

## SUPPLEMENTARY MATERIALS

**TITLE:**

Performance of Pulmonary Artery Dimensions Measured on High-resolution Computed Tomography Scan for Identifying Pulmonary Hypertension

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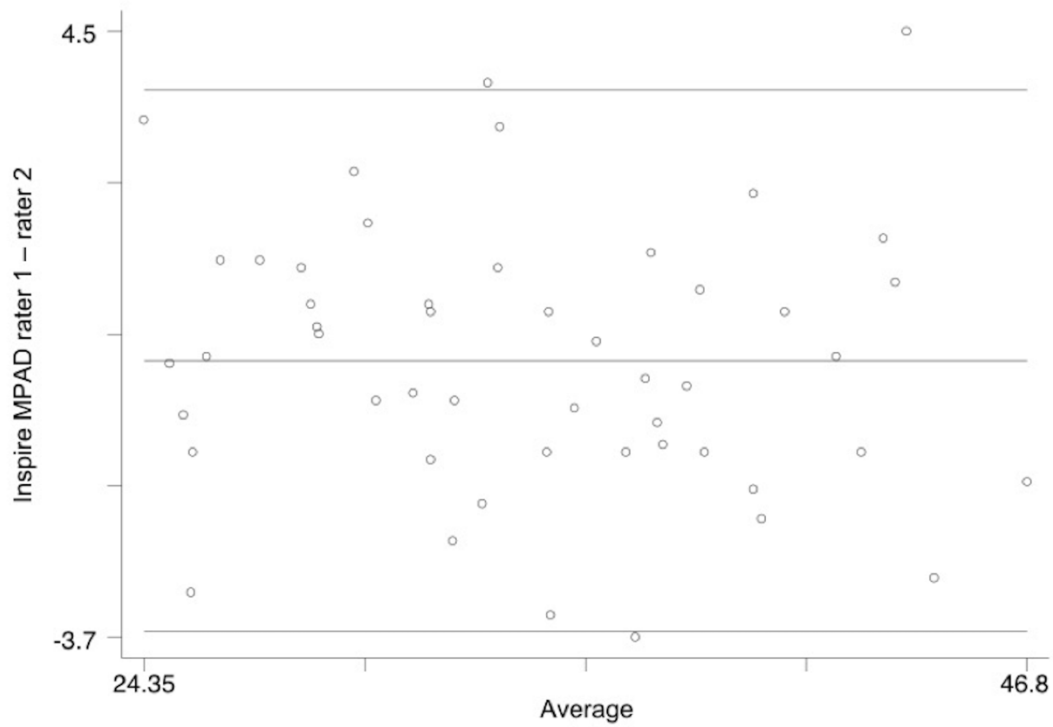
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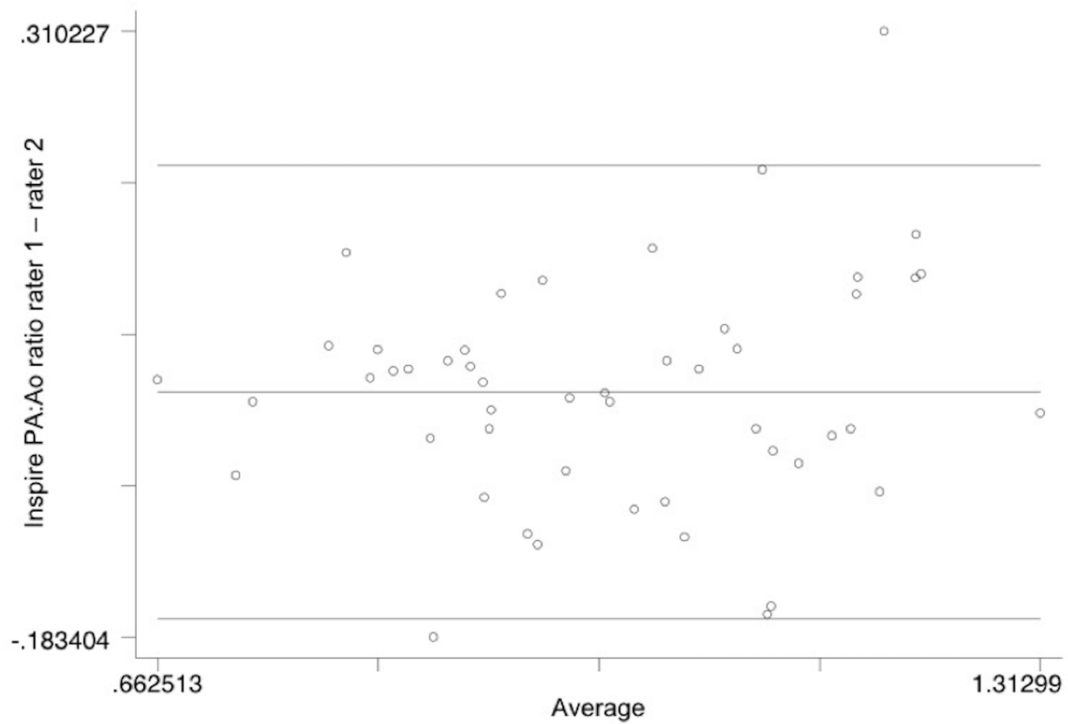
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Figure S1. Bland-Altman plot for agreement between radiologist and pulmonologist measurements of pulmonary artery diameter



