Supplementary Online Content

Meltzer JA, Stone ME Jr, Reddy SH, Silver EJ. Association of whole body computed tomography with mortality risk in children with blunt trauma. *JAMA Pediatr*. Published online April 9, 2018. doi:10.1001/jamapediatrics.2018.0109

This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. List of Excluded Patients Due to Failure of Overlap Assumption in Propensity Score Model.

Patient Number	Model Excluded From	Type of CT	Died
5308	MVC Occupant Subgroup	Selective CT	No
27631	MVC Occupant Subgroup	Selective CT	No
27758	MVC Occupant Subgroup	Selective CT	No
31068	MVC Occupant Subgroup	Selective CT	No
5723	GCS < 9 Subgroup	WBCT	No
20362	Hypotension Subgroup	Selective CT	No
34906	Hypotension Subgroup	Selective CT	No
37077	Hypotension Subgroup	Selective CT	No

eTable 2. Covariate Standardized Differences and Variance Ratios, Before and After Propensity Weighting: Overall (N= 42,192).[a]

	Standardized Differences		Variance Ratio	
	Raw	Weighted	Raw	Weighted
Age, years	0.16	0.03	0.95	1.04
Sex				
Female	Reference	Reference	Reference	Reference
Male	-0.05	0.00	1.03	1.00
Missing	0.02	0.00	2.13	0.81
Race				
White	Reference	Reference	Reference	Reference
Black	-0.09	-0.02	0.84	0.96
Hispanic/Latino	0.02	-0.03	1.04	0.94
Other	0.02	0.00	1.07	0.99
Mechanism				
Other	Reference	Reference	Reference	Reference
Fall from Height	0.03	-0.01	1.17	0.97
Fall	-0.59	-0.03	0.38	0.96
Assault	-0.36	0.00	0.31	1.00
MVC Pedestrian	0.22	0.01	1.57	1.02
MVC Occupant	0.44	0.00	1.54	1.00
MVC Other	0.14	0.00	1.64	1.02
Payment				
Medicaid/Medicare	Reference	Reference	Reference	Reference
Private Insurance	-0.16	-0.01	0.93	1.00
Other	0.22	0.04	1.27	1.05
Glasgow Coma Scale				
≥9	Reference	Reference	Reference	Reference
<9	0.36	0.01	3.30	1.03
Missing	-0.04	0.00	0.80	1.01
Oxygen Saturation				
≥94%	Reference	Reference	Reference	Reference
<94%	0.21	0.02	2.30	1.10
Missing	-0.15	-0.05	0.65	0.87
Hypotension				
No	Reference	Reference	Reference	Reference
Yes	0.14	0.02	2.24	1.09
Missing	-0.17	-0.01	0.26	0.94
Assisted Respirations				
No	Reference	Reference	Reference	Reference
Yes	0.30	0.03	2.82	1.12
Missing	-0.15	-0.04	0.56	0.86
Chest Tube	0.21	-0.03	8.92	0.74
PRBC	0.18	-0.01	5.33	0.92
Plasma	0.12	0.00	6.04	0.94
Platelets	0.08	-0.01	7.77	0.83
Hospital Type				
Community	Reference	Reference	Reference	Reference
University	-0.18	0.03	0.96	1.00
Non-teaching	0.02	-0.02	1.05	0.95
Adult Trauma Center	0.59	0.05	0.50	0.96
Pediatric Trauma Center	-0.22	-0.04	1.01	1.01

	Standardized Differences		Variance Ratio	
	Raw	**Weighted**	**Raw**	**Weighted**
Region				
Midwest	Reference	Reference	Reference	Reference
Northeast	0.04	0.01	1.06	1.01
South	0.22	-0.03	1.16	0.98
West	-0.14	0.00	0.80	0.99
Missing	0.08	0.01	1.84	1.05
Number of Pediatric Beds				
0	Reference	Reference	Reference	Reference
1-10	0.12	0.00	1.37	1.00
11-15	-0.02	0.02	0.94	1.07
16-30	0.15	-0.01	1.28	0.98
31-80	0.17	0.06	1.29	1.09
>80	-0.31	-0.05	0.87	0.98
Missing	0.01	0.00	1.24	0.99
Interaction - Oxygen Saturation < 94%* Assisted Respirations				
≥94%*No	Reference	Reference	Reference	Reference
<94%*Yes	0.17	0.01	4.90	1.07
<94%*Missing	0.01	-0.02	1.23	0.62
Missing*Yes	0.06	0.00	2.18	1.04
Missing*Missing	-0.14	0.02	0.27	1.14
Interaction - Pediatric Trauma Center*Number of Pediatric Beds				
0	Reference	Reference	Reference	Reference
1-10	0.10	0.00	5.99	1.03
11-15	-0.04	0.00	0.19	0.88
16-30	0.08	-0.03	1.48	0.88
31-80	0.11	0.04	1.32	1.11
>80	-0.36	-0.06	0.78	0.97
Interaction - Pediatric Trauma Center*Adult Trauma Center	0.23	0.00	1.15	1.00
Interaction - PRBC*Chest Tube	0.09	-0.01	8.60	0.86

