CHEST Online Supplement

Physician Assessment of Pretest Probability of Malignancy and Adherence With Guidelines for Pulmonary Nodule Evaluation

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e-Appendix 1: Prediction model equations

Model Equations

Probability of a malignant nodule = $e^x/(1 + e^x)$

Where for the VA Model

$x = -8.404 + (0.779*age/10) + (2.061*smoking status) + (0.112*nodule diameter) - (0.567*yearsquit/10)$

age/10 = age in years divided by 10;

smoking status = 1 if patient is current or former smoker, otherwise 0;

nodule diameter = largest nodule diameter in mm;

spiculation = 1 if the nodule was spiculated, 0 otherwise;

yearsquit/10 = number of years since quitting smoking divided by 10, 0 if not applicable

Where for the Mayo Model

$x = -6.8272 + (0.0391*age) + (0.7917*smoking status) + (1.3388*cancer) + (0.1274*nodule diameter) + (1.0407*spiculation) + (0.7838*lobe location)$

and

age = age in years;

smoking status = 1 if patient is current or former smoker, otherwise 0;

cancer history = 1 if the patient has a history of extrathoracic cancer 5 years or more before nodule detection, 0 if no or not specified;
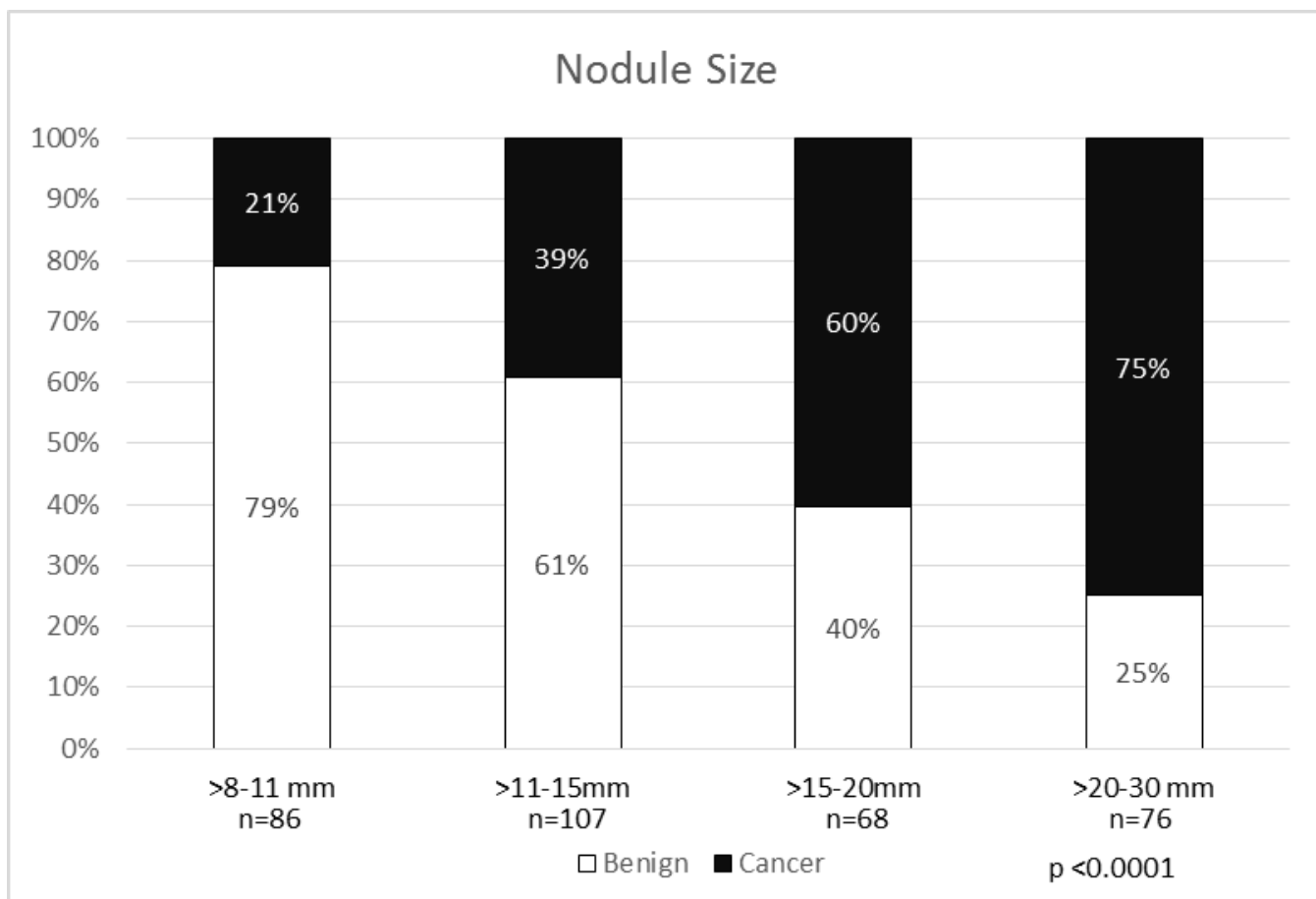
    Patients with a more recent history of cancer or a history of lung cancer were excluded from a Mayo analysis;

nodule diameter = largest nodule diameter in mm;

spiculation = 1 if the nodule was spiculated, 0 otherwise;

lobe location = 1 if the nodule was located in an upper lobe, 0 otherwise.

