>0.002</td>
</tr>
<tr>
<td>SABA*</td>
<td>19 (56%)</td>
<td>13 (38%)</td>
<td>0.18</td>
</tr>
<tr>
<td>LABA*</td>
<td>10 (29%)</td>
<td>10 (29%)</td>
<td>1.0</td>
</tr>
<tr>
<td>ICS*</td>
<td>26 (76%)</td>
<td>10 (29%)</td>
<td>$&lt;0.001$</td>
</tr>
</tbody>
</table>

Ruegger M, Droste D, Hofmann M and Jost M
Manuscript in preparation
### Tabelle 2
Beurteilung des Impairments bei Berufsasthma.

<table>
<thead>
<tr>
<th>Punkte</th>
<th>Lungenfunktion</th>
<th>Bronchiale Hyperreagibilität</th>
<th>Behandlung</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FEV₁ (% des Soll-Werts)</td>
<td>PD 20 (µg Metacholin)</td>
<td>Reversibilität FEV₁ nach β2-Mimentikum (%)</td>
</tr>
<tr>
<td>0</td>
<td>Normbereich</td>
<td>&gt;8</td>
<td>&lt;10</td>
</tr>
<tr>
<td>1</td>
<td>70–79%</td>
<td>&gt;0,51–8</td>
<td>10–19</td>
</tr>
<tr>
<td>2</td>
<td>60–69%</td>
<td>0,125–0,5</td>
<td>20–29</td>
</tr>
<tr>
<td>3</td>
<td>50–59%</td>
<td>&lt;0,125</td>
<td>&gt;30</td>
</tr>
<tr>
<td>4</td>
<td>&lt;50%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Impairment gemäß American Thoracic Society:
1–3 Punkte entsprechen 25%; 4–6 Punkte entsprechen 33,3%; 7–9 Punkte entsprechen 50%; 10–11 Punkte entsprechen 66,6%.

Validierung durch Ergebnisse der Spiroergometrie (VO₂ peak): 15–25 ml/kg/min entsprechen 33,3–50% <15 ml/kg/min entsprechen 66,6–100%.

* Geringe Dosis inhalierte Steroide: <800 µg Beclomethason-Äquivalent
** Hohe Dosis inhalierte Steroide: 800–1000 µg Beclomethason-Äquivalent
*** Sehr hohe Dosis inhalierte Steroide: >1000 µg Beclomethason-Äquivalent
Äquivalenzdosen: 1 Dosis Beclomethason ≈ 1 Dosis Mometason ≈ 0,5 Dosis Fluticasone
# Socio-economic consequences of OA

<table>
<thead>
<tr>
<th>Country</th>
<th>Reference</th>
<th>No. of subjects</th>
<th>Follow-up (yr)</th>
<th>Work disruption (%)</th>
<th>Loss of income (% of workers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td><em>Gannon, 1993</em></td>
<td>112 Median: 1.4</td>
<td>35%</td>
<td>Exposed: 44%</td>
<td>Unexposed: 74%</td>
</tr>
<tr>
<td>Canada, BC</td>
<td><em>Marabini, 1993</em></td>
<td>128 Mean: 4.8</td>
<td>41%</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Canada, Qc</td>
<td><em>Dewitte, 1994</em></td>
<td>134 Range: 2-5</td>
<td>25%</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td><em>Cannon, 1995</em></td>
<td>87 5</td>
<td>39%</td>
<td>55%</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td><em>Ameille, 1997</em></td>
<td>209 Mean: 3.1</td>
<td>34%</td>
<td>46%</td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td><em>Gassert, 1998</em></td>
<td>55 Mean: 2.6</td>
<td>69%</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td><em>Ross, 1998</em></td>
<td>770 1.5-5.5</td>
<td>37%</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td><em>Larbanois, 2002</em></td>
<td>86 Median: 3.3</td>
<td>38%</td>
<td>62%</td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td><em>Leira, 2005</em></td>
<td>496 2-6</td>
<td>49%</td>
<td>51%</td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td><em>Piirila, 2005</em></td>
<td>213 Mean: 10</td>
<td>14%</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>Ruegger</td>
<td>35 12.1</td>
<td>37%</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

Costs

- Total costs: direct + indirect costs
- Direct costs: costs using healthcare resources to diagnose, treat and rehabilitate workers
- Indirect costs:
  - For the individual: lost of income, ‘human costs’
  - For the employer: costs from sickness absence, costs of labour turnover, insurance costs
Costs

- Total lifetime costs of all OA cases diagnosed in the UK in 2003: 105 – 150 million CHF
- Mean total lifetime costs of each individual case of OA diagnosed in the UK in 2003: 180’000 - 240’000 CHF
- Mean direct costs between 1988 and 2002 of each individual case of OA diagnosed in Québec: 89’000 CHF
  (not included: lifelong drugs, indirect costs)

Direct costs for OA in Switzerland

Abbildung 37: Leistungen der Suva in CHF (TK1, n=35)