Abbreviations: WBCT, Whole Body Computed Tomography; MVC, Motor Vehicle Crash; PRBC, Packed Red Blood Cells.
[a] Raw Sample: # observations: 42,912 (8,757 WBCT; 34,155 Selective CT); Weighted Sample: # observations: 42,912.0 (20,991.9 WBCT; 21,920.1 Selective CT).

eTable 3. Covariate Standardized Differences and Variance Ratios, Before and After Propensity Weighting: MVC Pedestrian Subgroup (N= 5,291).[a]

	Standardized Differences		Variance Ratio	
	Raw	Weighted	Raw	Weighted
Age, years	0.05	-0.03	1.09	1.10
Sex				
Female	Reference	Reference	Reference	Reference
Male	0.05	0.00	0.97	1.00
Missing	-0.01	0.00	0.75	0.87
Race				
White	Reference	Reference	Reference	Reference
Black	-0.22	-0.02	0.80	0.98
Hispanic/Latino	0.05	0.01	1.08	1.01
Other	0.00	0.00	1.00	1.01
Payment				
Medicaid/Medicare	Reference	Reference	Reference	Reference
Private Insurance	-0.01	0.01	0.99	1.02
Other	0.08	0.05	1.05	1.03
Glasgow Coma Scale				
≥9	Reference	Reference	Reference	Reference
<9	0.35	0.01	2.78	1.02
Missing	0.10	0.02	1.96	1.12
Oxygen Saturation				
≥94%	Reference	Reference	Reference	Reference
<94%	0.21	0.02	2.04	1.06
Missing	-0.09	0.02	0.76	1.05
Hypotension				
No	Reference	Reference	Reference	Reference
Yes	0.14	-0.05	2.07	0.79
Missing	-0.01	0.01	0.94	1.12
Assisted Respirations				
No	Reference	Reference	Reference	Reference
Yes	0.27	-0.02	2.29	0.94
Missing	-0.24	-0.06	0.43	0.82
Chest Tube	0.21	-0.02	4.37	0.88
PRBC	0.18	0.01	3.57	1.04
Plasma	0.12	0.01	4.15	1.13
Platelets	0.09	0.00	5.40	0.98
Hospital Type				
Community	Reference	Reference	Reference	Reference
University	-0.38	-0.04	1.07	1.01
Non-teaching	0.14	0.01	1.53	1.04
Adult Trauma Center	0.58	0.02	0.52	0.98
Pediatric Trauma Center	-0.36	-0.04	1.12	1.01
Region				
Midwest	Reference	Reference	Reference	Reference
Northeast	0.07	0.00	1.08	1.00
South	0.16	-0.02	1.14	0.99
West	-0.08	0.03	0.87	1.05
Missing	0.13	0.00	2.66	1.03

	Standardized Differences		Variance Ratio	
	Raw	Weighted	Raw	Weighted
Number of Pediatric Beds				
0	Reference	Reference	Reference	Reference
1-10	0.18	0.02	1.75	1.08
11-15	0.09	0.01	1.45	1.05
16-30	0.11	-0.01	1.23	0.99
31-80	0.18	0.04	1.32	1.06
>80	-0.41	-0.05	0.92	0.99
Missing	0.02	0.00	1.70	1.04
Interaction - Oxygen Saturation < 94%* Assisted Respirations				
≥94%*No	Reference	Reference	Reference	Reference
<94%*Yes	0.14	-0.04	3.00	0.76
<94%*Missing	0.00	-0.03	0.95	0.67
Missing*Yes	0.05	0.00	1.62	1.03
Missing*Missing	-0.15	0.06	0.27	1.43
Interaction - Pediatric Trauma Center*Number of Pediatric Beds				
0	Reference	Reference	Reference	Reference
1-10	0.07	0.01	4.51	1.19
11-15	-0.01	0.00	0.75	1.07
16-30	0.03	-0.03	1.15	0.87
31-80	0.08	0.04	1.22	1.10
>80	-0.45	-0.05	0.84	0.99
Interaction - Pediatric Trauma Center*Adult Trauma Center	0.20	0.00	1.11	1.00
Interaction - PRBC*Chest Tube	0.11	0.02	4.08	1.29

Abbreviations: WBCT, Whole Body Computed Tomography; MVC, Motor Vehicle Crash; PRBC, Packed Red Blood Cells.
[a] Raw Sample: # observations: 5,291 (1,622 WBCT; 3,669 Selective CT); Weighted Sample: # observations: 5,291.0 (2,581.6 WBCT; 2,709.4 Selective CT).

