

Table S1 Imaging parameters in different centers for CT pulmonary angiography images

Parameter	Center 1	Center 2	Center 3
Manufacturer	United Imaging Healthcare	Siemens Healthineers	GE HealthCare
Device	uCT 960+	SOMATOM Force	Revolution
Scanning plane	Transverse	Transverse	Transverse
Slice thickness	1 mm	1 mm	0.625 mm
Slices interval	1 mm	1 mm	0.625 mm
kVp	100	90	140
Resolution	512×512	512×512	512×512
Pixel spacing	0.68×0.68	0.65×0.65	0.78×0.78
Iodine concentration	35 g/100 mL	35 g/100 mL	35 g/100 mL
Iodine	50 mL	50 mL	40 mL
Normal saline	40 mL	30 mL	40 mL
Injection rate	4–5 mL/s	5 mL/s	5 mL/s
Bolus tracking threshold	80–100 HU	80–100 HU	80–100 HU

Table S2 Comparison of patient-level performance between the stand-alone AI and six readers

Patient-level analysis	Subgroup	TP	FP	FN	TN	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)	Youden index (95% CI)	Youden index difference*
Stand-alone AI		53	8	2	133	0.96 (0.87–0.99)	0.94 (0.89–0.97)	0.86 (0.76–0.93)	0.98 (0.94–0.99)	0.90 (0.90–0.96)	–
Reader 1	Without AI	47	4	8	137	0.85 (0.73–0.92)	0.97 (0.92–0.98)	0.92 (0.81–0.96)	0.94 (0.89–0.97)	0.82 (0.72–0.91)	–
	With AI	54	5	1	136	0.98 (0.90–0.99)	0.96 (0.91–0.98)	0.91 (0.81–0.96)	0.99 (0.95–0.99)	0.94 (0.89–0.98)	+0.12
Reader 2	Without AI	42	4	13	137	0.76 (0.63–0.85)	0.97 (0.92–0.98)	0.91 (0.79–0.96)	0.91 (0.85–0.94)	0.73 (0.61–0.84)	–
	With AI	53	10	2	131	0.96 (0.87–0.99)	0.92 (0.87–0.96)	0.84 (0.73–0.91)	0.98 (0.94–0.99)	0.89 (0.82–0.95)	+0.16
Reader 3	Without AI	45	5	10	136	0.81 (0.69–0.89)	0.96 (0.91–0.98)	0.90 (0.78–0.95)	0.93 (0.87–0.96)	0.78 (0.67–0.88)	–
	With AI	53	7	2	134	0.96 (0.87–0.99)	0.95 (0.90–0.97)	0.88 (0.77–0.94)	0.98 (0.94–0.99)	0.91 (0.84–0.96)	+0.13
Reader 4	Without AI	42	10	13	131	0.76 (0.63–0.85)	0.92 (0.87–0.96)	0.80 (0.68–0.8)	0.90 (0.85–0.94)	0.69 (0.56–0.80)	–
	With AI	53	11	2	130	0.96 (0.87–0.99)	0.92 (0.86–0.95)	0.82 (0.71–0.90)	0.98 (0.94–0.99)	0.88 (0.81–0.94)	0.19
Reader 5	Without AI	49	2	6	139	0.89 (0.78–0.94)	0.98 (0.94–0.99)	0.96 (0.86–0.98)	0.95 (0.91–0.98)	0.87 (0.92–0.95)	–
	With AI	53	3	2	138	0.96 (0.87–0.99)	0.97 (0.93–0.99)	0.94 (0.85–0.98)	0.98 (0.94–0.99)	0.94 (0.88–0.98)	+0.07
Reader 6	Without AI	50	3	5	138	0.90 (0.80–0.96)	0.97 (0.93–0.99)	0.94 (0.84–0.98)	0.96 (0.92–0.98)	0.88 (0.80–0.95)	–
	With AI	52	5	3	136	0.94 (0.85–0.98)	0.96 (0.91–0.98)	0.91 (0.81–0.96)	0.97 (0.93–0.99)	0.91 (0.83–0.97)	+0.03
Mean	Without AI	–	–	–	–	0.83 (0.78–0.86)	0.96 (0.95–0.97)	0.90 (0.86–0.93)	0.93 (0.91–0.95)	0.80 (0.75–0.84)	–
	With AI	–	–	–	–	0.96 (0.93–0.97)	0.95 (0.93–0.96)	0.88 (0.84–0.91)	0.98 (0.97–0.99)	0.91 (0.88–0.93)	+0.11

*, Youden index values were higher for examinations with AI support than those without it.

