Table 2 Summary of results and compliance to recommendations (results in percentages).

	European	National	UK	American
Screen tools	50	50	60	50
Screen time	75	75	90	75
TST ''cut-off''	90	80	80	80
Diagnosis methods of LTBI	70	70	0	70
LTBI treatment	80	80	20	80
Timing of initiation of anti-TNF if LTBI	80	80	0	80
TB re-testing	10	10	0	10

of the physicians concerned, we found that among the protocols followed by experienced anti-TNF prescribers, the rate of compliance with the guidelines is low and there is excessive confidence in the TST. Re-testing is neglected and is a something that needs to be improved. The availability of facilities in Portugal such as the TB outpatient clinic can be considered a real asset but they are not used to their full potential.

Conflicts of interest

The authors have no conflicts of interest to declare.

References

1. Solovic I, Sester M, Gomez-Reino JJ, Rieder HL, Ehlers S, Milburn HJ, et al. The risk of tuberculosis related to tumour necrosis factor antagonist therapies: aTBNET consensus statement. Eur Respir J. 2010;36:1185–206.
2. Askling J, Fored CM, Brandt L, Baecklund E, Bertilsson L, Coster L, et al. Risk and case characteristics of tuberculosis in rheumatoid arthritis associated with tumor necrosis factor antagonists in Sweden. Arthritis Rheum. 2005;52:1986–92.
3. Gomez-Reino JJ, Carmona L, Valverde VR, Mola EM, Montero MD. Treatment of rheumatoid arthritis with tumor necrosis factor inhibitors may predispose to significant increase in tuberculosis risk: a multicenter active-surveillance report. Arthritis Rheum. 2003;48:2122–7.
4. Wallis RS. Tumour necrosis factor antagonists: structure, function, and tuberculosis risks. Lancet Infect Dis. 2008;8:601–11.
5. Duarte R, Campainha S, Cotter J, Rosa B, Varela P, Correia A, et al. Position paper on tuberculosis screening in patients with immune mediated inflammatory diseases candidates for biological therapy. Acta Reumatol Port. 2012;37:253–9.
6. Thoracic Society (BTS) recommendations for assessing risk and managing tuberculosis in patients due to start anti-TNF-alpha treatments. Thorax, vol. 60. Joint Tuberculosis Committee of the British Thoracic Society; 2005. p. 800–5.
7. Singh JA, Furst DE, Bharat A, Curtis JR, Kavanaugh AF, Kremer JM, et al. Update of the 2008 American College of Rheumatology recommendations for the use of disease-modifying antirheumatic drugs and biologic agents in the treatment of rheumatoid arthritis. Arthritis Care Res. 2012;64:625–39.
8. Smith MY, Attig B, McBamee L, Eagle T. Tuberculosis screening in prescribers of anti-tumor necrosis factor therapy in the European Union. Int J Tuberc Lung Dis. 2012;16(9):1168–73.

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Oxygen therapy: a clinical audit in an Internal Medicine Department

Dear Editor,

Oxygen therapy, from prescription to administration, is still poorly handled,[1–6] and until the publication of ''Guideline for emergency oxygen use in adult patients'' by the British Thoracic Society[1] there were very little literature about oxygen therapy procedures.[1,7]

Recognizing the need to improve oxygen therapy procedures, the authors conducted an audit in 2008 to identify faulty practice and plan improvement measures. Three years later, a second audit was performed in order to evaluate those measures.

A taskforce consisting of physicians and nurses was set up in 2007 to evaluate OT practice in Internal Medicine wards of Hospital de Santo António, Oporto, Portugal. Based on the BTS guidelines, and according to NICE principles for best practice in clinical audit,[3] an audit was designed to evaluate the different aspects of OT: prescription, transcription, administration and monitoring.

The audit was performed in two of the four wards of the department between January 1st and March 31st 2008. All patients to whom oxygen was administered or prescribed were included in the audit, except those with non-invasive ventilation during daytime. Assessments were performed two days per week. No assessments were performed at