eTable 4. Covariate Standardized Differences and Variance Ratios, Before and After Propensity Weighting: MVC Occupant Subgroup (N= 9,844).[a]

	Standardized Differences		Variance Ratio	
	Raw	Weighted	Raw	Weighted
Age, years	0.10	0.00	1.00	0.96
Sex				
Female	Reference	Reference	Reference	Reference
Male	0.02	0.00	1.00	1.00
Missing	0.01	0.00	1.93	1.02
Race				
White	Reference	Reference	Reference	Reference
Black	-0.16	-0.03	0.75	0.95
Hispanic/Latino	0.00	0.00	1.01	1.00
Other	0.10	0.01	1.29	1.01
Payment				
Medicaid/Medicare	Reference	Reference	Reference	Reference
Private Insurance	0.00	0.03	1.00	1.03
Other	0.04	0.02	1.02	1.01
Glasgow Coma Scale				
≥9	Reference	Reference	Reference	Reference
<9	0.32	-0.03	2.49	0.93
Missing	0.05	0.01	1.34	1.09
Oxygen Saturation				
≥94%	Reference	Reference	Reference	Reference
<94%	0.17	0.01	1.85	1.02
Missing	-0.06	-0.01	0.83	0.96
Hypotension				
No	Reference	Reference	Reference	Reference
Yes	0.11	-0.01	1.71	0.97
Missing	-0.02	0.02	0.78	1.25
Assisted Respirations				
No	Reference	Reference	Reference	Reference
Yes	0.28	0.00	2.29	0.99
Missing	-0.10	-0.01	0.65	0.97
Chest Tube	0.18	-0.04	5.44	0.76
PRBC	0.16	-0.02	3.19	0.88
Plasma	0.10	0.00	3.33	1.00
Platelets	0.07	-0.01	4.41	0.77
Hospital Type				
Community	Reference	Reference	Reference	Reference
University	-0.33	0.00	1.01	1.00
Non-teaching	0.13	0.00	1.39	1.01
Adult Trauma Center	0.54	0.00	0.52	1.00
Pediatric Trauma Center	-0.31	-0.01	1.09	1.00
Region				
Midwest	Reference	Reference	Reference	Reference
Northeast	0.04	0.00	1.09	1.00
South	0.17	-0.02	1.05	0.99
West	-0.15	-0.02	0.78	0.97
Missing	0.09	0.00	2.00	0.96

	Standardized Differences		Variance Ratio	
	Raw	**Weighted**	**Raw**	**Weighted**
Number of Pediatric Beds				
0	Reference	Reference	Reference	Reference
1-10	0.12	0.00	1.50	1.01
11-15	0.05	0.00	1.23	1.02
16-30	0.24	0.00	1.55	1.00
31-80	0.16	0.02	1.28	1.04
>80	-0.40	-0.03	0.93	1.00
Missing	0.04	0.00	1.93	1.00
Interaction - Oxygen Saturation < 94%* Assisted Respirations				
≥94%*No	Reference	Reference	Reference	Reference
<94%*Yes	0.14	0.01	2.70	1.04
<94%*Missing	0.01	-0.01	1.23	0.84
Missing*Yes	0.07	-0.01	2.27	0.92
Missing*Missing	-0.12	0.05	0.27	1.47
Interaction - Pediatric Trauma Center*Number of Pediatric Beds				
0	Reference	Reference	Reference	Reference
1-10	0.08	0.00	4.49	1.00
11-15[b]	-	-	-	-
16-30	0.14	0.00	1.97	0.99
31-80	0.09	0.03	1.22	1.07
>80	-0.45	-0.02	0.82	0.99
Interaction - Pediatric Trauma Center*Adult Trauma Center	0.20	0.00	1.09	1.00
Interaction - PRBC*Chest Tube	0.09	-0.04	5.77	0.56

Abbreviations: WBCT, Whole Body Computed Tomography; MVC, Motor Vehicle Crash; PRBC, Packed Red Blood Cells.
[a] Raw Sample: # observations: 9,844 (3,355 WBCT; 6,489 Selective CT); Weighted Sample: # observations: 9,844.0 (4,875.7 WBCT; 4,968.3 Selective CT).
[b] No observations for this category in this sample.

eTable 5. Covariate Standardized Differences and Variance Ratios, Before and After Propensity Weighting: Glasgow Coma Scale < 9 Subgroup (N= 2,427).[a]