Nodule Size

e-Figure 1: Diagnostic outcome by nodule size

e-Table 1: Physician assessment and model agreement overall and stratified by diagnosis

Physician/VA		Overall		Cancer		Benign	
		n	%	n	%	n	%
00-05%	Agree	2	8	0	0	2	9
	Disagree	23	92	3	100	20	91
05-60%	Agree	139	80	29	71	110	83
	Disagree	35	20	12	29	23	17
60-100%	Agree	76	55	68	60	8	33
	Disagree	62	45	46	40	16	67
Physician/Mayo*		Overall		Cancer		Benign	
		n	%	n	%	n	%
00-05%	Agree	2	8	0	0	2	10
	Disagree	22	92	3	100	19	90
05-60%	Agree	152	89	35	85	117	91
	Disagree	18	11	6	15	12	9
60-100%	Agree	57	44	52	49	5	22
	Disagree	73	56	55	51	18	78

*Mayo model applied as described in original paper and subsequent publications patients with cancer history < 5 years prior were removed from analysis. (N=324)

e-Table 2: VA Model risk assessment and guideline concordance

VA Model Pre-Test Probability ≤ 5%			
	All n=5 (%)	Cancer n=0 (%)	Benign n=5 (%)
Guideline concordant CT surveillance	3 (60.0)	N/A	3 (60.0)
More Aggressive	2 (40.0)	N/A	2 (40.0)
PET	2 (40.0)	N/A	2 (40.0)
PET ≤30d before Surgery	0 (0.0)	N/A	0 (0.0)
Biopsy	0 (0.0)	N/A	0 (0.0)
VA Model Pre-Test Probability> 5% & ≤ 60%			
	All n=221 (%)	Cancer n=76 (%)	Benign n=145 (%)
Guideline concordant PET or Biopsy	111 (50.2)	49 (64.5)	62 (42.8)
More Aggressive	27 (12.2)	19 (25.0)	8 (5.5)
PET ≤30d before Surgery	23 (10.4)	18 (23.7)	5 (3.4)
Surgery	4 (1.8)	1 (1.3)	3 (2.1)
More Conservative			
CT	83 (37.6)	8 (10.5)	75 (51.7)
VA Model Pre-Test Probability ≥ 60%			
	All n=111 (%)	Cancer n=82 (%)	Benign n=29 (%)
Guideline concordant Surgery*	24 (21.6)	23 (28.0)	1 (3.4)
More Conservative	87 (78.4)	59 (72.0)	28 (96.6)
CT	10 (9.0)	4 (4.9)	6 (20.7)
PET*	64 (57.7)	45 (54.9)	19 (65.5)
Biopsy	13 (11.7)	10 (12.2)	3 (10.3)

PET performed within 30 days of surgery was considered a staging PET scan and concordant with guidelines

e-Table 3: Mayo Model risk assessment and guideline concordance

Mayo Model Pre-Test Probability ≤ 5%	All n=4 (%)	Cancer n=0 (%)	Benign n=4 (%)
Guideline concordant CT surveillance	2 (50.0)	N/A	2 (50.0)
More Aggressive	2 (50.0)	N/A	2 (50.0)
Pet	1 (25.0)	N/A	1 (25.0)
PET ≤30d before Surgery	0 (0.0)	N/A	0 (0.0)
Biopsy	1 (25.0)	N/A	1 (25.0)

Mayo Model Pre-Test Probability> 5% & ≤ 60%	All n=246 (%)	Cancer n=93 (%)	Benign n=153 (%)
Guideline concordant PET or Biopsy	131 (53.3)	60 (64.5)	71 (46.4)
More Aggressive	30 (12.2)	23 (24.7)	7 (4.6)
PET ≤30d before Surgery	25 (10.2)	20 (21.5)	5 (3.3)
Surgery	5 (2.0)	3 (3.2)	2 (1.3)
More Conservative			
CT	85 (34.6)	10 (10.8)	75 (49.0)

Mayo Model Pre-Test Probability ≥ 60%	All n=74 (%)	Cancer n=58 (%)	Benign n=16 (%)
Guideline concordant Surgery*	18 (24.3)	17 (29.3)	1 (6.3)
More Conservative	56 (75.7)	41 (70.7)	15 (93.8)
CT	4 (5.4)	2 (3.4)	2 (12.5)
PET*	45 (60.8)	34 (58.6)	11 (68.8)
Biopsy	7 (9.5)	5 (8.6)	2 (12.5)

*PET performed within 30 days of surgery was considered a staging PET scan and concordant with guideline

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