

Lung Nodule Prediction Tool for use in Areas Endemic to Coccidioidomycosis

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BACKGROUND

Currently validated lung nodule risk calculators inappropriately classify 84-94% of cocci nodules as intermediate-high risk for lung cancer. Additional workup results in unnecessary costs and risks.

METHODS

1. Collected candidate predictors from patients in our lung nodule program with cocci or stage I-IIIB lung cancer (01/2011-10/2022).
2. Developed and validated prediction model and assessed performance via ROC curve analysis.

RESULTS

- 80% sensitivity and 90% specificity for cocci when patients in the validation set met ≥ 6 cocci criteria.

DISCUSSION

If further validated, our tool can reduce the costs and consequences associated with expensive and invasive studies to diagnose cocci nodules.

ACKNOWLEDGEMENTS

- UCSF Fresno Lung Nodule Program
- UC Merced Biostatistics and Data Support Center

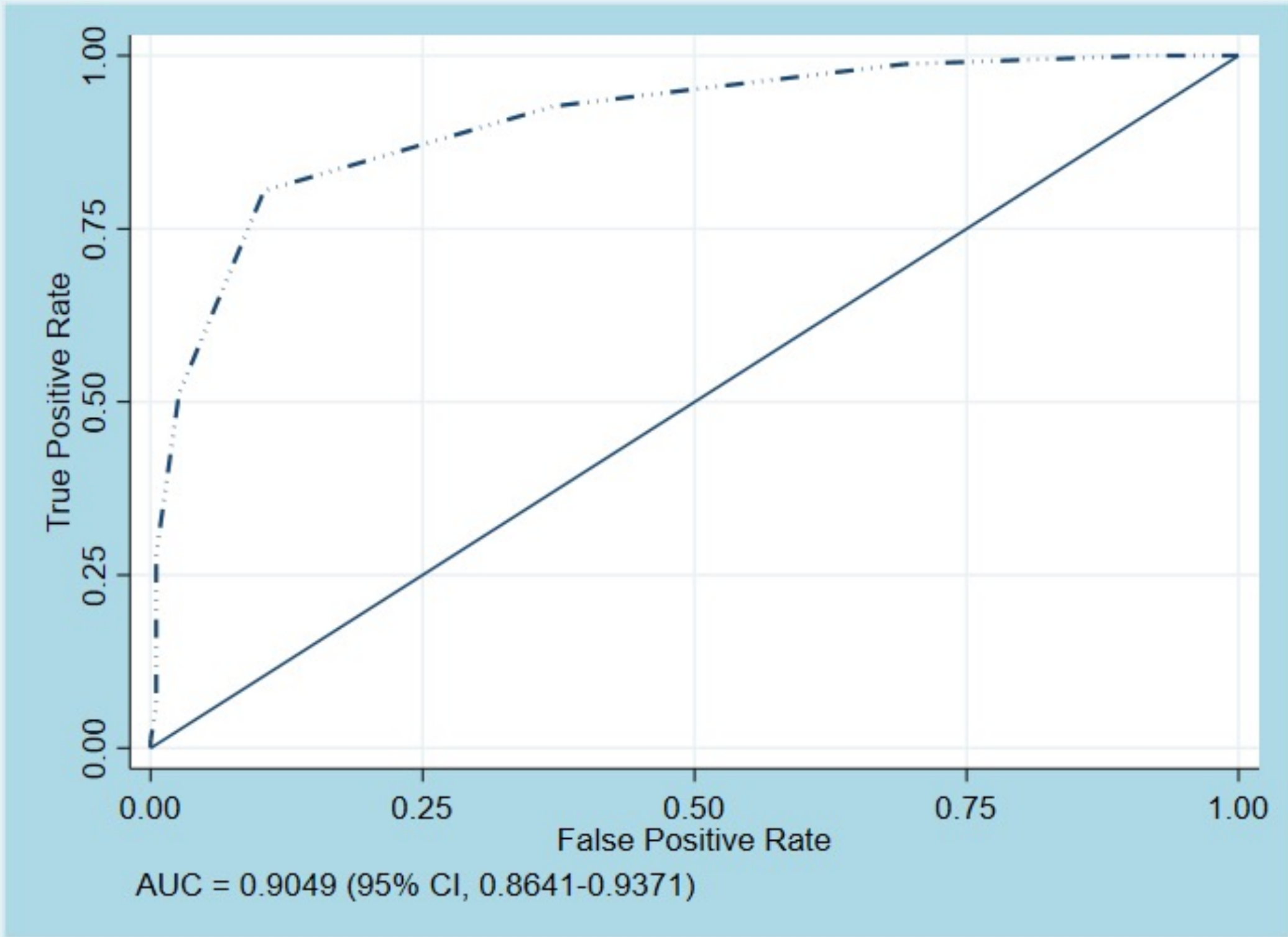
This is the first validated prediction tool developed to distinguish lung nodules due to coccidioidomycosis from those due to lung cancer.