	Standardized Differences		Variance Ratio	
	Raw	Weighted	Raw	Weighted
Age, years	0.23	0.00	0.85	0.96
Sex				
Female	Reference	Reference	Reference	Reference
Male	-0.07	-0.02	1.04	1.01
Missing[b]	-	-	-	-
Race				
White	Reference	Reference	Reference	Reference
Black	-0.18	0.02	0.75	1.03
Hispanic/Latino	0.00	-0.02	0.99	0.96
Other	0.02	0.01	1.06	1.02
Mechanism				
Other	Reference	Reference	Reference	Reference
Fall from Height	0.02	-0.01	1.09	0.93
Fall	-0.48	0.05	0.36	1.09
Assault	-0.31	0.01	0.34	1.04
MVC Pedestrian	0.17	-0.02	1.35	0.98
MVC Occupant	0.30	-0.02	1.22	0.99
MVC Other	0.11	0.00	1.44	0.99
Payment				
Medicaid/Medicare	Reference	Reference	Reference	Reference
Private Insurance	-0.05	-0.01	0.97	1.00
Other	0.14	0.00	1.16	1.00
Oxygen Saturation				
≥94%	Reference	Reference	Reference	Reference
<94%	0.19	-0.01	1.29	0.99
Missing	-0.06	0.00	0.84	0.99
Hypotension				
No	Reference	Reference	Reference	Reference
Yes	0.10	-0.01	1.32	0.97
Missing	-0.11	-0.04	0.34	0.69
Assisted Respirations				
No	Reference	Reference	Reference	Reference
Yes	0.23	-0.02	1.00	1.00
Missing	-0.06	0.02	0.77	1.07
Chest Tube	0.20	-0.05	2.15	0.84
PRBC	0.14	0.00	1.47	1.00
Plasma	0.10	-0.01	1.57	0.94
Platelets	0.11	-0.02	2.25	0.87
Hospital Type				
Community	Reference	Reference	Reference	Reference
University	-0.26	0.05	1.07	0.99
Non-teaching	0.14	-0.05	1.47	0.88
Adult Trauma Center	0.55	-0.01	0.54	1.01
Pediatric Trauma Center	-0.22	0.02	1.11	0.99

	Standardized Differences		Variance Ratio	
	Raw	Weighted	Raw	Weighted
Region				
Midwest	Reference	Reference	Reference	Reference
Northeast	-0.02	-0.02	0.97	0.96
South	0.11	-0.01	1.06	0.99
West	-0.06	0.02	0.92	1.03
Missing	0.12	-0.01	2.39	0.93
Number of Pediatric Beds				
0	Reference	Reference	Reference	Reference
1-10	0.11	0.01	1.43	1.03
11-15	0.05	-0.02	1.26	0.89
16-30	0.21	-0.03	1.54	0.95
31-80	-0.01	0.04	0.98	1.06
>80	-0.24	-0.01	0.98	1.00
Missing	0.02	0.01	1.33	1.25
Interaction - Oxygen Saturation < 94%* Assisted Respirations				
≥94%*No	Reference	Reference	Reference	Reference
<94%*Yes	0.17	-0.01	1.43	0.99
<94%*Missing	0.00	-0.01	0.98	0.88
Missing*Yes	0.06	-0.01	1.37	0.94
Missing*Missing	-0.05	0.02	0.63	1.23
Interaction - Pediatric Trauma Center*Number of Pediatric Beds				
0	Reference	Reference	Reference	Reference
1-10	0.03	0.00	1.77	0.96
11-15[b]	-	-	-	-
16-30	0.22	-0.03	2.70	0.90
31-80	-0.04	0.05	0.92	1.11
>80	-0.32	-0.01	0.91	1.00
Interaction - Pediatric Trauma Center*Adult Trauma Center	0.26	0.00	1.12	1.00
Interaction - PRBC*Chest Tube	0.12	-0.03	2.46	0.81

Abbreviations: WBCT, Whole Body Computed Tomography; MVC, Motor Vehicle Crash; PRBC, Packed Red Blood Cells.
[a] Raw Sample: # observations: 2,427 (1,176 WBCT; 1,251 Selective CT); Weighted Sample: # observations: 2,427.0 (1,214.9 WBCT; 1,212.1 Selective CT).
[b] No observations for this category in this sample.

eTable 6. Covariate Standardized Differences and Variance Ratios, Before and After Propensity Weighting: Hypotension Subgroup (N= 1,056).[a]