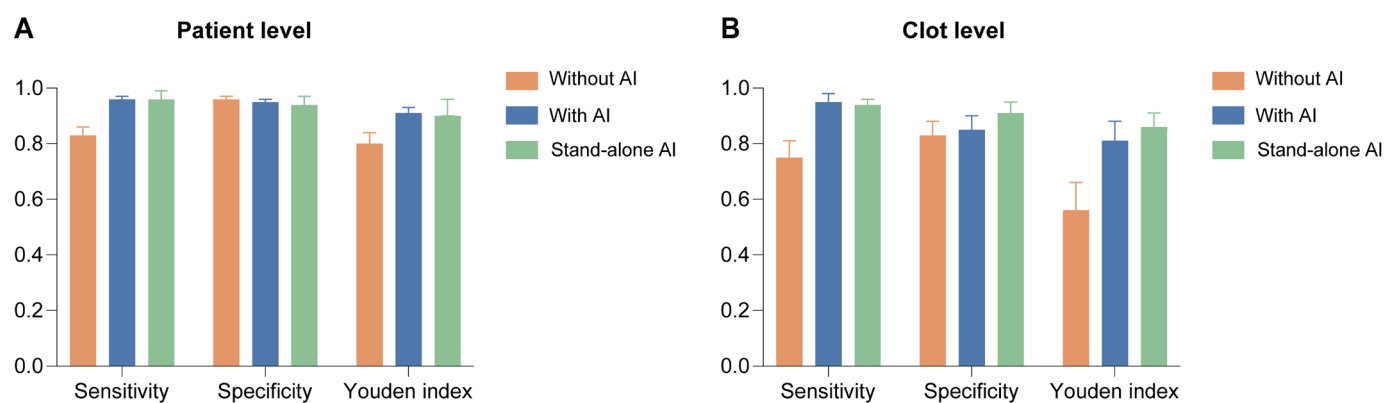


Figure S1 Comparison of diagnostic performance between stand-alone AI, readers with AI assistance (mean across readers), and readers without AI assistance (mean across readers). (A) Patient level. (B) Clot level.

Table S3 Comparison of clot-level performance between the stand-alone AI and six readers

Clot-level analysis	Subgroup	TP	FP	FN	TN	Sensitivity (95% CI)	Specificity (95% CI)	PPV (95% CI)	NPV (95% CI)	Youden index (95% CI)	Youden index difference*
Stand-alone AI		230	12	13	133	0.94 (0.91–0.96)	0.91 (0.86–0.95)	0.95 (0.91–0.97)	0.91 (0.85–0.94)	0.86 (0.80–0.91)	–
Reader 1	Without AI	163	35	80	137	0.67 (0.60–0.72)	0.79 (0.73–0.84)	0.82 (0.76–0.87)	0.63 (0.56–0.69)	0.46 (0.38–0.55)	–
	With AI	232	23	11	136	0.95 (0.92–0.97)	0.85 (0.79–0.90)	0.90 (0.86–0.93)	0.92 (0.88–0.93)	0.80 (0.74–0.86)	+0.34
Reader 2	Without AI	164	21	79	137	0.67 (0.61–0.73)	0.86 (0.80–0.91)	0.88 (0.83–0.92)	0.63 (0.56–0.69)	0.54 (0.46–0.62)	–
	With AI	231	21	12	131	0.95 (0.91–0.97)	0.86 (0.79–0.90)	0.91 (0.87–0.94)	0.91 (0.85–0.95)	0.81 (0.75–0.87)	+0.27
Reader 3	Without AI	183	31	60	136	0.75 (0.69–0.80)	0.81 (0.74–0.86)	0.85 (0.80–0.89)	0.69 (0.62–0.75)	0.56 (0.48–0.64)	–
	With AI	231	17	12	134	0.96 (0.87–0.99)	0.95 (0.90–0.97)	0.88 (0.77–0.94)	0.98 (0.94–0.99)	0.91 (0.84–0.96)	+0.35
Reader 4	Without AI	154	44	89	131	0.63 (0.57–0.69)	0.74 (0.67–0.96)	0.93 (0.89–0.96)	0.59 (0.52–0.65)	0.38 (0.29–0.47)	–
	With AI	231	24	12	130	0.95 (0.91–0.97)	0.84 (0.77–0.89)	0.90 (0.86–0.93)	0.91 (0.85–0.95)	0.79 (0.72–0.85)	+0.41
Reader 5	Without AI	219	30	24	139	0.90 (0.85–0.93)	0.82 (0.75–0.87)	0.87 (0.83–0.91)	0.85 (0.79–0.89)	0.72 (0.65–0.79)	–
	With AI	237	22	6	138	0.97 (0.94–0.98)	0.86 (0.80–0.90)	0.91 (0.87–0.94)	0.95 (0.91–0.98)	0.83 (0.78–0.89)	+0.11
Reader 6	Without AI	224	43	19	138	0.92 (0.88–0.94)	0.76 (0.69–0.81)	0.83 (0.79–0.87)	0.87 (0.81–0.92)	0.68 (0.61–0.75)	–
	With AI	233	27	10	136	0.95 (0.92–0.97)	0.83 (0.76–0.88)	0.89 (0.85–0.92)	0.93 (0.87–0.96)	0.79 (0.73–0.85)	+0.11
Mean	Without AI	–	–	–	–	0.75 (0.70–0.81)	0.83 (0.77–0.88)	0.86 (0.84–0.88)	0.69 (0.67–0.72)	0.56 (0.44–0.66)	–
	With AI	–	–	–	–	0.95 (0.92–0.98)	0.85 (0.79–0.90)	0.91 (0.89–0.92)	0.92 (0.90–0.94)	0.81 (0.72–0.88)	+0.25

