Key probabilities used in the decision analysis model (based on PECARN data; N = 12,044) **Probability**	**n (%)**
IAI*	
Patients with IAI	203/12,044 (1.7)
Patients with IAI who died from IAI	9/203 (4.4)
Patients with IAI who required therapeutic laparotomy or angiography	125/203 (61.6)
Patients with IAI who required a blood transfusion or IV fluids ≥2 nights for pancreas / gastrointestinal injuries	201/203 (99.0)
Usual Care Strategy	
Patients who were discharged from the ED	5991/12,044 (49.7)
Patients who were admitted to the hospital	6053/12,044 (50.3)
Patients with an initial abdominal CT	5380/12,044 (44.7)
Patients without an initial abdominal CT	6664/12,044 (55.3)
Patients without an initial abdominal CT and sent directly for laparotomy	11/6,664 (0.2)
Patients with an IAI who had an initial abdominal CT (sensitivity)†	191/192 (99.5)
Patients without an IAI who did not have an initial abdominal CT (specificity)	6652/11,841 (56.2)
Patients with an initial abdominal CT who had an IAI ‡	191/5380 (3.6)
Patients without an initial abdominal CT who had an IAI (missed IAI) ‡	1/6,653 (0.02)
Patients with an initial abdominal CT who were discharged home	1697/5,380 (31.5)
Patients with an initial abdominal CT who were admitted to the hospital	3683/5,380 (68.5)
Patients without an initial abdominal CT who were discharged home‡	4294/6,653 (64.5)
Patients without an initial abdominal CT who were admitted to the hospital‡	2359/6,653 (35.5)
Patients without an initial abdominal CT, discharged home, and had an IAI (missed IAI)	¼,294 (0.02)
Patients without initial abdominal CT, admitted to hospital, and had an IAI (missed IAI)	0/2,370 (0)
Patients with a missed IAI who required therapeutic laparotomy or angiography	1/1 (100)
TOTAL MISSED IAI WITH USUAL CARE STRATEGY	1/12,044 (0.0)
Clinical Decision Rule Strategy	
Patients with at least one CDR variable present (CDR+)§	7,010/12,044 (58.2)
Patients with no CDR variables present (CDR-)	5,034/12,044 (41.8)
Patients CDR+ with an initial abdominal CT	4,126/7,010 (58.9)
Patients CDR+ without an initial abdominal CT	2,884/7,010 (41.1)
Patients CDR+ without an initial abdominal CT and sent directly for laparotomy	11/2,884 (0.4)
Patients CDR+ with an initial abdominal CT and with IAI ‡	192/4,126 (4.7)
Patients CDR+ without an initial abdominal CT and with IAI (missed IAI)‡	1/2,873 (0.03)
Patients CDR+ without an initial abdominal CT and discharged home‡	1,867/2,873 (65.0)
Patients CDR+ without an initial abdominal CT and admitted to the hospital‡	1,006/2,873 (35.0)
Patients CDR+ without an initial abdominal CT, discharged home, and had an IAI (missed IAI)	1/1,867 (0.05)
Patients CDR+ without an initial abdominal CT, admitted to hospital, and with an IAI (missed IAI)‡	0/1,006(0)
Patients CDR+ and with a missed IAI who received therapeutic laparotomy or angiography	1/1 (100)
Patients CDR- with an initial abdominal CT	0/5,034 (0)
Patients CDR- without an initial abdominal CT	5,034/5,034 (100)
Patients CDR- without an initial abdominal CT and who had an IAI (missed IAI)	6/5,034 (0.1)
Patients CDR- without an initial abdominal CT and who were discharged home	2,939/5,034 (58.4)
Patients CDR- without an initial abdominal CT and who were admitted to the hospital	2,095/5,034 (41.6)
Patients CDR- without an initial abdominal CT, discharged home, and with an IAI (missed IAI)	0/2,939 (0)
Patients CDR- without an initial abdominal CT, admitted to hospital, and with an IAI (missed IAI)	6/2,095 (0.3)
Patients CDR- and with a missed IAI who received therapeutic laparotomy or angiography	4/6 (66.7)
Patients with an IAI who were CDR+ (sensitivity)	197/203 (97.0)
Patients without an IAI who were CDR- (specificity)	5,028/11,841 (42.5)
TOTAL MISSED IAI WITH CLINICAL DECISION RULE STRATEGY	7/12,044 (0.06)

IAI = intra-abdominal injury requiring acute intervention; CDR+ = presence of one or more high risk variable identified in the PECARN clinical decision rule; CDR- = no high risk variable identified in the PECARN clinical decision rule

* 103 patients received more than one intervention

† Sensitivity of usual care is based on initial ED CT ordering and excludes 11 patients with IAI who received laparotomy without CT imaging

