Table 1

Compliance with audit standards.

Recommendation	Target	Non-surgical			Surgical			ALL		
		%	*95% CI**	*n/N*	%	*95% CI*	*n/N*	%	*95% CI*	*n/N*
Major discrepancy rate (provisional report - registrar) †	< 10%	2.8	(1.8%, 4.1%)	25/887	6.3	(4.3%, 9.2%)	56/882	4.6	(3.4%, 6.1%)	81/1769
Major discrepancy rate (provisional report - offsiter) ‡	< 5%	5.2	(2.4%, 9.9%)	11/210	12.7	(8.1%, 19.3%)	23/181	8.7	(6.0%, 13.1%)	34/391
Major discrepancy rate (provisional report - trust Consultant radiologist) §	< 5%	2.4	(1.6%, 3.6%)	36/1471	3.9	(2.7%, 5.6%)	49/1263	3.1	(2.3%, 4.3%)	85/2734
Major discrepancy rate (addendum report)	< 5%	3.1	(1.9%, 4.5%)	19/621	2.7	(1.6%, 4.1%)	17/635	2.9	(2.1%, 3.8%)	36/1256
Overall major discrepancy rate where the patient came to harm	< 1%	0.6	(0.3%, 1.0%)	15/2568	1.5	(1.0%, 2.4%)	36/2363	1.0	(0.7%, 1.5%)	51/4931
Minor discrepancy rate (provisional report - registrar)	< 20%	10.7	(8.4%, 13.4%)	95/887	6.1	(4.2%, 8.7%)	54/882	8.4	(6.9%, 10.1%)	149/1769
Minor discrepancy rate (provisional report - offsiter)	< 10%	11.4	(6.8%, 19.4%)	24/210	9.9	(5.2%, 16.9%)	18/181	10.7	(7.0%, 16.8%)	42/391
Minor discrepancy rate (provisional report - trust Consultant radiologist)	< 10%	6.6	(4.9%, 8.7%)	97/1471	5.8	(4.3%, 7.8%)	73/1263	6.2	(5.0%, 7.7%)	170/2734
Minor discrepancy rate (addendum report)	< 10%	8.9	(6.5%, 11.6%)	55/621	5.7	(3.9%, 8.9%)	36/635	7.2	(5.5%, 9.4%)	91/1256
Correlation CT report with laparotomy findings (provisional report - registrar)	> 80%	–		–	83.7	(79.8%, 86.6%)	728/870	–		
Correlation CT report with laparotomy findings (provisional report - offsiter)	> 90%	–		–	78.9	(72.0%, 84.3%)	138/175	–		
Correlation CT report with laparotomy findings (provisional report, onsite trust Consultant)	> 90%	–		–	88.9	(87.0%, 90.5%)	1094/1231	–		
Correlation CT report with laparotomy findings (addendum report)	> 90%	–		–	87.2	(83.5%, 90.0%‖)	554/635	–		
Written or validated report available prior to surgery (provisional report)	100%	–		–	98.3	(96.9%, 99.2%)	2197/2234	–		
Written or validated report available prior to surgery (addendum report)	100%	–		–	64.3	(53.9%, 73.7%)	356/554	–		

* If the whole of a 95% confidence interval lies on the correct side of a target value then we can say that we have statistically significant evidence that the target in question is being met. If the whole of the 95% confidence interval lies on the wrong side of a target value then we can say that we have statistically significant evidence that a target is not being met. If the 95% confidence interval spans the target value then we do not have statistically significant evidence either way.

† A registrar is a trainee radiologist (provides provisional/initial CT reports).

‡ An offsiter is a radiologist, usually senior (Consultant level) working for an outsourcing agency and remote from the scanning hospital (provides provisional/initial CT reports).

§ A trust Consultant radiologist based onsite in the scanning hospital (provides provisional/initial CT reports +/- addendum reports depending on local policies).

‖ 89.99% to 2 decimal places.