Multivariable Model – Training data set (N=532)

Predictor	OR of Cocci	95% CI	p-value
Age < 60	4.127	[2.125, 8.012]	0.000
Male sex	5.248	[2.576, 10.689]	0.000
Pack years			
0	58.256	[12.026, 282.191]	0.000
1-19	9.135	[1.851, 45.081]	0.007
20-49	5.570	[1.240, 25.017]	0.025
50-79 (ref.)	1	NA	NA
>80	3.645	[.418, 31.780]	0.242
No exposure to asbestos	3.519	[1.290, 9.599]	0.014
Nodule density			
Solid	29.791	[2.263, 392.254]	0.010
Mixed*	1	NA	NA
Ground glass (ref.)	1	NA	NA
Other (e.g., necrotic, cystic, heterogenous)	50.966	[1.657, 1567.755]	0.025
Nodule location			
Right upper lobe	1.462	[.589, 3.629]	0.413
Right middle lobe	3.961	[1.019, 15.396]	0.047
Right lower lobe (ref.)	1	NA	NA
Left upper lobe	3.147	[1.177, 8.413]	0.022
Left lower lobe	2.193	[.806, 5.964]	0.124
Border characteristics			
Smooth/well-circumscribed	31.484	[4.930, 201.060]	0.000
Lobulated	2.000	[.598, 6.697]	0.261
Spiculated (ref.)	1	NA	NA
Other border irregularity (e.g., irregular, ill-defined, indistinct)	2.206	[.641, 7.594]	0.210
None of the above	6.552	[2.572, 16.689]	0.000
Cavitation	5.466	[2.110, 14.161]	0.000
Satellite nodules	23.998	[6.128, 93.981]	0.000
No radiographic evidence of chronic lung disease	3.427	[1.343, 8.744]	0.010

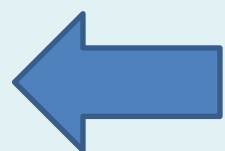
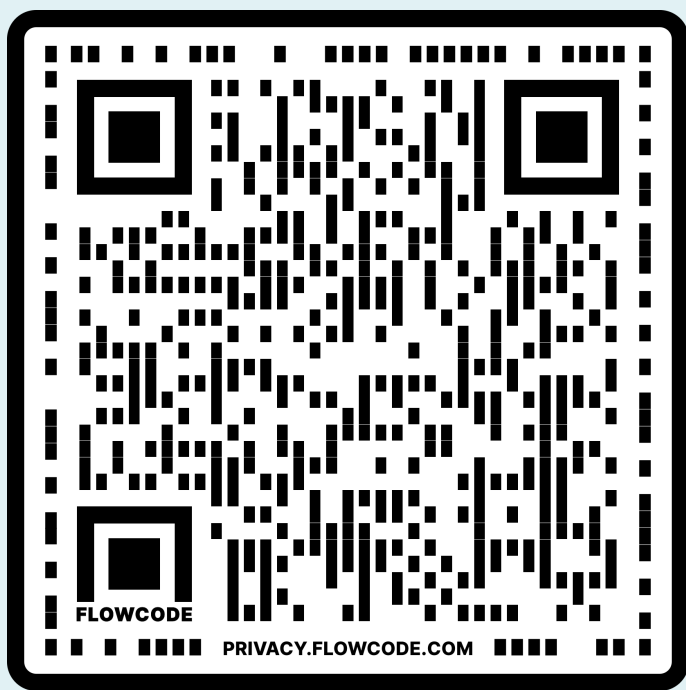
*OR not estimated due to too few cases

ROC Curve – Validation data set (N=274)



Cocci Criteria for Lung Nodules (each worth 1 point)

Age < 60
Male sex
< 50 pack years
No exposure to asbestos
No ground glass component(s)
Right middle or left upper lobe
No spiculated, lobulated, or irregular borders
Cavitation
Satellite nodules
No radiographic evidence of chronic lung disease



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