‡ Excludes 11 patients with IAI who received laparotomy without CT imaging

§ Probabilities for CDR+ followed usual care strategy

Key micro-costs* and probabilities		
Resource	Cost or probability	Key
Diagnostic		
Comprehensive metabolic panel (CMP; includes liver function tests)	12	cCMP
Complete blood count (CBC)	10	cCBC
Total cost for blood work per day (CMP + CBC)	22	cTotal_Bloodwork
Focused assessment of sonography for trauma (FAST)	161	cFAST
Chest radiograph (CXR)	66	cCXR
Pelvis radiograph (PXR)	67	cPXR
Extremity radiography (EXR)	66	cEXR
Computed tomography (CT), abdomen and pelvis with contrast	418	cCT
Sedation for abdominal CT	51	cSedation
Probability of sedation for abdominal CT	0.033	pSedation
Total costs for abdominal CT†	420	cTotalCT
Treatment		
Intravenous antiemetic medication (per day)	49	cIVantiemetic
Intravenous fluids (per day)	3	cIVfluids
Intravenous pain medication (per day)	10	cIVpainmeds
Total cost for intravenous treatment per day (anti-emetics + fluids + pain management)	62	cTotal_IVmeds
Transfusion of packed red blood cells (per unit)	711	cRBC
Transfusion of fresh frozen plasma (per unit)	1122	cFFP
Angiography for embolization	1000	cAngiography
Probability for angiography	0.09	pAngiography
Laparotomy procedure	800	cLaparotomy
Intubation procedure	6	cETT
Mechanical ventilation (per day)	463	cMechVent
Total cost of mechanical ventilation‡	839	cTotal_MechVent
Probability for therapeutic laparotomy	0.91	pLaparotomy
Pre-operating room	359	cPACU
Operating room (1st hour)	801	cOR1sthr
Operating room (each additional hour)	500	cORaddhr
Total cost of therapeutic laparotomy§	2835	cTotal_Laparotomy
Boarding		
Trauma service activation	1396	cTraumaActivation
Level 5 ED visit	593	cLevel5EDvisit
Boarding cost on the floor (per day)	1074	cFloor
Boarding cost in the intensive care unit (per day)	2484	cICU

* Estimated 2011 hospital costs derived from single center data

† Total cost of abdominal CT = CT abdomen and pelvis with contrast + (sedation * probability of sedation)

‡ Total cost of mechanical ventilation = intubation + (mechanical ventilation * 1.8 days)

§ Total cost of therapeutic laparotomy = laparotomy procedure + pre-operating room + operating room, 1st hour + (operating room, additional hour * 1.75)

Cost summaries for end nodes†			
End node	Diagnostic Cost Summation	Therapeutic Cost Summation	Boarding Cost Summation
Patient with IAI requiring therapeutic laparotomy or angiography	(cTotal_Bloodwork * days in hospital) + cFAST + cCXR + cPXR + cEXR +cTotal_CT	(cTotal_IVmeds * days in hospital) + (cRBC * units of RBCs) + (cFFP * units of FFP) + (cTotal_Laparotomy * pLaparotomy) + (cAngiography * pAngiography) + cTotal_MechVent	cTraumaActivation + cLevel5EDvisit + (cICU * days) + (cFloor * days)
Patient with IAI requiring a blood transfusion or IV fluids for 2 or more nights	(cTotal_Bloodwork * days in hospital) + cCXR + cPXR + cEXR +cTotal_CT	(cTotal_IVmeds * days in hospital) + (cRBC * units) + (cFFP * units)	cTraumaActivation + cLevel5EDvisit + (cICU * days) + (cFloor * days)
Patient with no IAI, receiving an abdominal CT scan, and admitted to hospital	(cTotal_Bloodwork * days in hospital) + cCXR + cPXR + cEXR +cTotal_CT	cTotal_IVmeds * days in hospital	cLevel5EDvisit + (cICU * days) + (cFloor * days)
Patient with no IAI , receiving an abdominal CT scan, and discharged home	cTotal_Bloodwork + cCXR + cPXR + cEXR +cTotal_CT	None	cLevel5EDvisit
Patient with no IAI, not receiving an abdominal CT scan, and admitted to hospital	(cTotal_Bloodwork * days in hospital) + cCXR	cTotal_IVmeds * days in hospital	cLevel5EDvisit + (cICU * days) + (cFloor * days)
Patient with no IAI, not receiving an abdominal CT scan, and discharged home	(cTotal_Bloodwork * days in hospital) + cCXR	None	cLevel5EDvisit
Patient with a missed IAI	(cTotal_Bloodwork * days in hospital) + cCXR + cPXR + cEXR +cTotal_CT	cTotal_IVmeds * days in hospital) + (cRBC * units) + (cFFP * units)	cLevel5EDvisit + (cICU * days) + (cFloor * days)

IAI = intra-abdominal injury requiring acute intervention

†See Data Supplement 2 for individual micro-costs

Units per end node				
End node	Days admitted to the intensive care unit	Days admitted to the hospital floor	Units of red blood cells	Units of fresh frozen plasma
Patient with IAI requiring therapeutic laparotomy or angiography	1.8	4.5	0.3	0.2
Patient with IAI requiring a blood transfusion or intravenous fluids for 2 or more nights	1.4	2.4	0.3	0.2
Patient with no IAI, receiving an abdominal CT scan, and admitted to hospital	0	1	0	0
Patient with no IAI , receiving an abdominal CT scan, and discharged home	0	0	0	0
Patient with no IAI, not receiving an abdominal CT scan, and admitted to hospital	0	1	0	0
Patient with no IAI, not receiving an abdominal CT scan, and discharged home	0	0	0	0
Patient with a missed IAI	1.8	4.5	0.3	0.2

IAI = intra-abdominal injury requiring acute intervention