*, Youden index values were higher for examinations with AI support than for those without it.

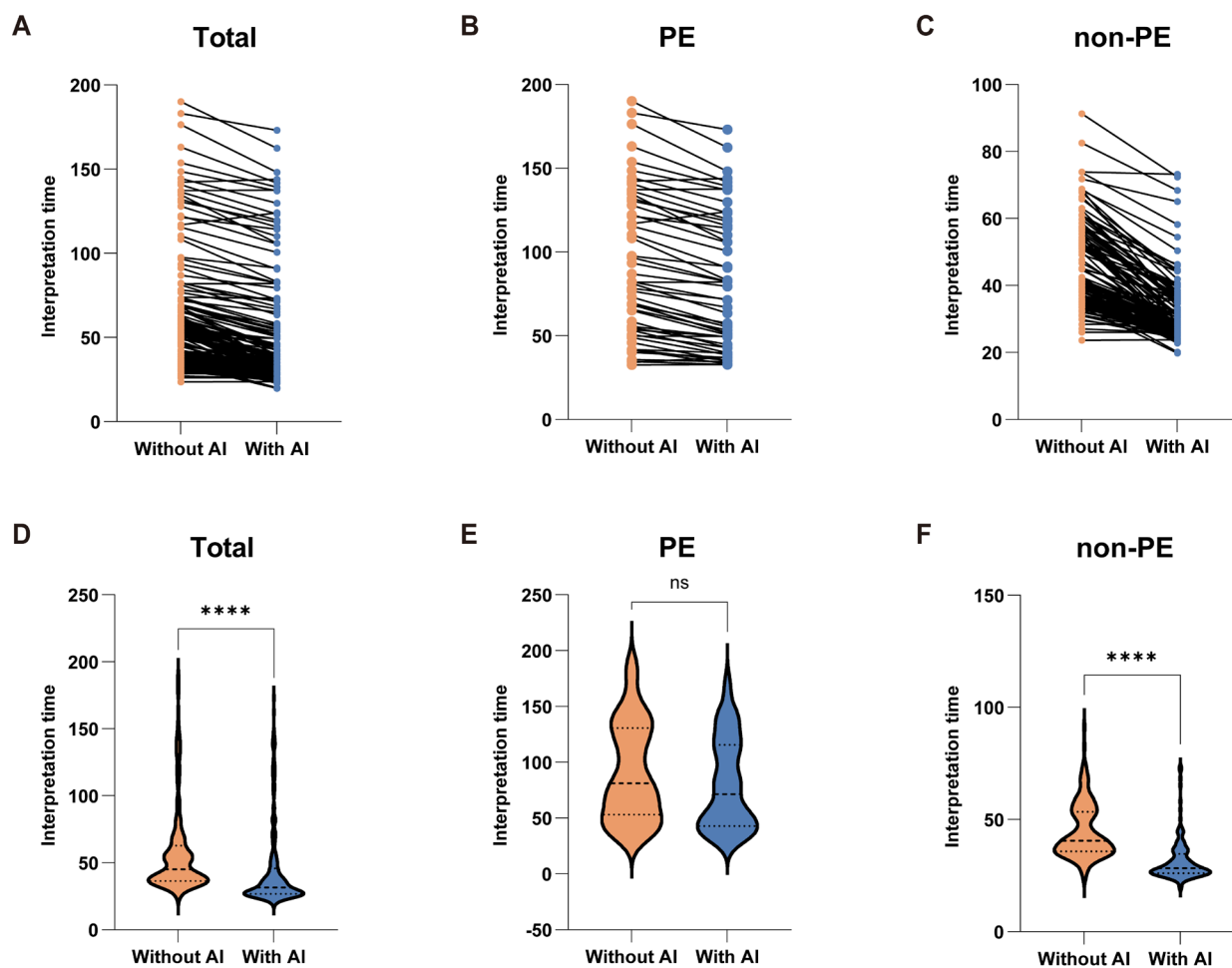


Figure S2 Interpretation times for readers with <5 years of experience with and without AI support. (A,D) Total cases. (B,E) PE-positive cases. (C,F) PE-negative cases. AI assistance significantly reduced overall interpretation time, with a more pronounced reduction observed in PE-negative cases as compared to PE-positive cases. Statistical significance in violin plots was assessed via the nonparametric test for overall group comparisons. ns, $P \geq 0.05$; ****, $P < 0.0001$.