	Standardized Differences		Variance Ratio	
	Raw	Weighted	Raw	Weighted
Age, years	0.16	0.02	0.95	1.06
Sex				
Female	Reference	Reference	Reference	Reference
Male	-0.13	0.02	1.04	0.99
Missing[b]	-	-	-	-
Race				
White	Reference	Reference	Reference	Reference
Black	-0.14	0.02	0.79	1.04
Hispanic/Latino	0.07	-0.03	1.15	0.93
Other	0.00	0.00	1.01	1.01
Mechanism				
Other	Reference	Reference	Reference	Reference
Fall from Height	-0.01	0.02	0.93	1.14
Fall	-0.54	-0.03	0.27	0.95
Assault	-0.25	0.13	0.42	1.41
MVC Pedestrian	0.21	-0.06	1.46	0.90
MVC Occupant	0.31	-0.01	1.21	0.99
MVC Other	0.13	0.03	1.54	1.11
Payment				
Medicaid/Medicare	Reference	Reference	Reference	Reference
Private Insurance	-0.15	-0.03	0.93	0.98
Other	0.16	0.02	1.15	1.02
Glasgow Coma Scale				
≥9	Reference	Reference	Reference	Reference
<9	0.43	-0.02	1.70	0.97
Missing	-0.02	0.11	0.89	1.68
Oxygen Saturation				
≥94%	Reference	Reference	Reference	Reference
<94%	0.48	0.00	2.32	1.00
Missing	-0.17	0.05	0.56	1.16
Assisted Respirations				
No	Reference	Reference	Reference	Reference
Yes	0.43	0.10	1.80	1.13
Missing	-0.25	-0.02	0.38	0.93
Chest Tube	0.36	-0.03	4.62	0.90
PRBC	0.41	-0.01	2.87	0.98
Plasma	0.30	0.00	3.93	1.01
Platelets	0.22	0.03	4.41	1.23
Hospital Type				
Community	Reference	Reference	Reference	Reference
University	-0.19	0.06	1.03	0.98
Non-teaching	0.05	-0.05	1.16	0.85
Adult Trauma Center	0.48	-0.03	0.64	1.02
Pediatric Trauma Center	-0.20	0.05	1.07	0.98

	Standardized Differences		Variance Ratio	
	Raw	Weighted	Raw	Weighted
Region				
Midwest	Reference	Reference	Reference	Reference
Northeast	-0.01	0.06	0.98	1.12
South	0.29	-0.03	1.18	0.98
West	-0.15	0.06	0.81	1.08
Missing	0.13	-0.01	3.33	0.90
Number of Pediatric Beds				
0	Reference	Reference	Reference	Reference
1-10	0.00	-0.03	1.01	0.91
11-15	-0.06	-0.03	0.78	0.89
16-30	0.22	0.02	1.56	1.04
31-80	0.13	-0.02	1.22	0.97
>80	-0.27	0.03	0.98	1.00
Missing	-0.03	-0.03	0.56	0.62
Interaction - Oxygen Saturation < 94%* Assisted Respirations				
≥94%*No	Reference	Reference	Reference	Reference
<94%*Yes	0.34	0.00	3.12	1.00
<94%*Missing	0.04	-0.02	1.68	0.77
Missing*Yes	0.00	-0.01	1.01	0.90
Missing*Missing	-0.20	0.09	0.10	1.81
Interaction - Pediatric Trauma Center*Number of Pediatric Beds				
0	Reference	Reference	Reference	Reference
1-10[b]	-	-	-	-
11-15[b]	-	-	-	-
16-30	0.09	0.01	1.57	1.07
31-80	0.09	0.00	1.27	1.00
>80	-0.30	0.05	0.91	1.01
Interaction - Pediatric Trauma Center*Adult Trauma Center	0.23	0.02	1.14	1.01
Interaction - PRBC*Chest Tube	0.21	0.01	5.73	1.11

Abbreviations: WBCT, Whole Body Computed Tomography; MVC, Motor Vehicle Crash; PRBC, Packed Red Blood Cells.
[a] Raw Sample: # observations: 1,056 (393 WBCT; 663 Selective CT); Weighted Sample: # observations: 1,056.0 (523.9 WBCT; 532.1 Selective CT).
[b] No observations for this category in this sample.

eTable 7. Covariate Standardized Differences and Variance Ratios, Before and After Propensity Weighting: ICU Admission Subgroup (N= 11,106).[a]