Footnote: the x-axis is the average of the two PA diameter measurements (radiologist and pulmonologist) for each subject; the y-axis is the difference between the two PA diameter measurements for each subject; the mean difference = 0.044 (95% CI -0.476 to 0.564)

Figure S2. Bland-Altman plot for agreement between radiologist and pulmonologist measurements of the ratio of the pulmonary artery diameter: aorta diameter



Footnote: the x-axis is the average of the two PA:Ao measurements (radiologist and pulmonologist) for each subject; the y-axis is the difference between the two PA:Ao measurements for each subject; the mean difference = 0.016 (95% CI -0.010 to 0.042)

Table S1. Inter-rater reliability demonstrated as intraclass correlation coefficient.

		ICC	(95%CI)
Inspiration	MPAD	0.95	(0.92-0.97)
	PA:Ao ratio	0.83	(0.72-0.90)
	RPAD	0.78	(0.64-0.87)
	LPAD	0.83	(0.73-0.90)
	PA angle	0.84	(0.67-0.92)
Expiration	MPAD	0.86	(0.73-0.92)
	PA:Ao ratio	0.88	(0.79-0.93)
	RPAD	0.77	(0.29-0.91)
	LPAD	0.76	(0.45-0.88)
	PA angle	0.53	(0.28-0.71)

Footnote: ICC: intraclass correlation coefficient; CI: confident interval; MPAD: main pulmonary artery diameter; PA:Ao ratio: pulmonary artery to ascending aorta ratio; RPAD: right pulmonary artery diameter; LPAD: left pulmonary artery diameter; PA angle: pulmonary artery angle.

Table S2. Diagnostic performance of various HRCT-derived measures for pulmonary hypertension defined as a mean pulmonary artery pressure  $\geq 20$  mmHg on right heart catheterization.

