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**Title:** Computer aided lung sound analysis in smokers

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**Body:** Computer technology was used to record and analyse lung sounds in two groups of healthy young subjects (smokers and non-smokers). Introduction Tobacco smoking is known to have adverse effects on human health. It is believed that smoking in early life has a substantial role in the development of chronic lung disease, but it is not yet known when the first measurable effects of smoking can be detected. Computer aided lung sound analysis (CALSA) permits the quantification of lung sounds, which may change in response to smoking related pathological processes. Crackles are one type of added lung sound which can be quantified using CALSA. Method Sixty male subjects (30 smokers and 30 non-smokers) aged  $26.6 \pm 4.7$  years were recruited from a student population. Lung sound recordings were made using a digital stethoscope, following published guidelines. Sounds were recorded on a computer with Matlab software. Using signal processing techniques, one characteristic of the crackles was measured (namely the two cycle deflection (2CD)) at each anatomical recording site. Statistical analysis was used to quantify differences in crackles between smokers and non-smokers. Findings Sixty sets of data have been analysed. The 2CD per site data revealed some statistically significant differences at both anterior sites (anterior left:  $F(2, 57) = 9.40, P = 0.00$ ; anterior right:  $F(2, 57) = 9.51, P = 0.00$ ) and both lateral sites (middle left:  $F(2, 57) = 4.2, P = 0.02$ ; middle right:  $F(2, 57) = 4.36, P = 0.02$ ). Conclusion The hypothesis that lung crackle's 2CD differ between asymptomatic smokers and non-smokers has been supported.