	Standardized Differences		Variance Ratio	
	Raw	Weighted	Raw	Weighted
Age, years	0.21	0.02	0.94	1.03
Sex				
Female	Reference	Reference	Reference	Reference
Male	-0.05	-0.02	1.03	1.01
Missing	-0.01	0.01	0.51	1.41
Race				
White	Reference	Reference	Reference	Reference
Black	-0.13	-0.02	0.79	0.96
Hispanic/Latino	-0.01	-0.04	0.98	0.93
Other	0.04	0.01	1.12	1.02
Mechanism				
Other	Reference	Reference	Reference	Reference
Fall from Height	-0.05	-0.01	0.81	0.97
Fall	-0.52	-0.01	0.37	0.98
Assault	-0.32	0.03	0.32	1.07
MVC Pedestrian	0.14	0.00	1.29	1.01
MVC Occupant	0.41	-0.02	1.39	0.98
MVC Other	0.11	0.01	1.46	1.03
Payment				
Medicaid/Medicare	Reference	Reference	Reference	Reference
Private Insurance	-0.11	0.03	0.95	1.01
Other	0.14	0.00	1.18	1.00
Glasgow Coma Scale				
≥9	Reference	Reference	Reference	Reference
<9	0.32	0.02	1.68	1.03
Missing	0.02	0.02	1.11	1.11
Oxygen Saturation				
≥94%	Reference	Reference	Reference	Reference
<94%	0.20	0.01	1.69	1.02
Missing	-0.07	0.01	0.79	1.02
Hypotension				
No	Reference	Reference	Reference	Reference
Yes	0.15	0.03	1.85	1.11
Missing	-0.13	-0.03	0.29	0.81
Assisted Respirations				
No	Reference	Reference	Reference	Reference
Yes	0.31	0.04	1.75	1.07
Missing	-0.22	-0.05	0.37	0.83
Chest Tube	0.23	-0.04	4.82	0.79
PRBC	0.18	0.00	2.65	0.98
Plasma	0.14	-0.01	3.49	0.90
Platelets	0.10	-0.02	5.31	0.72
Hospital Type				
Community	Reference	Reference	Reference	Reference
University	-0.21	0.02	1.07	0.99
Non-teaching	0.07	-0.01	1.24	0.96
Adult Trauma Center	0.58	0.02	0.44	0.97
Pediatric Trauma Center	-0.27	-0.02	1.22	1.02

	Standardized Differences		Variance Ratio	
	Raw	Weighted	Raw	Weighted
Region				
Midwest	Reference	Reference	Reference	Reference
Northeast	-0.02	0.01	0.96	1.01
South	0.27	0.02	1.17	1.01
West	-0.18	-0.03	0.77	0.96
Missing	0.16	0.01	4.53	1.11
Number of Pediatric Beds				
0	Reference	Reference	Reference	Reference
1-10	0.06	0.00	1.34	0.98
11-15	0.04	-0.01	1.23	0.93
16-30	0.17	-0.02	1.40	0.96
31-80	0.11	0.05	1.14	1.05
>80	-0.27	-0.03	1.00	1.00
Missing	0.07	0.01	7.14	1.43
Interaction - Oxygen Saturation < 94%* Assisted Respirations				
≥94%*No	Reference	Reference	Reference	Reference
<94%*Yes	0.18	0.02	2.61	1.10
<94%*Missing	-0.06	-0.05	0.41	0.47
Missing*Yes	0.05	0.01	1.59	1.10
Missing*Missing	-0.09	0.05	0.38	1.46
Interaction - Pediatric Trauma Center*Number of Pediatric Beds				
0	Reference	Reference	Reference	Reference
1-10	0.03	0.01	6.13	1.63
11-15	-0.06	-0.03	0.19	0.46
16-30	0.04	-0.03	1.13	0.90
31-80	0.07	0.03	1.15	1.06
>80	-0.32	-0.03	0.92	0.99
Interaction - Pediatric Trauma Center*Adult Trauma Center	0.24	0.00	1.02	1.00
Interaction - PRBC*Chest Tube	0.10	-0.03	4.69	0.67
Abbreviations: WBCT, Whole Body Computed Tomography; MVC, Motor Vehicle Crash; PRBC, Packed Red Blood Cells. [a] Raw Sample: # observations: 11,106 (3,646 WBCT; 7,460 Selective CT); Weighted Sample: # observations: 11,106.0 (5,475.6 WBCT; 5,630.4 Selective CT).				

eTable 8. Propensity Score Weighted Mortality Risk for Children Who Received WBCT vs Selective CT: Additionally Adjusted for Injury Severity Score (ISS).[a]

	N	WBCT n (%)	Selective CT n (%)	Absolute Risk Difference, % (95% CI)	Relative Risk, (95% CI)
Unadjusted Sample	42,912	228 (2.6)	177 (0.5)	2.1 (1.7, 2.4)	5.0 (4.1, 6.1)
Adjusted Samples					
Overall	42,912	215 (1.0)	267 (1.2)	-0.2 (-0.5, 0.1)	0.9 (0.7, 1.1)
Mechanism					
MVC pedestrian	5,291	50 (1.9)	69 (2.5)	-0.6 (-1.4, 0.2)	0.8 (0.5, 1.1)
MVC occupant	9,844	95 (2.0)	88 (1.8)	0.2 (-0.4, 0.8)	1.1 (0.8, 1.6)
GCS < 9	2,427	168 (13.9)	190 (15.7)	-1.8 (-4.8, 1.2)	0.9 (0.7, 1.1)
Hypotension	1,056	53 (10.7)	63 (11.3)	-0.7 (-5.0, 3.6)	0.9 (0.6, 1.4)
Admitted to ICU	11,106	177 (3.2)	209 (3.7)	-0.5 (-1.4, 0.4)	0.9 (0.7, 1.1)

