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**Title:** How long do patients with pulmonary tuberculosis remain smear and culture positive?

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**Body:** Background Current international guidelines recommend patients with smear positive pulmonary tuberculosis (TB) have respiratory isolation for 2 weeks after starting treatment. Identifying patients who are more likely to need prolonged periods of respiratory isolation can be used to reduce infection risk, plan service provision and counsel patients. Aims To assess what proportion of patients remain smear and culture positive more than 2 weeks after starting TB treatment, and to identify factors associated with increasing time to sputum smear conversion. Method A retrospective cohort study of all adult inpatients treated for TB at a London teaching hospital with first AFB positive sputum smear between 01/01/2006 and 31/12/2011. Patients with multi drug resistant tuberculosis or only one sputum were excluded. Results We identified 69 patients, mean age 30 years, 71% were male, 10% HIV positive. 63% had cavitary disease, 51% had a high bacillary load on initial smear. Mean time (+/- SE) patients remained smear and culture positive was 23 +/- 4.47 days. 35 (51%) of patients were smear and culture positive at 14 days. Factors which were significantly (Mann-Whitney U Test for non-continuous variables, Spearman Rank Correlation for continuous variables;  $p < 0.05$ ) associated with prolonged culturable sputum smear positivity were increased bacillary load, male gender, being a current or ex-smoker and increased C-reactive protein (CRP) levels at presentation. Conclusions Half of patients remain smear and culture positive 14 days after starting TB treatment. Patients with a high bacterial load, smoking and male sex may need respiratory isolation for longer than 2 weeks.