Clinical Question
P: In the Adult victim of blunt abdominal trauma
I: Does the use of abdominal CT with IV contrast only
C: Compared to CT with both IV and PO contrast
O: Result in missed serious abdominal injuries

Clinical Scenario
A 37 year old male presents after a major motor vehicle accident in which he was ejected from the vehicle. He is alert and oriented and has no obvious serious external injuries. You wonder if obtaining a CT of the abdomen with IV contrast alone will be as sensitive in detecting serious abdominal injuries as a CT with both IV and oral contrast in the adult blunt trauma victim.

Search Strategy
PubMed, Best Bets, Cochrane Database

Search terms: CT, Contrast, Trauma, Blunt

Search Outcome
Best Bets had one systematic review which analyzed 3 papers, 2 of which are relevant to my question (the other studied children). PubMed search produced 246 papers, 6 of which were relevant to my question (including the two papers reviewed in the Best Bets review). The Cochrane database had no reviews relevant to my question.

Author	Group	Study Type	Outcomes	Key Results	Weaknesses
Holmes, et al 2004	6052 trauma patients undergoing CT with IV but no PO contrast between 1996 and 2001	Retrospective	Sensitivity for blunt intraabdominal injury	76% sensitive (81/106) for GI tract injuries and 91% sensitive (58/64) for major GI tract injuries 4% (238/6052)	Retrospective
Allen, et al 2004	500 consecutive trauma patients receiving IV but no PO contrast between 2000-2001	Prospective	Sensitivity and Specificity for BBMI	Sensitivity 95% (19/20) Specificity 99.6% (2 false positives)	Not an equivalence study Small number of injuries
Stuhlfaut, et al 2004	1082 trauma patients undergoing CT without PO contrast	Retrospective chart review	Sensitivity, specificity, PPV, and NPV for intraabdominal injury	Sensitivity 82% Specificity 99% PPV 64% NPV 99%	Retrospective Small number of injuries
Stafford, et al 1999	199 trauma patients between 1993 and 1996 receiving PO contrast 195 patients receiving no oral contrast	Randomized Control Trial	PO contrast solid organ injury detection PO contrast intestinal perforation detection No PO contrast solid organ injury detection	84% sensitivity 94% specificity 86% sensitivity 100%specificity 88.9% sensitivity 51.7% specificity	Non-blinded

			No PO contrast intestinal perforation detection	100% sensitivity 100% specificity	
Tsang, et al 1997	Blunt trauma patients receiving abdominal CT with PO contrast between 1988 and 1993	Retrospective chart review and CT re-eval	PO contrast sensitivity and necessity in injury diagnosis	PO contast CT 100% sensitive (31/31) for liver spleen injury, but PO deemed unneeded in all of these; PO contrast 4% sensitive (1/22) for mesenteric injury, but PO contrast deemed unneeded in all of these; PO contrast 50% sensitive (3/6) for pancreas injury, PO contrast deemed needed for two of these: PO contrast 100% specific for injury (no false positives) and PO contrast deemed unneeded	Retrospective Not all charts reviewed
Clancy, et al 1993	492 patients undergoing CT for blunt abdominal trauma between 1998 and 1991	Retrospective review	PO contrast sensitivity for diagnosis of abdominal injury	Only 1/372 patients with a negative CT later required surgery	Retrospective

Comment(s)

The majority of studies are retrospective and more large prospective studies need to be done to definitively answer the question.

Clinical Bottom Line

IV contrast plus oral contrast does not appear to offer any advantage to CT diagnosis of blunt abdominal injury compared to IV contrast alone.

Relevant papers

Allen TL, Mueller MT, Bonk RT, Harker CP, Duffy OH, Stevens MH.

Computed tomographic scanning without oral contrast solution for blunt bowel and mesenteric injuries in abdominal trauma.

J Trauma. 2004 Feb;56(2):314-22.

Stafford RE, McGonigal MD, Weigelt JA, Johnson TJ.

Oral contrast solution and computed tomography for blunt abdominal trauma: a randomized study.

Arch Surg. 1999 Jun;134(6):622-6; discussion 626-7.

Clancy TV, Ragozzino MW, Ramshaw D, Churchill MP, Covington DL, Maxwell JG.
Oral contrast is not necessary in the evaluation of blunt abdominal trauma by computed tomography.
Am J Surg. 1993 Dec;166(6):680-4; discussion 684-5.

Holmes JF, Offerman SR, Chang CH, Randel BE, Hahn DD, Frankovsky MJ, Wisner DH.
Performance of helical computed tomography without oral contrast for the detection of gastrointestinal injuries.
Ann Emerg Med. 2004 Jan;43(1):120-8. Review.

Tsang BD, Panacek EA, Brant WE, Wisner DH.
Effect of oral contrast administration for abdominal computed tomography in the evaluation of acute blunt trauma.
Ann Emerg Med. 1997 Jul;30(1):7-13.

Stuhlfaut JW, Soto JA, Lucey BC, Ulrich A, Rathlev NK, Burke PA, Hirsch EF.
Blunt abdominal trauma: performance of CT without oral contrast material.
Radiology. 2004 Dec;233(3):689-94. Epub 2004 Oct 29.