Abbildung 38: Leistungen der IV in CHF (TK1, n=9)

Abbildung 41: Übersicht über die mittleren Versicherungsleistungen (TK1, n=9)

*Dissertation Doreen Droste, Universität Zürich, 2009*
Overview

- Definitions
- Frequency
- How to diagnose OA
- Consequences
- Prevention of OA
Level of exposure as risk factor for sensitization and occupational rhinitis

Detergent factory worker

<table>
<thead>
<tr>
<th>Job</th>
<th>Number with positive skin prick tests</th>
<th>Odds ratio (95% CI)</th>
<th>Number with work-related upper respiratory symptoms and positivity to at least one enzyme</th>
<th>Odds ratio (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amylase</td>
<td>Protease</td>
<td>Cellulase</td>
<td>At least one enzyme</td>
</tr>
<tr>
<td>Packing (refill line, n=22)</td>
<td>17 (77%)</td>
<td>17 (77%)</td>
<td>10 (45%)</td>
<td>17 (77%)</td>
</tr>
<tr>
<td>Production (n=131)</td>
<td>38 (29%)</td>
<td>30 (23%)</td>
<td>28 (21%)</td>
<td>43 (33%)</td>
</tr>
<tr>
<td>Packing (other, n=51)</td>
<td>11 (22%)</td>
<td>8 (16%)</td>
<td>7 (14%)</td>
<td>15 (29%)</td>
</tr>
<tr>
<td>Distribution (n=21)</td>
<td>4 (19%)</td>
<td>3 (14%)</td>
<td>1 (5%)</td>
<td>4 (19%)</td>
</tr>
<tr>
<td>Engineering (n=23)</td>
<td>6 (26%)</td>
<td>4 (17%)</td>
<td>3 (13%)</td>
<td>7 (30%)</td>
</tr>
<tr>
<td>Laboratory work (n=26)</td>
<td>2 (8%)</td>
<td>2 (8%)</td>
<td>2 (8%)</td>
<td>2 (8%)</td>
</tr>
<tr>
<td>Other (n=26)</td>
<td>1 (4%)</td>
<td>1 (4%)</td>
<td>0</td>
<td>1 (4%)</td>
</tr>
<tr>
<td>Office work* (n=42)</td>
<td>1 (2%)</td>
<td>1 (2%)</td>
<td>0</td>
<td>1 (2%)</td>
</tr>
<tr>
<td>Total (n=342)</td>
<td>80 (23%)</td>
<td>66 (19%)</td>
<td>61 (15%)</td>
<td>90 (26%)</td>
</tr>
</tbody>
</table>

*Reference category, †positivity for at least one enzyme adjusted for atopy.

suva pro Cullinan P, Lancet 2000
Primary prevention

- Primary prevention aims to protect against the development of disease and disability.
Substitution

Technik

Organisation

Person
Rights and obligations for the employer and employee

Bundesgesetz über die Unfallversicherung (UVG), Art. 82

- Der Arbeitgeber ist verpflichtet, zur Verhütung von Berufsunfällen und Berufskrankheiten alle Massnahmen zu treffen, die nach der Erfahrung notwendig, nach dem Stand der Technik anwendbar und den gegebenen Verhältnissen angemessen sind.

- Der Arbeitgeber hat die Arbeitnehmer bei der Verhütung von Berufsunfällen und Berufskrankheiten zur Mitwirkung heranzuziehen.


Loi fédérale sur l'assurance-accidents (LAA), Art. 82

- L’employeur est tenu de prendre, pour prévenir les accidents et maladies professionnels, toutes les mesures dont l’expérience a démontré la nécessité, que l’état de la technique permet d’appliquer et qui sont adaptées aux conditions données.

- L’employeur doit faire collaborer les travailleurs aux mesures de prévention des accidents et maladies professionnels.

- Les travailleurs sont tenus de seconder l’employeur dans l’application des prescriptions sur la prévention des accidents et maladies professionnels. Ils doivent en particulier utiliser les équipements individuels de protection et employer correctement les dispositifs de sécurité et s’abstenir de les enlever ou de les modifier sans autorisation de l’employeur.

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> Schutzöle
> Erst Hilfe
> Freizeit

Hohe Schutzwirkung, mit Ausatemventil (FFP3-Masken)

Hohe Schutzwirkung, mit Ausatemventil (FFP3-Masken)

1. bestellen / downloaden

Informationsmittel

Grenzwerte am Arbeitsplatz (PDF, 393 KB), MAK-Werte, BAT-Werte, Grenzwerte für physikalische Einwirkungen

Informationsmaterialien gegen Staubkeime (PDF, 148 KB), Dauer- und Nicht-Regeln der Verwendung

Gesundheitsgefährdende Stäube (PDF, 950 KB), Checkliste

www.suva.ch/asbest | Thema Asbest
Secondary prevention

- Secondary prevention aims to diagnose the disease in its earliest stages, before symptoms develop. At this stage the disease can be treated successfully, its progression slowed or complications limited.

