Noninvasive Pulse CO-Oximetry as a Tool to Detect Smoking Status in an Outpatient Setting.
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Purpose
There are several methods available to detect smoking status. We evaluated the use of a noninvasive Pulse CO-Oximeter that measures carboxyhemoglobin and methhemoglobin as a tool to detect smoking status in a outpatient setting.

Methods
We measured at each outpatient visit carboxyhemoglobin and methhemoglobin using a Rad-57 Pulse CO-Oximeter. We asked patients questions regarding their smoking status. The data was analyzed by using standard t-test and we calculated sensitivity, specificity, positive predictive value, and negative predictive value along with pre and post test probabilities.

Results
Of the 476 patient visits 98 were smokers, 72 second hand smokers, and 306 nonsmokers. At a cutoff for carboxyhemoglobin at 6% and higher the sensitivity was 46% with a specificity of 95% to detect a smoker. The positive predictive value was 76% with a negative predictive value of 85%. For methhemoglobin at a cutoff of .7% and higher the sensitivity was 45% with a specificity of 92%. The positive predictive value was 65% with a negative predictive value of 84% for a smoker. The carboxyhemoglobin levels for smokers was 5.9+/-4.45% while the carboxyhemoglobin levels for non smokers was 1.95+/-1.55%. This difference was significant(P=3.60928E-14). The methhemoglobin levels for smokers was .66+/-.31% while the methhemoglobin levels for non smokers was .38+/- .19%. This difference was significant(P=3.34689E-14).The carboxyhemogloblin levels for second hand smokers was 2.79+/-2.89% while the carboxyhemoglobin levels for nonsmokers was 1.94+/-1.55%. This difference was significant(P=0.001913). The methhemoglobin levels for second hand smokers was 0.49+/-0.25% while the methhemoglobin levels for non smokers was 0.38+/-0.19%. This difference was significant(P=0.000653).

Conclusion
In an outpatient clinic setting pulse co-oximetry can be used as a cheap quick and noninvasive method to detect smoking status. Detecting smoking status is key to effectively counseling patients regarding smoking cessation. Pulse CO-Oximetry can be effectively used in this situation. In addition its use may be extrapolated to other public health settings such as adolescent smoking cessation programs within school systems to help prevent smoking in vulnerable populations.