

**Table S1** Univariate analysis of postoperative outcomes based on the three groups treated with different total intravenous crystalloid infusions 24 hours postoperatively

Postoperative outcome	Total intravenous crystalloid infusion 24 h postoperatively				P value
	Total (n=563)	Restrictive group (<1,080 mL) (n=136)	Moderate group (1,080–<1,410 mL) (n=272)	Liberal group (≥1,410 mL) (n=155)	
Postoperative pulmonary complications	160	44	53	63	–
Acute respiratory distress syndrome	4 (0.7%)	2 (1.5%)	1 (0.4%)	1 (0.6%)	0.494
Reintubation	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	–
Pulmonary embolism	3 (0.5%)	2 (1.5%)	1 (0.4%)	0 (0.0%)	0.189
Need for bedside bronchoscopy	4 (0.7%)	4 (2.9%)	0 (0.0%)	0 (0.0%)	0.003
Prolonged air leak	13 (2.3%)	5 (3.7%)	6 (2.2%)	2 (1.3%)	0.403
Failure to expand	13 (2.3%)	1 (0.7%)	6 (2.2%)	6 (3.9%)	0.179
Atelectasis	13 (2.3%)	6 (4.4%)	2 (0.7%)	5 (3.2%)	0.035
Pneumonia	110 (19.5%)	24 (17.6%)	37 (13.6%)	49 (31.6%)	<0.001
Patients with pulmonary complications	136 (24.2%)	36 (26.5%)	45 (16.5%)	55 (35.5%)	<0.001
Acute kidney injury	13 (2.3%)	3 (2.2%)	8 (2.9%)	2 (1.3%)	0.523
In-hospital mortality	0	0	0	0	–
Readmission within 30 days	6 (1.1%)	0 (0.0%)	1 (0.4%)	5 (3.2%)	0.011
Prolonged hospital stay	70 (12.4%)	25 (18.4%)	31 (11.4%)	14 (9.0%)	0.042
Postoperative length of stay, days	5.9±2.1	5.9±1.9	5.8±2.1	5.9±2.3	0.819
Total hospital care costs (yuan renminbi)	58,324.0±9730.7	58,388.4±8998.8	57,830.2±10,036.1	59,133.9±9,808.9	0.411

Values are presented as mean ± standard deviation, n or n (%).

**Table S2** Assignment of variables in multivariate analysis of the three groups treated with different total intravenous crystalloid infusions 24 hours postoperatively

Variable	Assignment instruction
ASA score	ASA I =1, ASA II =2, ASA III =3
Diabetes mellitus	No =0, yes =1
Length of operation	<2 h =1, 2 h =2
Total intravenous crystalloid infusion in the postoperative 24 h	<1,080 mL =1, 1,080–<1,410 mL =2, ≥1,410 mL =3

ASA, American Society of Anesthesiologists.

**Table S3** Full-model multivariate results of the three groups treated with different total intravenous crystalloid infusions 24 hours postoperatively

Variables	Pneumonia			Pulmonary complications		
	OR	95% CI	P value	OR	95% CI	P value
ASA score			0.007			<0.001
I	1.000			1.000		
II	3.251	1.466–7.211	0.004	4.164	1.883–9.208	<0.001
III	0.469	0.103–2.131	0.327	0.363	0.081–1.630	0.186
Diabetes mellitus						
No	1.000			1.000		
Yes	0.188	0.056–0.628	0.007	0.246	0.086–0.702	0.009
Length of operation						
<2 h	1.000			1.000		
2 h–	0.940	0.599–1.475	0.788	1.122	0.735–1.713	0.594
Total intravenous crystalloid infusion 24 h postoperatively			<0.001			<0.001
<1,080 mL	1.390	0.779–2.478	0.265	1.815	1.083–3.043	0.024
1,080–<1,410 mL	1.000			1.000		
≥1,410 mL	2.869	1.750–4.703	<0.001	2.692	1.684–4.305	<0.001

Results of binary logistics regression are presented as adjusted OR, 95% CI, and P value. ASA, American Society of Anesthesiologists; OR, odds ratio.