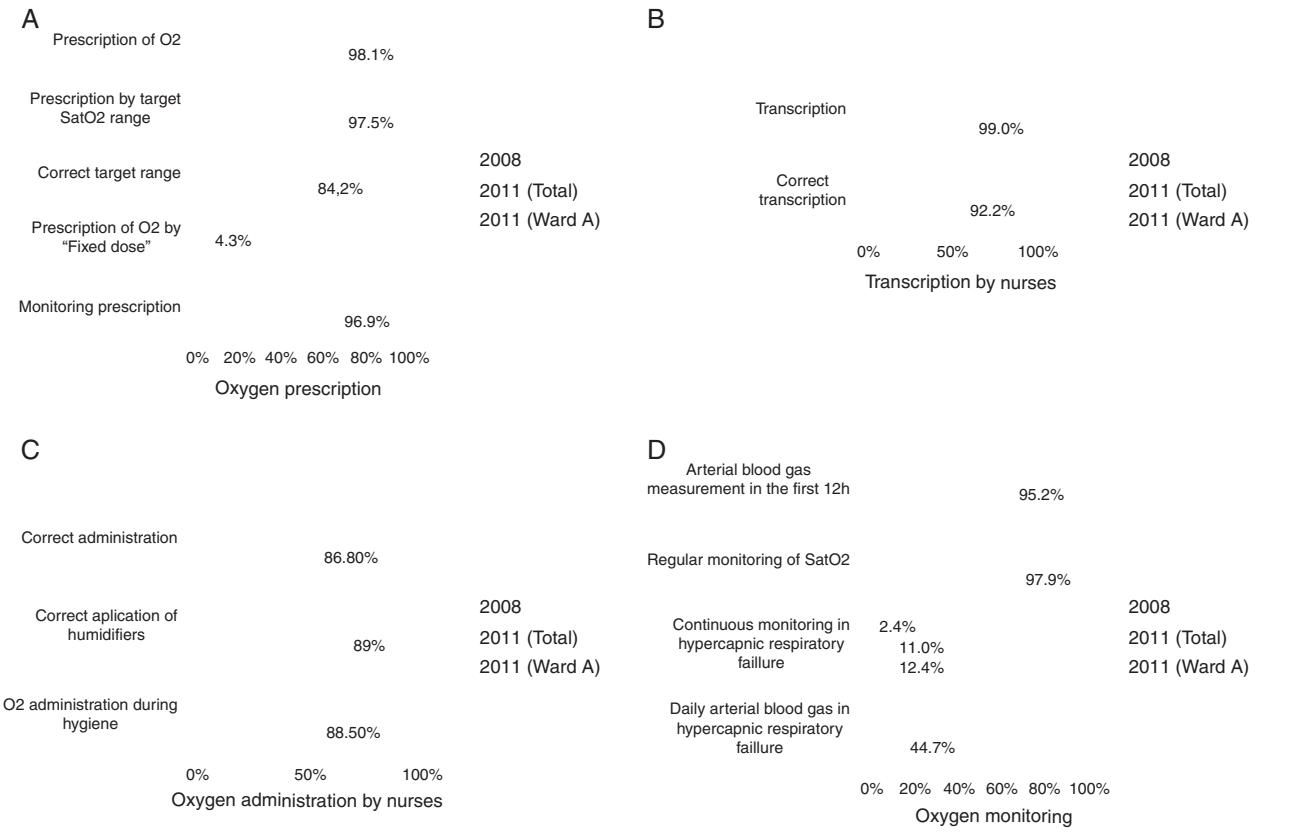

Figure 1 Comparison of results between the 2008 and the 2011 audits. (A) Oxygen prescription; (B) transcription by nurses; (C) oxygen administration by nurses (D) oxygen monitoring.

weekends, on Mondays, public holidays or the day after holidays, nor of patients admitted to the ward in the previous 24 h, to ensure all prescriptions were performed/validated by ward physicians.

Information of the audit was obtained from clinical records, nurses' software application or direct patient observation. Statistical analysis was performed using IBM SPSS v11.0.

Results of the first audit are published elsewhere.[5] The main findings are summarized here and presented in Fig. 1A–D, in comparison with those of the second audit.

The authors considered that good practice was met whenever the rate of compliance was $\geq$90%. Based on this threshold, several criteria were identified as needing improvement. In relation to *prescription*, lack of a specific period of oxygen therapy institution and monitoring were the main problems. Prescription to target $SatO_2$ range was observed in <50% of the patients. *Transcription* by nurses was incorrect in 26.8% of the patients. A significant number of patients on oxygen therapy had been correctly *administered* oxygen, but not during hygiene. In patients with acute hypercapnic respiratory failure, *monitoring* of oxygen administration was far from appropriate.

Several improvement measures were implemented: educational material was given to health professionals and patients; BTS guidelines were made accessible on all computers; training sessions were held in all wards of the department; an alert for hypercapnic respiratory failure was created on the prescription system; patients at risk of hypercapnic respiratory failure or in need of humidifiers were identified with bedside signs.

A re-audit was performed in all four wards between February 1st and April 31st 2011, using a similar methodology. Results were compared to those of the first audit; a separate comparison was also made between results in the wards audited in 2008 (A and D) and the corresponding ward in 2011 (Ward A – fusion of A and D).

This audit's results were better than those of other studies,[2] including one multicentric study on OT performed in 24 Portuguese hospitals,[8] where only prescription and administration were evaluated.

A significant increase of oxygen prescription to target $SatO_2$ range was achieved (Fig. 1A). Prescription by ''fixed dose'' OT was residual in 2011. A correct target range was observed in <90%, an acceptable value since some patients may benefit from specifically tailored ranges.[1]

There was a substantial improvement in the prescription of OT monitoring. There was also a clear improvement in the quality and accuracy of transcription (Fig. 1B). Use of humidifiers cannot be compared to 2008 given no clear guidelines, regarding their use had existed at the time. Very good results were observed in 2011, with scarce (17.5%) but appropriate use (Fig. 1C), in keeping with BTS guidelines.