	Interval	n	Sensitivity	Specificity	PPV	NPV
Inspiration						
MPAD $\geq 29$ mm	7 days	214	75.53	38.46	0.90	0.18
	14 days	295	76.83	38.89	0.90	0.19
	30 days	422	80.06	50.82	0.91	0.30
	60 days	620	80.27	47.31	0.90	0.30
PA:Ao ratio $\geq 1.0$	7 days	214	37.77	88.46	0.96	0.16
	14 days	295	39.77	88.89	0.96	0.17
	30 days	422	43.21	88.52	0.96	0.21
	60 days	620	42.88	89.25	0.96	0.22
MPAD and PA:Ao	7 days	214	36.17	88.46	0.96	0.16
	14 days	295	37.84	88.89	0.96	0.17
	30 days	422	41.55	91.80	0.97	0.21
	60 days	620	40.99	92.47	0.97	0.22
MPAD or PA:Ao	7 days	214	77.13	38.46	0.90	0.19
	14 days	295	78.76	38.89	0.90	0.20
	30 days	422	81.72	47.54	0.90	0.31
	60 days	620	82.16	44.09	0.89	0.30
Expiration						
MPAD $\geq 29$ mm	7 days	207	79.56	38.46	0.90	0.21
	14 days	286	81.60	36.11	0.90	0.22
	30 days	410	81.77	49.15	0.91	0.31
	60 days	600	82.85	43.68	0.90	0.30
PA:Ao ratio $\geq 1.0$	7 days	207	36.46	88.46	0.96	0.17
	14 days	286	37.60	88.89	0.96	0.17
	30 days	410	39.89	88.14	0.95	0.20
	60 days	600	41.13	86.21	0.95	0.20
MPAD and PA:Ao	7 days	207	35.91	88.46	0.96	0.17
	14 days	286	37.20	88.89	0.96	0.17
	30 days	410	39.03	88.14	0.95	0.20
	60 days	600	40.35	87.36	0.95	0.20
MPAD or PA:Ao	7 days	207	80.11	38.46	0.90	0.22
	14 days	286	82.00	36.11	0.90	0.22
	30 days	410	82.62	49.15	0.91	0.32
	60 days	600	83.63	42.53	0.90	0.31

Footnote: Interval describes time between HRCT and right heart catheterization; HRCT: high-resolution computed tomography; MPAD: main pulmonary artery diameter; PA:Ao ratio: pulmonary artery to ascending aorta ratio; PPV: positive predictive value; NPV: negative predictive value

Table S3. The sensitivity, specificity, area under the ROC curve and balance accuracy at different cutoffs for inspiratory MPAD and PA:Ao for pulmonary hypertension when defined as a mean pulmonary artery pressure  $\geq 25$  and  $\geq 20$  mmHg on right heart catheterization.

Cutoffs	MPAP $\geq 25$				MPAP $\geq 20$			
	Sensitivity	Specificity	AUC	Balance accuracy	Sensitivity	Specificity	AUC	Balance accuracy
MPAD (mm)								
28.0	90.40%	33.06%	0.618	61.73%	84.25%	36.56%	0.609	60.41%
28.5	88.80%	35.10%	0.622	61.95%	82.35%	37.63%	0.597	59.99%
29.0	88.00%	42.04%	0.650	65.02%	80.27%	47.31%	0.638	63.79%
29.5	86.13%	45.71%	0.659	65.92%	78.75%	55.91%	0.673	67.33%
30.0	83.47%	49.39%	0.664	66.43%	76.09%	61.29%	0.687	68.69%
30.5	80.27%	52.65%	0.661	66.46%	73.06%	65.59%	0.686	69.33%
31.0	75.47%	57.14%	0.662	66.31%	68.31%	69.89%	0.688	69.10%
31.5	72.80%	62.86%	0.678	67.83%	64.71%	75.27%	0.700	69.99%
32.0	68.53%	66.53%	0.675	67.53%	60.15%	76.34%	0.683	68.25%
32.5	65.87%	69.80%	0.678	67.84%	57.31%	79.57%	0.685	68.44%
33.0	62.13%	72.65%	0.673	67.39%	53.32%	79.57%	0.662	66.45%
33.5	59.20%	76.73%	0.675	67.97%	49.91%	82.80%	0.661	66.36%
34.0	55.73%	79.59%	0.677	67.66%	46.49%	84.95%	0.657	65.72%
PA:Ao ratio								
0.85	85.07%	41.22%	0.632	63.15%	79.13%	50.54%	0.648	64.84%
0.88	78.93%	55.10%	0.670	67.02%	70.78%	64.52%	0.677	67.65%
0.90	74.67%	60.82%	0.677	67.75%	66.03%	69.89%	0.680	67.96%
0.92	71.73%	64.90%	0.683	68.32%	62.62%	73.12%	0.679	67.87%
0.94	66.67%	70.61%	0.686	68.64%	57.69%	80.65%	0.692	69.17%
0.95	63.73%	72.65%	0.682	68.19%	54.65%	80.65%	0.677	67.65%
0.96	61.60%	75.10%	0.684	68.35%	52.37%	82.80%	0.676	67.59%
0.98	56.53%	79.18%	0.679	67.86%	47.06%	83.87%	0.655	65.47%
1.00	52.80%	84.49%	0.686	68.65%	42.88%	89.25%	0.661	66.07%
1.05	39.73%	91.02%	0.654	65.38%	31.12%	92.47%	0.618	61.80%
1.10	29.33%	94.69%	0.620	62.01%	22.96%	97.85%	0.604	60.41%