**Table S4** Clinical characteristics of patients in the 4 groups treated with different total intravenous crystalloid infusions 24 hours postoperatively

Characteristic	Total intravenous crystalloid infusion 24 h postoperatively					P value
	Total (n=563)	Quartile 1 (n=136), <1,080 mL	Quartile 2 (n=136), 1,080–<1,290 mL	Quartile 3 (n=136), 1,290–<1,410 mL	Quartile 4 (n=155), ≥1,410 mL	
ASA score						0.001
I	472 (83.8%)	100 (73.5%)	127 (93.4%)	117 (86.0%)	128 (82.6%)	
II	68 (12.1%)	29 (21.3%)	6 (4.4%)	15 (11.0%)	18 (11.6%)	
III	23 (4.1%)	7 (5.1%)	3 (2.2%)	4 (2.9%)	9 (5.8%)	
Age (year)	63.2±10.7	64.1±11.3	63.3±9.9	62.0±11.0	63.4±10.5	0.440
Gender (female/male)	336/227	76/60	82/54	82/54	96/59	0.756
Weight, kg	61.4±9.8	62.3±10.3	60.5±9.6	60.7±9.6	61.9±9.7	0.354
Smoking	156 (27.7%)	35 (25.7%)	47 (34.6%)	36 (26.5%)	38 (24.5%)	0.227
Diabetes mellitus	48 (8.5%)	25 (18.4%)	2 (1.5%)	13 (9.6%)	8 (5.2%)	<0.001
Coronary heart disease	9 (1.6%)	3 (2.2%)	2 (1.5%)	2 (1.5%)	2 (1.3%)	0.937
FEV1, L	2.3±0.6	2.3±0.6	2.3±0.6	2.3±0.5	2.3±0.6	0.930
FVC, L	2.9±0.7	2.9±0.8	3.0±0.8	2.9±0.7	2.9±0.8	0.898
PEF, L/s	4.7 ±1.9	4.9 ±1.8	4.8 ±2.0	4.3 ±1.8	4.7 ±1.9	0.033
FEV1%	(91.1±17.2)%	(90.9±18.5)%	(91.4±18.2)%	(91.3±16.4)%	(90.8±16.1)%	0.986
FVC%	(91.3±15.7)%	(89.8±15.8)%	(92.6±16.6)%	(90.5±14.8)%	(92.1±15.6)%	0.410
PEF%	(67.6±24.0)%	(70.4±20.4)%	(69.9±27.4)%	(62.4±22.6)%	(67.9±24.3)%	0.011
Intraoperative bleeding, mL	48.8±45.1	49.4±69.1	42.1±22.0	52.6±44.5	50.6±31.9	0.239
Intraoperative blood transfusion, mL	0	0	0	0	0	-
Length of operation, min	133.3±36.4	125.6±33.0	133.8±41.5	138.4±37.7	135.1±32.2	0.012
Amount of intraoperative fluids, mL	1,545.3±415.2	1,500.7±386.1	1,609.3±446.4	1,547.8±419.8	1,526.0±404.4	0.165
Infusion rate of intraoperative total fluids, mL/kg/h	12.1±3.9	12.2±3.7	12.8±4.2	11.7±3.7	11.6±3.8	0.028
Total intravenous crystalloid infusion 24 h postoperatively, mL	1,254.7±278.0	877.4±120.2	1,194.5±61.8	1,324.0±36.2	1,577.8±163.5	<0.001
Total intravenous colloid infusion 24 h postoperatively, mL	0	0	0	0	0	-
NSCLC staging						0.003
IA	455 (80.8%)	107 (78.7%)	112 (82.4%)	112 (82.4%)	124 (80.0%)	
IB	39 (6.9%)	8 (5.9%)	9 (6.6%)	12 (8.8%)	10 (6.5%)	
IIA	34 (6.0%)	9 (6.6%)	1 (0.7%)	9 (6.6%)	15 (9.7%)	
IIB	2 (0.4%)	1 (0.7%)	0 (0.0%)	1 (0.7%)	0 (0.0%)	
IIIA	33 (5.9%)	11 (8.1%)	14 (10.3%)	2 (1.5%)	6 (3.9%)	
Postoperative pathology						0.180
Adenocarcinoma	513 (91.1%)	125 (91.9%)	118 (86.8%)	129 (94.9%)	141 (91.0%)	
Squamous cell carcinoma	43 (7.6%)	10 (7.4%)	14 (10.3%)	7 (5.1%)	12 (7.7%)	
Adenosquamous carcinoma	7 (1.2%)	1 (0.7%)	4 (2.9%)	0 (0.0%)	2 (1.3%)	

Values are presented as mean ± standard deviation, n or n (%). ASA, American Society of Anesthesiologists; FEV1, forced expiratory volume in 1 s; FEV1%, FEV1 as percentage of predicted; FVC, forced vital capacity; FVC%, FVC as percentage of predicted; NSCLC, non-small cell lung cancer; PEF, peak expiratory flow; PEF%, PEF as percentage of predicted.

