

Work-Exacerbated Asthma

The American Thoracic Society published a consensus statement in August, 2011 on work-exacerbated asthma. (**Am J Resp Crit Care Med 2011; 184:368-378**). A major conclusion of the consensus statement was that work - exacerbated asthma occurred in over 20% of adults with asthma.

Table I shows the criteria for defining work-exacerbated asthma that distinguishes it from asthma caused by work either from sensitization (occupational asthma) or after a large exposure to an irritant (Reactive Airways Dysfunction Syndrome).

There were seven major conclusions to the consensus statement:

- Work-exacerbated asthma (WEA) is defined as pre-existing or concurrent asthma that is worsened by workplace conditions.
- Epidemiological studies conducted in general populations indicate that WEA occurs in a substantial proportion of adults with asthma, with a median prevalence estimate of 21.5%.
- A wide variety of conditions at work can exacerbate asthma symptoms, including irritant chemicals, dusts, second-hand smoke, common allergens that may be present at work, as well as other "exposures" such as emotional stress, worksite temperature, and physical exertion.
- Patients with WEA who experience persistent work-related symptoms resemble occupational asthma (OA) cases with respect to severity of asthma and medication requirements, as well as socioeconomic factors like unemployment and loss of labor-derived income.
- Compared with asthma unrelated to work, WEA is associated with more symptomatic days, a greater utilization of health-care resources, and a lower quality of life.
- The possibility of WEA should be carefully addressed in any working patient with asthma by inquiring about the work-relatedness of his/her asthma symptoms.
- There is limited evidence pertaining to the natural history of WEA. Avoidance or reduction of exposure can often lead to an improvement in asthma symptoms.



Table I. Definition of Work-Exacerbated Asthma

Criterion 1 – Asthma onset before entering or during the workplace of interest but not caused by the workplace of interest.

Criterion 2 – Temporal association of asthma exacerbation with work as documented by symptoms, medication use or objective indications like serial peak flow measurements.

Criterion 3 – Conditions exist at work that can exacerbate asthma.

Criterion 4 – Asthma from a sensitizer at work is unlikely.

It should be noted that the estimate that 21.5% of adults with asthma have work-exacerbated asthma is in addition to the 15% of asthma in adults caused by work (**Am J Resp Crit Care Med 2003; 167:787-797**).

As always we are interested in receiving reports of all types of work-related asthma including work-exacerbated asthma. Dr. Rosenman is happy to assist if you have questions regarding diagnosis, management or workers' compensation issues, 1-800-446-7805.

Wind Turbines and Health

With initiatives for increasing the percentage of energy that is derived from renewable energy sources, more commercial wind turbines are being built. This has generated interest and some controversy about the potential safety and health concerns of these turbines. We recently co-authored and released a report entitled "Recommended Update of Sample Zoning for Wind Energy Systems". The report can be found at: <http://www.oem.msu.edu/windandhealth.aspx>. Because there are no state regulations on siting wind turbines, the regulation of siting (i.e. how close to homes, allowable levels of noise) is determined by local zoning boards.

The health issues related to placement are physical safety from structural collapse, blade failure or ice throw, shadow flicker and noise exposure. The noise issue has generated the most disagreement.

The minimum recommended setback from a residence for a wind turbine should be the height of the tower plus the height of the blade in its vertical position. We are aware that some guidelines recommendations are more protective and recommend 1.1-1.5 times the above distance.

Shadow flicker occurs when the rotating blades of a wind turbine are positioned directly between the light and the reference point. Shadow flicker varies by weather (sunny or overcast), time of day and season. Shadow flicker at any given location can be calculated and limitations for the number of allowable hours of shadow flicker can be specified.

Noise levels from wind turbines are below levels that cause hearing loss. The concern about noise is centered on annoyance, particularly sleep disturbance. In our new report, we recommend a 40dBA limit to noise at night to prevent sleep disturbance and the health effects associated with sleep disturbance. The noise level of a ringing telephone or whisper is 30dBA. Our recommendation is based on the World Health Organization (WHO) review of the literature.



A summary of health effects that is the basis of the 40dBA recommendation from the WHO report is shown in Table II. The full WHO report of Night Noise Guidelines for Europe can be found at: http://www.euro.who.int/__data/assets/pdf_file/0017/43316/E92845.pdf.

Table II . Summary of effects and threshold levels for effects where sufficient evidence is available			
Effect		Indicator	Threshold, dB
Biological effects	Change in cardiovascular activity	*	*
	EEG awakening	$L_{Amax, inside}$	35
	Motility, onset of motility	$L_{Amax, inside}$	32
	Changes in duration of various stages of sleep, in sleep structure and fragmentation of sleep	$L_{Amax, inside}$	35
Sleep quality	Waking up in the night and/or too early in the morning	$L_{Amax, inside}$	42
	Prolongation of the sleep inception period, difficulty getting to sleep	*	*
	Sleep fragmentation, reduced sleeping time	*	*
	Increased average motility when sleeping	$L_{night, outside}$	42
Well-being	Self-reported sleep disturbance	$L_{night, outside}$	42
	Use of somnifacient drugs and sedatives	$L_{night, outside}$	40
Medical conditions	Environmental insomnia**	$L_{night, outside}$	42

*Although the effect has been shown to occur or a plausible biological pathway could be constructed, indicators or threshold levels could not be determined.

**Note that “environmental insomnia” is the result of diagnosis by a medical professional whilst “self-reported sleep disturbance” is essentially the same, but reported in the context of a social survey. Number of questions and exact wording may differ.

L_{Amax} = maximum level per event.

$L_{night, outside}$ = yearly average of night noise outside home.



*Project
S E.N.S.O.R. News

Michigan State University
College of Human Medicine
117 West Fee Hall
East Lansing, MI 48824-1316
Phone (517) 353-1846

Address service requested.

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*PS Remember to report all cases of occupational disease!

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(517) 353-1846
MSU-CHM
117 West Fee Hall
East Lansing, MI 48824-1316

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College of Human Medicine—At Michigan State University—

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Management and Technical Services Division
P.O. Box 30649
Lansing, MI 48909-8149

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