Footnote: ROC: receiver operating characteristic; MPAP: mean pulmonary arterial pressure; MPAD: main pulmonary artery diameter; PA:Ao: pulmonary artery to ascending aorta ratio; AUC: Area under the ROC curve; Balance accuracy: (sensitivity+specificity)/2

Table S4. The sensitivity, specificity, area under the ROC curve and balance accuracy at different cutoffs for inspiratory MPAD and PA:Ao for pulmonary hypertension when defined as a mean pulmonary artery pressure  $\geq 25$  mmHg in ILD and COPD subgroups.

Cutoffs	ILD				COPD			
	Sensitivity	Specificity	AUC	Balance accuracy	Sensitivity	Specificity	AUC	Balance accuracy
MPAD (mm)								
28.0	91.97%	29.59%	0.608	60.78%	90.32%	34.88%	0.626	62.60%
28.5	91.24%	31.63%	0.614	61.44%	89.25%	37.21%	0.632	63.23%
29.0	91.24%	37.76%	0.645	64.50%	88.17%	41.86%	0.650	65.02%
29.5	90.51%	39.80%	0.652	65.16%	87.10%	44.19%	0.656	65.65%
30.0	88.32%	42.86%	0.656	65.59%	82.80%	48.84%	0.658	65.82%
30.5	82.48%	44.90%	0.637	63.69%	78.49%	51.16%	0.648	64.83%
31.0	80.29%	50.00%	0.652	65.15%	75.27%	55.81%	0.655	65.54%
31.5	75.91%	55.10%	0.655	65.51%	75.27%	60.47%	0.679	67.87%
32.0	73.72%	57.14%	0.654	65.43%	68.82%	67.44%	0.681	68.13%
32.5	70.80%	61.22%	0.660	66.01%	66.67%	74.42%	0.705	70.55%
33.0	64.23%	64.29%	0.642	64.26%	63.44%	76.74%	0.701	70.09%
33.5	57.66%	69.39%	0.635	63.53%	63.44%	76.74%	0.701	70.09%
34.0	54.74%	75.51%	0.651	65.13%	59.14%	81.40%	0.703	70.27%
PA:Ao ratio								
0.85	89.05%	37.76%	0.634	63.41%	80.65%	51.16%	0.659	65.91%
0.88	82.48%	53.06%	0.678	67.77%	76.34%	69.77%	0.731	73.06%
0.90	80.29%	57.14%	0.687	68.72%	75.27%	72.09%	0.734	73.68%
0.92	77.37%	61.22%	0.693	69.30%	73.12%	72.09%	0.726	72.61%
0.94	70.07%	65.13%	0.677	67.60%	66.67%	79.07%	0.729	72.87%
0.95	64.96%	67.35%	0.662	66.16%	61.29%	79.07%	0.702	70.18%
0.96	64.96%	68.37%	0.667	66.67%	58.06%	81.40%	0.697	69.73%
0.98	57.66%	73.47%	0.656	65.57%	53.76%	83.72%	0.687	68.74%
1.00	52.55%	80.61%	0.666	66.58%	50.54%	88.37%	0.695	69.46%
1.05	35.04%	90.82%	0.629	62.93%	36.56%	95.35%	0.660	65.96%
1.10	25.55%	95.92%	0.607	60.74%	29.03%	95.35%	0.622	62.19%