Abbreviations: WBCT, Whole Body Computed Tomography; CI, Confidence Interval; MVC, Motor Vehicle Crash; GCS, Glasgow Coma Scale; ICU, Intensive Care Unit; ISS, Injury Severity Score.
[a]Adjusted for original covariates/interactions and additionally adjusted for ISS as well as its interaction with mechanism, GCS, assisted respirations, hypotension, and PRBC transfusion.

eTable 9. Propensity Score Weighted Mortality Risk for Children Who Received WBCT vs Selective CT: Excluding Children with Isolated Head Injury.[a]

	N	WBCT n (%)	Selective CT n (%)	Absolute Risk Difference, % (95% CI)	Relative Risk, (95% CI)
Unadjusted Sample	31,130	222 (2.8)	159 (0.7)	2.1 (1.8, 2.5)	4.1 (3.4, 5.0)
Adjusted Samples					
Overall	31,130	204 (1.3)	267 (1.7)	-0.4 (-0.8, 0.1)	0.8 (0.6, 1.1)
Mechanism					
MVC pedestrian	4,798	55 (2.3)	82 (3.3)	-1.0 (-2.3, 0.4)	0.7 (0.5, 1.1)
MVC occupant	8,817	95 (2.2)	78 (1.7)	0.4 (-0.4, 1.3)	1.3 (0.8, 1.9)
GCS < 9	1,921	172 (18.1)	170 (17.5)	0.6 (-3.5, 4.7)	1.0 (0.8, 1.3)
Hypotension	858	59 (14.0)	55 (12.7)	1.3 (-3.5, 6.1)	1.1 (0.8, 1.6)
Admitted to ICU	8,619	169 (4.0)	193 (4.4)	-0.5 (-1.6, 0.7)	0.9 (0.7, 1.2)

Abbreviations: WBCT, Whole Body Computed Tomography; CI, Confidence Interval; MVC, Motor Vehicle Crash; GCS, Glasgow Coma Scale; ICU, Intensive Care Unit; ISS, Injury Severity Score.
[a.] Excludes 11,782 (27.5%) of overall sample.

eTable 10. Endogeneity Tests for Presence of Residual Confounding in the Overall and Subgroup Treatment Effects Models.

	N	Test for Endogeneity P
Overall	42,192	0.63
Subgroup		
Mechanism		
MVC pedestrian	5,291	0.46
MVC occupant	9,844	0.77
GCS < 9	2,427	0.89
Hypotension	1,056	0.57
Admitted to ICU	11,106	0.91
Abbreviations: MVC, Motor Vehicle Crash; GCS, Glasgow Coma Scale; ICU, Intensive Care Unit.		

eAppendix. Expanded Notes on Methods

Data Source and Design

The NTDB compiles data annually from over 700 facilities across the US and Canada. The NTDB dataset includes only injured patients who were admitted to the hospital, died after evaluation in the emergency department (ED), or were dead on arrival to the ED. Participating hospitals submit their data using a standardized methodology and the data is then cleaned and validated before being released.[1]

Study Patients

Children between the ages of 6 months and 14 years with a history of sustaining blunt trauma were eligible for analysis. We chose to study this particular age group for several reasons. First, we did not want to include infants who may have multiple comorbidities from birth or prematurity, or who were inadvertently included in the database due to birth trauma. In addition, the American College of Surgeons, the credentialing body for most US trauma centers, uses <15 years as its age cutoff when considering the hospital's volume count of pediatric patients for trauma designation.[2] Furthermore, we chose to study only blunt trauma patients as penetrating trauma often results in local injury and rarely necessitates a WBCT. Patients who sustained both blunt and penetrating trauma, however, were included.

Procedures

International Classification of Diseases, 9th Revision, (ICD-9) procedure codes were used to identify patients who received the following procedures: CT Head, 87.03, 87.04; CT Chest, 87.41, 87.42; CT Abdomen/Pelvis, 88.01, 88.02; CT Other, 88.38; CT kidney, 87.71; Packed Red Blood Cells [PRBC] transfusion, 99.04; Plasma transfusion, 99.07; Platelet transfusion, 99.05; Chest tube thoracostomy, 34.04.

Covariate Definitions

The mechanism of injury was ascertained using E-codes supplied by the NTDB. We dichotomized the covariate GCS at 9, a clinically important cut-point, because it did not satisfy the logistic regression model assumption of linearity. Hypoxia was defined as an initial oxygen saturation < 94% recorded by Emergency Medical Services (EMS) or in the ED. Patients were categorized as having hypotension if they had an initial systolic blood pressure measured by EMS or ED providers that was below 90 mmHg for children ≥ 10 years-old, or 70mmHg + (2*age in years) for children < 10 years-old.[3,4] In addition, patients were classified as receiving PRBC, plasma, platelets, or a chest tube thoracostomy, if it was received within two hours of ED arrival. If an intervention was received after two hours of arrival, it was not counted as a "positive" so as not to include procedures that were performed after WBCT and thus potentially influenced by its results.

