Online Data Supplement

Chest Computed Tomographic Image Screening for Cystic Lung Diseases in Patients with Spontaneous Pneumothorax is Cost-effective

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Table E1: Values of data used in our model for BHD

Parameters	**Base case value**	**Values used in sensitivity analysis**	**Reference**
Prevalence of BHD in patients with spontaneous pneumothorax	5%	0.01 – 20%	6, 7
Probability of BHD diagnosis based on HRCT alone (No confirmation needed)	80%	50 – 100%	9
Proportion of patients with BHD who undergo confirmatory testing for diagnosis	15%	10 – 40%	9
Among patients needing diagnostic confirmation, proportion of patients diagnosed based on skin biopsy	75%	50 – 80%	14, 17
Among patients needing diagnostic confirmation, proportion of patients diagnosed based on genetic testing	15%	10 – 30%	17
Probability of negative HRCT in patients with BHD (false negative rate)	5%	1 – 10%	9
False negative rate after confirmatory testing for BHD	10%	1 – 15%	17
Patients without BHD in which BHD is excluded based on HRCT alone (true negatives)	95%	90 – 100%	9
Proportion of patients without BHD who are given a BHD diagnosis based on HRCT (false positives)	5%	1 – 10%	9
Proportion of patients without BHD who undergo genetic testing	10%	5 – 20%	9
Probability of 1st recurrent pneumothorax: Patients with BHD without pleurodesis Patients with BHD after pleurodesis	 75% 30%	 50 – 80% 10 – 40%	33, 34
Probability of 2nd recurrent pneumothorax: Patients with BHD without pleurodesis Patients with BHD after pleurodesis	 60% 10%	 40 - 80% 5 – 20%	34

Abbreviations: BHD = Birt-Hogg-Dubé syndrome, HRCT = High-resolution computed tomography.

Table E2: Values of data used in our model for LAM

Parameters	**Base case value**	**Values used in sensitivity analysis**	**Reference**
Prevalence of LAM in patients with spontaneous pneumothorax	2.5%	0.01 – 10%	8
Probability of LAM diagnosis based on HRCT alone (no confirmation needed)	80%	50 – 100%	9, 20, 21
Proportion of LAM patients needing further diagnostic confirmation (VEGF-D and/or VATS)	15%	10 – 40%	9, 20, 21
Among patients needing further diagnostic confirmation, proportion of patients diagnosed based on VEGF-D levels	70%	50 - 80%	23, 24
Among patients needing further diagnostic confirmation, proportion of patients diagnosed based on transbronchial biopsy	15%	10 – 20%	25
Among patients needing further diagnostic confirmation, proportion of patients diagnosed based on surgical lung biopsy	15%	10 – 20%	25
Probability of negative HRCT in patients with LAM (false negative rate)	5%	1 – 10%	9, 20, 21
Patients without LAM in which LAM is excluded based on HRCT alone (true negatives)	95%	90 – 100%	9, 20, 21
Proportion of patients without LAM who are given a LAM diagnosis based on HRCT (false positives)	5%	1 – 10%	9, 20, 21
Proportion of patients without LAM who undergo VATS guided lung biopsy	10%	5 – 20%	9, 20, 21
Probability of 1st recurrent pneumothorax: Patients with LAM without pleurodesis Patients with LAM after pleurodesis	 73% 32%	 50 – 80% 10 – 40%	34
Probability of 2nd recurrent pneumothorax: Patients with LAM without pleurodesis Patients with LAM after pleurodesis	 60% 20%	 40 - 80% 5 – 25%	34

Abbreviations: HRCT = High-resolution computed tomography, LAM = Lymphangioleiomyomatosis, VATS = Video assisted thoracoscopic surgery, VEGF-D = Vascular endothelial growth factor - D.

Table E3: Values of data used in our model for PLCH

Parameters	**Base case value**	**Values used in sensitivity analysis**	**Reference**
Prevalence of PLCH in patients with spontaneous pneumothorax	0.5%	0.01 – 5%	4, 27-30
Probability of PLCH diagnosis based on HRCT alone (No confirmation needed)	70%	50 – 90%	9
Probability of PLCH diagnosis based on HRCT and VATS	25%	10 – 40%	9
Probability of negative HRCT in patients with PLCH (false negative rate)	5%	1 – 10%	9
Patients without PLCH in which PLCH is excluded based on HRCT alone (true negatives)	95%	90 – 100%	9
Proportion of patients without PLCH who are given a PLCH diagnosis based on HRCT (false positives)	5%	1 – 10%	9
Proportion of patients without PLCH who undergo VATS guided lung biopsy	10%	5 – 20%	9
Probability of 1st recurrent pneumothorax: Patients with PLCH without pleurodesis Patients with PLCH after pleurodesis	 58% 0%	 40 – 60% 0 – 10%	30
Probability of 2nd recurrent pneumothorax: Patients with PLCH without pleurodesis Patients with PLCH after pleurodesis	 20% 0%	 10 - 30% 0 – 10%	30

Abbreviations: HRCT = High-resolution computed tomography, PLCH = Pulmonary Langerhans cell Histiocytosis, VATS = Video assisted thoracoscopic surgery.

Table E4: Values of data used in the model. This table includes values used for the pneumothorax recurrence rates for primary spontaneous pneumothoraces, as well as quality of life and cost estimates for various procedures and tests.

Parameters	**Base case value**	**Values used in sensitivity analysis**	**Reference**
Probability of 1st recurrent pneumothorax:			
Patients with primary spontaneous pneumothorax without pleurodesis	30%	15 – 45%	31, 32
Patients with primary spontaneous pneumothorax after pleurodesis	4%	0 – 10%	
Probability of 2nd recurrent pneumothorax:			
Patients with primary spontaneous pneumothorax without pleurodesis	15%	10 – 20%	8
Patients with primary spontaneous pneumothorax after pleurodesis	0%	0 – 5%	
Quality of life:			
First pneumothorax	0.63		
Recurrent pneumothorax	0.50	N/A	8, 35
Pleurodesis	0.37		
VATS guided lung biopsy	0.35		
LAM and PLCH (Quality of life to diminish every month)	0.0017		
Costs:			
Pneumothorax*	$19,801.54	$10,000-30,000	
Pleurodesis#	$38,833.83	$25,000-50,000	
Transbronchial lung biopsy**	$1,351.77	$1,000-2,000	
VATS guided lung biopsy^	$24,412.57	$10,000-30,000	
HRCT chest	$180.20	$100-300	
Genetic testing for BHD	$1,500	$1,000-2,000	
Serum VEGF-D	$400	$200-1,000	
Skin biopsy***	$104.40	$75-200	

Abbreviations: BHD = Birt-Hogg-Dube syndrome, CPT = current procedural terminology code, DRG = diagnosis-related group code, HRCT = High-resolution computed tomography, LAM = Lymphangioleiomyomatosis, N/A = Not applicable, PLCH = Pulmonary Langerhans cell Histiocytosis, VATS = Video assisted thoracoscopic surgery, VEGF-D = Vascular endothelial growth factor - D.

* Cost of pneumothorax: DRG 201, CPT 99223, 99232 x 2, 32556, 71015 x 3

Cost of pleurodesis: DRG 163, CPT 99222, 99232 x 3, 32650, 71015 x 3

^ Cost of VATS guided lung biopsy: DRG 164, CPT 99222, 99232 x 3, 32607, 71015 x 3

** Cost of transbronchial lung biopsy: CPT 31628, 31632, 31632

*** Cost of skin biopsy: CPT 11100