Footnote: ROC: receiver operating characteristic; MPAD: main pulmonary artery diameter; PA:Ao: pulmonary artery to ascending aorta ratio; ILD: interstitial lung disease; COPD: chronic obstructive pulmonary disease; AUC: Area under the ROC curve; Balance accuracy = (sensitivity+specificity)/2

Table S5. The sensitivity, specificity, area under the ROC curve and balance accuracy at different cutoffs for inspiratory MPAD and PA:Ao for pulmonary hypertension when defined as a mean pulmonary artery pressure  $\geq 20$  mmHg in ILD and COPD subgroups.

Cutoffs	ILD				COPD			
	Sensitivity	Specificity	AUC	Balance accuracy	Sensitivity	Specificity	AUC	Balance accuracy
MPAD (mm)								
28.0	86.53%	33.33%	0.599	59.93%	84.92%	50.00%	0.675	67.46%
28.5	84.97%	33.33%	0.592	59.15%	83.33%	50.00%	0.667	66.67%
29.0	83.94%	42.86%	0.634	63.40%	82.54%	70.00%	0.763	76.27%
29.5	83.42%	47.62%	0.655	65.52%	80.95%	70.00%	0.755	75.48%
30.0	81.35%	52.38%	0.669	66.87%	76.98%	80.00%	0.785	78.49%
30.5	76.17%	52.38%	0.643	64.28%	73.02%	80.00%	0.765	76.51%
31.0	73.58%	59.52%	0.666	66.55%	69.05%	80.00%	0.745	74.53%
31.5	69.43%	66.67%	0.681	68.05%	68.52%	90.00%	0.791	79.26%
32.0	66.84%	66.67%	0.668	66.76%	61.11%	90.00%	0.756	75.56%
32.5	63.21%	69.05%	0.661	66.13%	57.94%	100.00%	0.790	78.97%
33.0	56.99%	69.05%	0.630	63.02%	54.76%	100.00%	0.774	77.38%
33.5	50.78%	73.81%	0.623	62.30%	54.76%	100.00%	0.774	77.38%
34.0	46.63%	78.57%	0.626	62.60%	50.00%	100.00%	0.750	75.00%
PA:Ao ratio								
0.80	90.67%	35.71%	0.632	63.19%	86.51%	60.00%	0.733	73.26%
0.82	86.53%	40.48%	0.635	63.51%	82.54%	60.00%	0.713	71.27%
0.85	84.46%	52.38%	0.684	68.42%	73.81%	70.00%	0.719	71.91%
0.88	73.58%	59.52%	0.666	66.55%	65.87%	90.00%	0.779	77.94%
0.90	70.98%	64.29%	0.676	67.64%	64.29%	90.00%	0.771	77.15%
0.92	67.36%	66.67%	0.670	67.02%	62.70%	90.00%	0.764	76.35%
0.94	61.66%	73.81%	0.677	67.74%	55.56%	90.00%	0.728	72.78%
0.95	56.99%	73.81%	0.654	65.40%	51.59%	90.00%	0.708	70.80%
0.96	56.48%	73.81%	0.651	65.15%	48.41%	90.00%	0.692	69.21%
0.98	49.22%	76.19%	0.627	62.71%	44.44%	90.00%	0.672	67.22%
1.00	44.04%	85.71%	0.649	64.88%	40.48%	90.00%	0.652	65.24%
1.05	27.46%	90.48%	0.590	58.97%	28.57%	100.00%	0.643	64.29%
1.10	19.69%	97.62%	0.587	58.66%	23.02%	100.00%	0.615	61.51%

Footnote: ROC: receiver operating characteristic; MPAD: main pulmonary artery diameter; PA:Ao: pulmonary artery to ascending aorta ratio; ILD: interstitial lung disease; COPD: chronic obstructive pulmonary disease; AUC: Area under the ROC curve; Balance accuracy: (sensitivity+specificity)/2