A facility was classified as a trauma center if it was noted to be either a state or American College of Surgeons designated Level I or Level II trauma center. In addition, we used the assisted respirations status, hospital region, and pediatric beds categories as provided by the NTDB.

Sensitivity Analyses

In our first sensitivity analysis, we examined the effect of adding the Injury Severity Score (ISS) to our propensity models. Several authors have advised against adjusting for the Injury Severity Score (ISS) when examining the association of mortality and WBCT.[5,6] The ISS is calculated from injury diagnosis codes after-the-fact and is not readily available to the clinician while caring for the injured patient. Because the score itself can be affected by the WBCT exposure status, adjusting for it could result in a differential misclassification bias. In other words, two identically injured patients may have vastly different ISS solely due to whether or not they received a WBCT which may identify more, not necessarily lethal, injuries and thus increase the score. In our primary analysis, we therefore chose not adjust for ISS but rather adjusted for several other covariates that could act as surrogates for injury severity but would be realized prior to the intervention and thus not affected by it. In this sensitivity analysis, we

examined whether additionally adjusting for ISS would substantively affect our results. To accomplish this, we included ISS in our propensity model along with its clinically plausible interactions with mechanism, GCS <9, need for assisted respirations, hypotension, and PRBC transfusion. All interactions were first examined individually as product terms in the propensity model, found to be statistically significant (p<0.01), and thus remained in the model.

In our second sensitivity analysis, we evaluated the association of WBCT and mortality in children excluding those with isolated head injury. Head injury is the leading cause of death from blunt trauma and when occurring in isolation rarely necessitates WBCT.[7] We identified patients as having isolated head injuries if they had only Abbreviated Injury Scale (AIS) codes for the region of the head (100000 through 199999) but no AIS codes for any other region.

In our third sensitivity analysis, we sought to examine statistically whether there were any important confounding variables that were unaccounted for in the propensity model. One assumption of propensity scores models and treatment effect estimators is the lack of residual or "unmeasured" confounding. To examine for this type of endogeneity,[8] we employed a different procedure to estimate the treatment effect. Using the "control-function" approach incorporated into STATA's *endogenous* treatment effects commands, the residuals from a probit regression model with treatment (WBCT) as the dependent variable were included in a probit regression model with the outcome (death) as the dependent variable.[9] Both models included all aforementioned covariates; significant interaction terms were included in the treatment model only. We then performed a post-estimation test of endogeneity to examine for the presence of significant correlation between the two models which would indicate the presence of significant residual confounding. When endogeneity is present, the control-function approach will yield more accurate results by adjusting for the effect of these unmeasured confounders. When there is no endogeneity, however, it is preferable to use inverse probability weighting to estimate the treatment effect because this method will provide more valid standard errors.

eReferences.

1. National Trauma Data Bank. *National Trauma Data Bank User Manual: Admission Years 2002-2014.* Chicago, IL: Committee on Trauma, American College of Surgeons; 2015.
2. Rotondo M, Cribari C, Smith R, eds. *Resources for the Optimal Care of the Injured Patient.* 6th ed. Chicago, IL: American College of Surgeons; 2014.
3. Committee on Trauma - American College of Surgeons. *Advanced Trauma Life Support (ATLS)® Student Course Manual. Ninth Edition.* Chicago, IL.: American College of Surgeons; 2012.
4. *Pediatric Advanced Life Support: Provider Manual.* Dallas, TX: American Heart Association; 2016.
5. Yeguiayan JM, Yap A, Freysz M, et al. Impact of whole-body computed tomography on mortality and surgical management of severe blunt trauma. *Crit Care.* Jun 11 2012;16(3):R101.
6. Stengel D, Frank M, Matthes G, et al. Primary pan-computed tomography for blunt multiple trauma: can the whole be better than its parts? *Injury.* Nov 2009;40 Suppl 4:S36-46.
7. Sathya C, Alali AS, Wales PW, et al. Mortality Among Injured Children Treated at Different Trauma Center Types. *JAMA Surg.* Sep 2015;150(9):874-881.
8. Gunasekara FI, Carter K, Blakely T. Glossary for econometrics and epidemiology. *J Epidemiol Community Health.* Oct 2008;62(10):858-861.
9. Terza JV, Basu A, Rathouz PJ. Two-stage residual inclusion estimation: addressing endogeneity in health econometric modeling. *J Health Econ.* May 2008;27(3):531-543.