**Table S5** Univariate analysis of postoperative outcomes based on the 4 groups treated with different total intravenous crystalloid infusions 24 hours postoperatively

Postoperative outcome	Total intravenous crystalloid infusion 24 h postoperatively					P value
	Total (n=563)	Quartile 1 (n=136), <1,080 mL	Quartile 2 (n=136), 1,080–<1,290 mL	Quartile 3 (n=136), 1,290–<1,410 mL	Quartile 4 (n=155), ≥1,410 mL	
Postoperative pulmonary complications	160	44	29	24	63	-
Acute respiratory distress syndrome	4 (0.7%)	2 (1.5%)	1 (0.7%)	0 (0.0%)	1 (0.6%)	0.423
Reintubation	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	-
Pulmonary embolism	3 (0.5%)	2 (1.5%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	0.193
Need for bedside bronchoscopy	4 (0.7%)	4 (2.9%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0.010
Prolonged air leak	13 (2.3%)	5 (3.7%)	2 (1.5%)	4 (2.9%)	2 (1.3%)	0.473
Failure to expand	13 (2.3%)	1 (0.7%)	3 (2.2%)	3 (2.2%)	6 (3.9%)	0.329
Atelectasis	13 (2.3%)	6 (4.4%)	0 (0.0%)	2 (1.5%)	5 (3.2%)	0.024
Pneumonia	110 (19.5%)	24 (17.6%)	22 (16.2%)	15 (11.0%)	49 (31.6%)	<0.001
Patients with pulmonary complications	136 (24.2%)	36 (26.5%)	25 (18.4%)	20 (14.7%)	55 (35.5%)	<0.001
Acute kidney injury	13 (2.3%)	3 (2.2%)	4 (2.9%)	4 (2.9%)	2 (1.3%)	0.730
In-hospital mortality, n	0	0	0	0	0	-
Readmission within 30 days	6 (1.1%)	0 (0.0%)	0 (0.0%)	1 (0.7%)	5 (3.2%)	0.015
Prolonged hospital stay	70 (12.4%)	25 (18.4%)	18 (13.2%)	13 (9.6%)	14 (9.0%)	0.066
Postoperative length of stay, days	5.9±2.1	5.9±1.9	6.0±2.3	5.7±2.0	5.9±2.3	0.628
Total hospital care costs (yuan renminbi)	58,324.0±9,730.7	58,388.4±8,998.8	56,969.0±11,300.1	58,691.4±8544.4	59,133.9±9,808.9	0.272

Values are presented as mean ± standard deviation, n or n (%).

**Table S6** Assignment of variables in multivariate analysis of the 4 groups treated with different total intravenous crystalloid infusions 24 hours postoperatively

Variable	Assignment instruction
ASA score	ASA I =1, ASA II =2, ASA III =3
Diabetes mellitus	No =0, Yes =1
Length of operation	<2 h =1, 2 h– =2
Infusion rate of intraoperative total fluids (quartile)	<9.3 mL/kg/h =1, 9.3–<11.6 mL/kg/h =2, 11.6–<14.2 mL/kg/h =3, ≥14.2 mL/kg/h =4
NSCLC staging	IA =1, IB =2, IIA =3, IIB =4, IIIA =5
PEF%	<60% =2, 60%– =1
Total intravenous crystalloid infusion 24 h postoperatively (quartile)	<1,080 mL =1, 1,080–<1,290 mL =2, 1,290–<1,410 mL =3, ≥1,410 mL =4

ASA, American Society of Anesthesiologists; NSCLC, non-small cell lung cancer; PEF%, peak expiratory flow as a percentage of predicted.

**Table S7** Effect of total intravenous crystalloid infusion 24 hours postoperatively on postoperative outcomes (4 groups)