- Medical surveillance programs: questionnaire, spirometry, immunologic tests (skin prick tests, specific IgE):
  - Decreased the incidence of new cases of OA (latex, laboratory animals, di-isocyanates…)
  - Decreased severity (less severe NSBHR)
  - Decreased costs

Tarlo, et al. JACI, 2001
Tarlo, et al. OEM, 2002
Fischer, et al. JOEM, 1998
Labrecque, et al. OEM, 2011
Arbeitsmedizinische Vorsorgeuntersuchungen

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irritants respiratoires

Vom Arbeitgeber auszufüllen und dem Arzt
zu übermitteln

Firmenbezeichnung
Raison sociale

A remplir par l’employeur et à remettre
au médecin examinateur

Suva-Betriebs-Nummer
N° Suva de l’entreprise

zw
Laar lassen/Lâchez en blanc

suva pro
Screening questionnaire

Questionnaire:

1) Have you had wheezing or whistling in your chest at any time in the last 12 months?
   - 2) Have you been at all breathless when the wheezing noise was present?
   - 3) Have you had this wheezing or whistling when you did not have a cold?

4) Have you woken up with a feeling of tightness in your chest or been woken by an attack of shortness of breath at any time in the last 12 months?

5) Have you been woken by an attack of coughing at any time in the last 12 months?

6) Have you had an attack of asthma in the last 12 months?

7) Are you currently taking medicine (including inhalers, aerosols or tablets) for asthma?

When you are at work, do you ever

- 8) Start to cough?
- 9) Start to wheeze?
- 10) Start to feel short of breath or get chest tightness?
   - 11) If “Yes” to one of the statements 8 to 10, do these problems related to your work lessen or disappear during the weekend or during holidays?

Pralong, et al. JOEM, 2013, in press
Tertiary prevention

- Tertiary prevention is aimed at limiting medical impairment in subjects with established disease by decreasing complications and disability, the progression of the disease and by providing help with rehabilitation.

Die Nichteignung kann nur dann verfügt werden, wenn der Arbeitnehmer bei der weiteren Ausübung seiner bisherigen Tätigkeit einer erheblichen Gefährdung ausgesetzt ist. Sie kann befristet oder dauernd sein. Die Verfügung muss auf die Beratungs- und Entschädigungsmöglichkeiten (Art. 82, 83 und 86) verweisen.

La CNA peut décider d’exclure d’un travail dangereux (inaptitude) un travailleur auquel s’appliquent les prescriptions sur la prévention dans le domaine de la médecine du travail, ou de l’autoriser exécuter ce travail certaines conditions (aptitude conditionnelle). L’employeur reçoit une copie de la décision. Si le travailleur est en mesure d’exécuter sans condition le travail considéré (aptitude), la CNA l’en informe ainsi que l’employeur.

L’inaptitude ne peut être prononcée que si le travailleur est sérieusement menacé par la poursuite de l’activité exercée jusqu’alors. Elle peut être temporaire ou permanente. La décision doit attirer l’attention du travailleur sur les possibilités qu’il a d’être conseillé et indemnisé (art. 82, 83 et 86).
Harm reduction or complete cessation of exposure???

- Search in Pubmed identified 114 publications
- 32 studies with outcome „reduced exposure“
- 10 studies included in meta-analysis
Reduction of exposure

- Less beneficial effect on asthma outcome than complete avoidance

- Limited quality of available studies do not allow definitive conclusions

- Not sufficient data to compare socio-economic consequences of these management options

Vandenplas et al., Eur Respir J 2011
American College Of Chest Physicians Consensus Statement

Work-related asthma (WRA)

- Occupational asthma, caused by work (OA)
- Work-exacerbated asthma (WEA)

- Sensitizer-induced OA
- Irritant-induced OA (Including reactive airways dysfunction syndrome, RADS)

These groupings are not mutually exclusive; e.g. OA can be followed by WEA

Tarlo SM, Chest, 2008
Work-exacerbated asthma (WEA)

- Pre-existing or concurrent asthma that is worsened by workplace conditions
- Prevalence of 22% in adults with asthma
- Triggers:
  - Irritant chemicals
  - Dusts
  - Second-hand smoke
  - Common allergens
  - Emotional stress
  - Worksite temperature
  - Physical exertion

Henneberger et al., Am J Respir Crit Care Med 2011
WEA vs. asthma unrelated to work

- More symptomatic days
- Greater utilization of health-care resources
- Lower quality of life

Henneberger et al., Am J Respir Crit Care Med 2011
WEA vs. OA

- Similar severity of asthma
- Similar medication requirements
- Same adverse socio-economic outcomes (unemployment, loss of income)

Henneberger et al., Am J Respir Crit Care Med 2011
Work Exacerbated Asthma

- Avoid triggering factors and increase asthma therapy
- Claim compensation