There was no improvement in oxygen administration during hygiene (Fig. 1C). An improvement in arterial blood gas measurement before or in the first 12 h of OT was achieved (Fig. 1D). In patients with acute hypercapnic

respiratory failure, monitoring is still far from appropriate (Fig. 1D).

This study confirms the value of clinical audits in improving quality of care. A combined strategy of education, protocol implementation, universal use of target $SatO_2$ range[1] and software applications with safety alarms can improve OT in a hospital setting.

Conflicts of interest

The authors have no conflicts of interest to declare.

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References

1. O'Driscoll BR, Howard LS, Davison AG. Guideline for emergency oxygen use in adult patients. Thorax. 2008;63 Suppl. VI:vi1–68.
2. Bateman NT, Leach RM. ABC of oxygen: acute oxygen therapy. BMJ. 1998;317:769–801.
3. National Institute for Health and Care Excellence. Principles for best practice in clinical audit. Oxford: Radcliffe Medical; 2002.
4. Kallstrom TJ, American Association for Respiratory Care (AARC). AARC clinical pratice guideline: oxygen therapy for adults in the acute care facility – 2002 revision & update. Respir Care. 2002;47:717–20.
5. Neves J, Sousa C, Marques I, Barbosa M, Pereira P, Ramos S, et al. Auditoria de oxigenoterapia em duas enfermarias de medicina. Rev Med Int. 2011;18:129–36.
6. Cooper N. Acute care: treatment with oxygen. Stud BMJ. 2004;12:56–8.
7. Thomson AJ, Webb DJ, Maxwell S, Grant IS. Oxygen therapy in adult medical care. BMJ. 2002;32:1406–7.
8. Neves JT, Lobão MJ, EMO Working Group. Oxygen therapy multicentric study – a nationwide audit to oxygen therapy procedures in internal medicine wards. Rev Port Pneumol. 2012;18(2):80–5.

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Solitary fibrous tumors of the pleura: not always a benign entity

Dear Editor,

Solitary fibrous tumor of the pleura (SFTP) is a rare tumor originating in mesenchymal cells; it represents less than 5% of all pleural tumors.[1] It is generally benign but 10–30% of SFTP are malignant.[2]

We report the case of a 61 year-old man, with a past history of bronchiectasis and severe restrictive ventilatory defect due to thoracic scoliosis (Fig. 1 A), who came to the pulmonology outpatients department with complaints of asthenia over the last year. He was an occasional pipe smoker and the physical examination showed marked thoracic deformity which limited chest expansion. A chest X-ray showed a large retrosternal opacity (Fig. 1B) and the chest computed tomography (CT) confirmed the presence of a retrosternal lobulated mass, 10.2 cm × 3.7 cm, in the right hemithorax (Fig. 1C and D). A percutaneous CT-guided biopsy was carried out and the histology showed evidence of mesenchymal neoplasm without necrosis, significant pleomorphism or mitotic figures. The tumor cell population stained diffusely for CD 34, vimentin, *bcl-2* and CD 99 and negative for S-100. Ki-67 was <5%. Although a benign SFTP was diagnosed based on the histology, a right thoracotomy was performed for diagnosis and treatment. A pedunculated tumoural mass was complete resected with segmental resection of the right upper lobe. Immunohistochemistry showed positivity for CD-34 and *bcl-2* confirming SFTP. The pathological examination revealed multiple mitotic figures (12 mitoses per 10 high-power fields), mild pleomorphism, hypercellularity, focal hemorrhage and several areas of necrosis and the resection margins were tumor-free. According to these features the tumor was classified as malignant. The post-operative period was uneventful and the patient was discharged home. The patient is now in the third month after surgery without any sign of local recurrence or metastization.

SFTP is a rare tumor with generally an indolent course and good prognosis with a 10-year survival rate up to 98%.[3] It occurs mainly in individuals in their sixth or seventh decades of life without gender bias. There is no association with tobacco, asbestos or other exposures. More than 50% of the patients are asymptomatic[4] and the tumor is frequently an incidental finding on a routine chest X-ray. When symptomatic, the patients usually present non-specific respiratory symptoms such as dyspnea, cough and chest pain, and more rarely systemic symptoms. Occasionally, SFTP can manifest as paraneoplastic syndromes, such as hypertrophic pulmonary osteoarthropathy (Pierre Marie-Bamberger syndrome) and refractory hypoglycemia (Doege-Potter syndrome). The frequency of these syndromes increases with tumor size.

Malignant SFTP is uncommon and its incidence varies from 7% to 60%. It rarely arises from a pre-existing SFTP undergoing malignant transformation. The role of percutaneous CT-guided biopsy is not yet established because its