Postoperative outcome	Total intravenous crystalloid infusion 24 h postoperatively				TOTAL P value
	Quartile 1 (n=136), <1080 mL	Quartile 2 (n=136), 1080–<1290 mL	Quartile 3 (n=136), 1290–<1410 mL	Quartile 4 (n=155), ≥1410 mL	
<b>Postoperative pulmonary complications</b>					
Acute respiratory distress syndrome, n (%)	2 (1.5%)	1 (0.7%)	0 (0.0%)	1 (0.6%)	0.660
Reintubation, n (%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	–
Pulmonary embolism, n (%)	2 (1.5%)	1 (0.7%)	0 (0.0%)	0 (0.0%)	0.903
Need for bedside bronchoscopy, n (%)	4 (2.9%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	1.000
Prolonged air leak, n (%)	5 (3.7%)	2 (1.5%)	4 (2.9%)	2 (1.3%)	0.518
Failure to expand, n (%)	1 (0.7%)	3 (2.2%)	3 (2.2%)	6 (3.9%)	0.458
Atelectasis, n (%)	6 (4.4%)	0 (0.0%)	2 (1.5%)	5 (3.2%)	0.490
Pneumonia					<0.001
n (%)	24 (17.6%)	22 (16.2%)	15 (11.0%)	49 (31.6%)	
OR (95% CI), P value	1.716 (0.812–3.628), 1.566 (0.741–3.312), 0.157 0.240		1	3.702 (1.908–7.186), <0.001	
<b>Patients with pulmonary complications</b>					
n (%)	36 (26.5%)	25 (18.4%)	20 (14.7%)	55 (35.5%)	<0.001
OR (95% CI), P value	2.007 (1.036–3.889), 1.331 (0.667–2.654), 0.039 0.417		1	3.250 (1.774–5.956), <0.001	
Acute kidney injury, n (%)	3 (2.2%)	4 (2.9%)	4 (2.9%)	2 (1.3%)	0.414
In-hospital mortality, n (%)	0	0	0	0	–
Readmission within 30 days, n (%)	0 (0.0%)	0 (0.0%)	1 (0.7%)	5 (3.2%)	0.656
Prolonged hospital stay, n (%)	25 (18.4%)	18 (13.2%)	13 (9.6%)	14 (9.0%)	0.150
Postoperative length of stay, days	5.9±1.9	6.0±2.3	5.7±2.0	5.9±2.3	0.239
Total hospital care costs (yuan renminbi)	58,388.4±8,998.8	56,969.0±11,300.1	58,691.4±8,544.4	59,133.9±9,808.9	1.000

Results of binary logistics regression are presented as adjusted OR, 95% CI, and P value. The best-performing quartile 3 served as the reference group. OR, odds ratio.

**Table S8** Full-model multivariate results of the 4 groups treated with different total intravenous crystalloid infusions 24 hours postoperatively

Variables	Pneumonia			Pulmonary complications		
	OR	95% CI	P value	OR	95% CI	P value
ASA score			0.001			<0.001
I	1.000			1.000		
II	4.955	2.048–11.988	<0.001	5.930	2.483–14.163	<0.001
III	0.414	0.084–2.045	0.279	0.344	0.072–1.647	0.182
Diabetes mellitus						
No	1.000			1.000		
Yes	0.122	0.034–0.432	0.001	0.174	0.057–0.530	0.002
Length of operation						
<2 h	1.000			1.000		
2 h–	1.106	0.662–1.846	0.701	1.272	0.785–2.061	0.329
Infusion rate of intraoperative total fluids (quartile)			0.751			0.419
<9.3 mL/kg/h	1.000			1.000		
9.3–<11.6 mL/kg/h	0.747	0.398–1.404	0.365	0.654	0.364–1.175	0.156
11.6–<14.2 mL/kg/h	0.763	0.404–1.441	0.405	0.650	0.358–1.180	0.157
≥14.2 mL/kg/h	0.742	0.377–1.462	0.389	0.795	0.428–1.477	0.469
NSCLC staging			0.101			0.199
IA	1.000			1.000		
IB	0.084	0.011–0.659	0.018	0.299	0.095–0.940	0.039
IIA	1.272	0.470–3.443	0.636	1.060	0.400–2.808	0.907
IIB	6.079	0.345–107.022	0.217	5.469	0.309–96.751	0.246
IIIA	1.366	0.565–3.305	0.489	1.274	0.547–2.967	0.575
PEF%						
60%–	1.000			1.000		
<60%	1.278	0.806–2.029	0.297	1.159	0.750–1.789	0.506
Total intravenous crystalloid infusion in the postoperative 24 h (quartile)			<0.001			<0.001
<1,080 mL	1.716	0.812–3.628	0.157	2.007	1.036–3.889	0.039
1,080–<1,290 mL	1.566	0.741–3.312	0.240	1.331	0.667–2.654	0.417
1,290–<1,410 mL	1.000			1.000		
≥1,410 mL	3.702	1.908–7.186	<0.001	3.250	1.774–5.956	<0.001

Results of binary logistics regression are presented as adjusted OR, 95% CI, and P value. ASA, American Society of Anesthesiologists; NSCLC, non-small cell lung cancer; OR, odds ratio; PEF%, peak expiratory flow as a percentage of predicted.