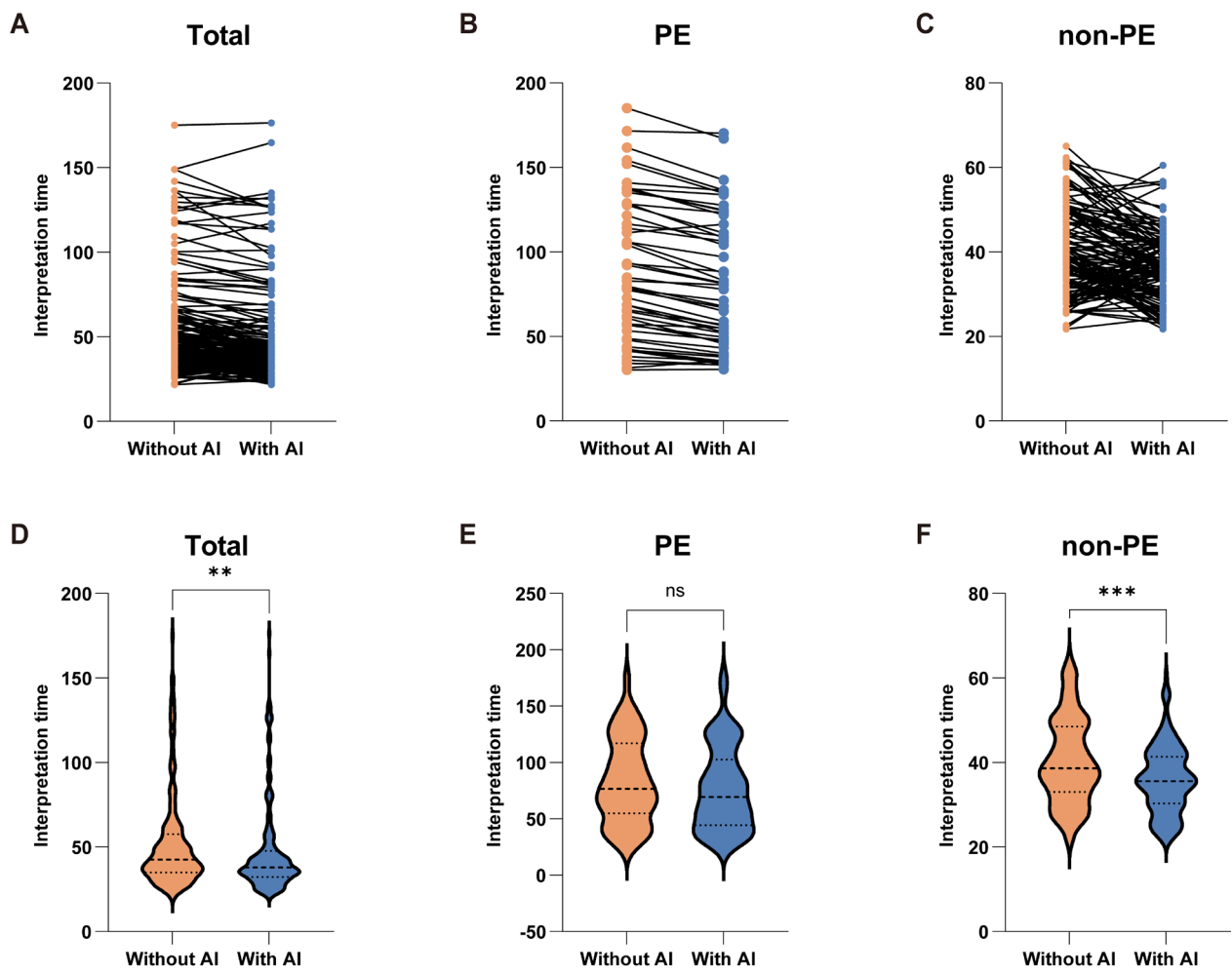


Figure S3 Interpretation times for readers with ≥ 5 years of experience with and without AI support. (A,D) Total cases. (B,E) PE-positive cases. (C,F) PE-negative cases. AI assistance significantly reduced overall interpretation time, with a more pronounced reduction observed in PE-negative cases as compared to PE-positive cases. Statistical significance in violin plots was assessed via the nonparametric test for overall group comparisons. ns, $P \geq 0.05$; **, $P < 0.01$; ***, $P < 0.001$.

Table S4 Mean interpretation time per screening examination for each radiologist reading with and without AI support

Reader	Experience level (years)	Interpretation time without AI (sec)	Interpretation time with AI (sec)	Interpretation time difference*
Reader 1	1	55.3	44.2	11.1 (20%)
Reader 2	1.5	59.0	45.0	14.0 (24%)
Reader 3	2	64.2	48.0	16.2 (25%)
Reader 4	2	52.4	43.3	9.1 (17%)
Reader 5	5	48.5	45.4	3.1 (6%)
Reader 6	6	56.4	50.1	6.3 (11%)

*, the proportion of reduction in mean interpretation time with AI support.

Table S5 AI-induced prediction modifications by readers at the clot level