Table 2
Department demographics (Institutional Questionnaire).

	n	%
Home nation (*n* = 109)		
England	89	81.7
Northern Ireland	3	2.8
Scotland	10	9.2
Wales	7	6.4
CT auditor (primary reviewer) (*n* = 109)		
Subspeciality interest GI radiology (min 5 sessions per week) *	19	17.4
General radiologist	55	50.5
General with GI interest (attends GI MDT) †	26	23.9
Member BSGAR ‡	9	8.3
2nd CT auditor (consensus discrepancy opinion) (*n* = 109)		
Subspeciality interest GI radiology	23	21.1
General radiologist	34	31.2
General with GI interest	41	37.6
Member BSGAR	8	7.3
Not applicable	2	1.8
No response	1	0.9
Type of institution (*n* = 109)		
DGH (district general hospital)	77	70.6
Teaching	32	29.4
On-call CT reporting provided by registrar? (*n* = 109)		
Yes	61	56.0
No	48	44.0
On-call CT reporting provided by onsite Trust Consultant? (*n* = 109)		
Yes	64	58.7
Partial	35	32.1
No	10	9.2
On-call CT reporting provided by offsite radiologist? (outsourced) (*n* = 109)		
Yes	38	34.9
No	71	65.1
On-call CT reports provided by: (*n* = 109)		
Transcription	26	23.9
Voice recognition	66	60.6
Other	16	14.7
No response	1	0.9
Speciality GI radiologist onsite (*n* = 109)		
Yes	58	53.2
No	51	46.8
Review of registrar on-call CT (*n* = 61)		
Next morning	35	57.4
Next working day	13	21.3
Other	2	3.3
No response	11	18.0
Is there onsite review routinely of outsourced (non-Trust) CT on-call reports? (*n* = 38)		
Yes	16	42.1
No	22	57.9
Who reviews outsourced CT reports? (*n* = 16)		
Formal subspeciality interest GI radiology	2	12.5
General radiologist	11	68.8
General with GI interest	2	12.5
No response	1	6.3
Acute surgery onsite? (*n* = 109)		
Yes	108	99.1
No	1	0.9

* Subspeciality interest GI radiology is a radiologist with a minimum of five sessions of GI radiology.
† General radiologist with GI interest is a radiologist with sessions in GI radiology and who attends GI multidisciplinary team meetings.
‡ BSGAR is the British Society of Gastrointestinal and Abdominal Radiology.

Table 3
Case demographics.

	Non-surgical (*n* = 2568)		Surgical (n = 2363)	
	n	%	*n*	%
Home Nation				
England	2084	81.2	2013	85.2
Northern Ireland	75	2.9	54	2.3
Scotland	242	9.4	148	6.3
Wales	167	6.5	148	6.3
Age				
16–20	29	1.1	37	1.6
21–30	180	7.0	119	5.0
31–40	214	8.3	194	8.2
41–50	316	12.3	276	11.7
51–60	365	14.2	387	16.4
61–70	464	18.1	504	21.3
71–80	513	20.0	519	22.0
81–90	405	15.8	287	12.1
>90	82	3.2	36	1.5
No response	0	0.0	4	0.2
Gender				
Male	1223	47.6	1125	47.6
Female	1345	52.4	1234	52.2
No response	0	0.0	4	0.2
Source CT request				
Accident and Emergency	462	18.0	291	12.3
Anaesthetist	16	0.6	16	0.7
Obs/Gynae	32	1.2	28	1.2
Physician	492	19.2	163	6.9
Surgeon (general/colorectal upper GI)	1478	57.6	1822	77.1
Surgeon - other	19	0.7	3	0.1
Urologist	40	1.6	17	0.7
Vascular surgeon	24	0.9	17	0.7
Other	5	0.2	2	0.1
No response	0	0.0	4	0.2
Nature of provisional CT reporter				
Offsiter	210	8.2	181	7.7
Registrar	887	34.5	882	37.3

