directly caused the functional impact limitation or if the limitation causes disability only in certain demanding occupations.

Clinicians caring for patients with respiratory disease should spend a few moments assessing whether respiratory disability is present. If so, the specific nature of the disability should be evaluated and the patient-clinician dyad should explore whether interventions such as contacting the employer or modifying the asthma medications could reduce the extent of the disability.

Competing interests: None.

Thorax 2009;**64**:280–282. doi:10.1136/thx.2008.108811

REFERENCES

1. **Lopez AD,** Mathers CD, Ezzati M, *et al*. Global and regional burden of disease and risk factors, 2001: systematic analysis of population health data. *Lancet* 2006;**367**:1747–57.
2. **Torén K,** Zock J, Kogevinas M, *et al*. An international prospective general population-based study of respiratory work disability. *Thorax* 2009;**64**:339–44.
3. **Yacoub MR,** Lavoie K, Lacoste G, *et al*. Assessment of impairment/disability due to occupational asthma through a multidimensional approach. *Eur Respir J* 2007;**29**:889–96.
4. **Vandenplas O,** Toren K, Blanc PD. Health and socioeconomic impact of work-related asthma. *Eur Respir J* 2003;**22**:689–97.
5. **Tarlo SM,** Balmes J, Balkissoon R, *et al*. Diagnosis and management of work-related asthma: American College Of Chest Physicians Consensus Statement. *Chest* 2008;**134**:1–41S.
6. **Dimich-Ward H,** Taliadouros V, Teschke K, *et al*. Quality of life and employment status of workers with Western red cedar asthma. *J Occup Environ Med* 2007;**49**:1040–5.
7. **Harber P.** Respiratory disability. The uncoupling of oxygen consumption and disability. *Clin Chest Med* 1992;**13**:367–76.
8. **Henneberger PK,** Deprez RD, Asdigian N, *et al*. Workplace exacerbation of asthma symptoms: findings from a population-based study in Maine. *Arch Environ Health* 2003;**58**:781–8.
9. **Adams RJ,** Wilson D, Smith BJ, *et al*. Impact of coping and socioeconomic factors on quality of life in adults with asthma. *Respirology* 2004;**9**:87–95.
10. **Field MJ,** Jette AM. *A new look. The future of disability in America*. Institute of Medicine (US) Committee on Disability in America. Washington, DC: National Academies Press, 2007.
11. **Harber P,** Hsu P, Chen W. An "atomic" approach to dis/ability assessment. *J Occup Environ Med* 1996;**38**:359–66.

Lung alert

Vitamin D insufficiency is common and associated with complications in cystic fibrosis

Vitamin D insufficiency (VDI) contributes to low bone mineral density (BMD) in adults with cystic fibrosis (CF). Vitamin D may improve skeletal/respiratory muscle function and upregulate antimicrobial peptides, improving immunity. This 2-year retrospective study reviewed medical records of 185 adults of mean (SD) age 29 (9) years with CF. Parameters of bone health and the relationship between vitamin D status and forced expiratory volume in 1 s (FEV_1) were investigated.

The subjects (93% white, 17% black) had a mean body mass index (BMI) of 21.2 kg/m^2; 70% used multivitamins and 47.6% took vitamin D. VDI was found in 76% of patients (25-hydroxyvitaminD (25(OH)D) <75 nmol/l) and vitamin D deficiency in 23% (25(OH)D <37.5 nmol/l). VDI was associated with race (black>white), lack of vitamin D use and season. The vitamin D status was positively associated with lowest FEV_1, independent of age, gender, BMI and race. BMD was low (lumbar spine T-scores of <-1.0 and <-2.5 in 52% and 10% subjects, respectively), non-significantly associated with vitamin D status. Over 2 years, 27% of subjects had ≥ 1 vertebral fracture associated with lower FEV_1 ($p<0.001$) but not age, BMI, vitamin D or multivitamin supplementation. Multivitamins did not prevent VDI.

Patients with CF with more severe disease (greater fat malabsorption) and lower FEV_1 may have decreased physical activity and sun exposure, all contributing to VDI. Low BMD is associated with vertebral fractures and kyphosis, reducing FEV_1 further. This cross-sectional study could not demonstrate causality between vitamin D status and fractures or FEV_1, but highlights the extent of VDI and skeletal morbidity in adults with CF, calling for improved screening for vitamin D status.

► Wolfenden LL, Judd SE, Shah R, *et al*. Vitamin D and bone health in adults with cystic fibrosis. *Clin Endocrinol* 2008;**69**:374–81.

J E Ostberg

Correspondence to: Dr J E Ostberg, Consultant in Endocrinology and Diabetes, Watford General Hospital, Watford, UK; Julia.Ostberg@whht.nhs.uk