Reader	Experience level (years)	Changed prediction (%)	Incorrectly induced (%)	Correctly induced (%)
Reader 1	1	79/243 (32.5)	5/243 (2.1)	74/243 (30.5)
Reader 2	1.5	75/243 (30.9)	4/243 (1.7)	71/243 (29.2)
Reader 3	2	58/243 (23.9)	5/243 (2.1)	53/243 (21.8)
Reader 4	2	85/243 (35.0)	4/243 (1.7)	81/243 (33.3)
Reader 5	5	20/243 (8.2)	1/243 (0.4)	19/243 (7.8)
Reader 6	6	17/243 (7.0)	4/243 (1.7)	13/243 (5.4)
Experience (<5 years)	–	NA (30.6)	NA (1.9)	NA (28.7)
Experience (≥5 years)	–	NA (7.6)	NA (1.0)	NA (6.6)
Mean	–	NA (22.9)	NA (1.6)	NA (21.3)

Table S6 AI-induced prediction modifications by readers in non-PE patients

Reader	Experience level (years)	Changed prediction (%)	Incorrectly induced (%)	Correctly induced (%)
Reader 1	1	3/141 (2.1)	2/141 (1.4)	1/141 (0.7)
Reader 2	1.5	8/141 (5.7)	7/141 (5.0)	1/141 (0.7)
Reader 3	2	6/141 (4.3)	4/141 (2.8)	2/141 (1.4)
Reader 4	2	15/141 (10.6)	8/141 (5.7)	7/141 (5.0)
Reader 5	5	3/141 (2.1)	2/141 (1.4)	1/141 (0.7)
Reader 6	6	1/141 (0.7)	1/141 (0.7)	0/141 (0)
Experience (<5 years)	–	NA (5.7)	NA (3.7)	NA (2.0)
Experience (≥5 years)	–	NA (1.4)	NA (1.1)	NA (0.4)
Mean	–	NA (4.3)	NA (2.8)	NA (1.4)