Hospital Consultant, unspecified	22	0.9	0	0.0
Hospital Consultant, general	1028	40.0	876	37.1
Hospital Consultant, GI interest	146	5.7	128	5.4
Hospital Consultant, GI subspecialty interest (min 5 sessions) GI radiology	275	10.7	259	11.0
No response	0	0.0	37	1.6
Nature of onsite Consultant radiologist addendum reporter (non-surgical, *n* = 621; surgical, *n* = 635)				
General radiologist	466	75.0	442	69.6
General with GI interest (attends GI MDT)	27	4.3	28	4.4
GI radiology subspecialty interest (min 5 sessions per week)	112	18.0	144	22.7
No response	16	2.6	21	3.3

Table 4

Characteristics of major discrepancies on CT auditor review.

	Non-surgical				Surgical			
	Provisional (*n* =72)		Addendum (*n* = 19)		Provisional (*n* =132)		Addendum (*n* = 17)	
	n	%	*n*	%	*n*	%	*n*	%
Nature of the discrepancy								
False negative	25	34.7	9	47.4	40	30.3	4	23.5
False positive	13	18.1	3	15.8	8	6.1	1	5.9
Indeterminate reporting	4	5.6	0	0.0	16	12.1	2	11.8
Misdiagnosis	24	33.3	5	26.3	50	37.9	8	47.1
No response	6	8.3	2	10.5	18	13.6	2	11.8

Table 5

Comparison of risks of major discrepancies between provisional report and auditor for Consultants, Registrars and Offsiters.

	Non-Surgical Discrepancies		Surgical Discrepancies		Pooled
Group	Numbers (%)	Risk Ratio (95% CI)	Numbers (%)	Risk Ratio (95% CI)	Risk Ratio (95% CI
Consultant	36/1471 (2.4%)	1	49/1263 (3.9%)	1	1
Registrar	25/887 (2.8%)	1.15 (0.65, 2.03)	56/882 (6.3%)	1.64 (0.98, 2.74)	1.44 (0.95, 2.18)
Offsiter	11/210 (5.2%)	2.14 (1.01, 4.54)	23/181 (12.7%)	3.28 (1.84, 5.84)	2.81 (1.75, 4.51)
No response	-	-	4/37 (10.8%)	-	-
Total	72/2568 (2.8%)	-	132/2363 (5.6%)	-	-
Between group comparison	-	p = 0.12	-	p = 0.0003	p = 0.0001

Table 6

Discrepancies between auditor and either provisional, addendum or both, for reports with an addendum.

	No discrepancy with either provisional or addendum	Discrepancy with provisional, but not with addendum	Discrepancy with addendum, not with provisional	Discrepancy with both provisional and addendum		Overall Risk of discrepancy	
				Provisional and addendum agree	Provisional and addendum disagree	Provisional	Addendum
All discrepancies:							
Non-Surgical (N=621)	472	75	26	35	13	75+35+13 = 123/621 (19.8%)	26+35+13 = 74/621 (11.9%)
						p<0.0001	
Surgical (N=635)	510	72	13	27	13	72+27+13 = 112/635 (17.6%)	13+27+13 = 53/635 (8.3%)
						p<0.0001	
Major discrepancies only:							
Non-Surgical (N=621)	583	19	3	12	4	19+12+4 = 35/621 (5.6%)	3+12+4 = 19/621 (3.1%)
						p=0.006	
Surgical (N=635)	573	45	2	8	7	45+8+7= 60/635 (9.4%)	2+8+7 = 17/635 (2.7%)
						p<0.0001	

Appendix A

Supplementary data for the non-surgical group

HOME NATION					
England	2084	81.2%			
Northern Ireland	75	2.9%			
Scotland	242	9.4%			
Wales	167	6.5%			
Grand Total	2568	100.0%			
Q1					
AGE					
16–20	29	1.1%			
21–30	180	7.0%			
31–40	214	8.3%			
41–50	316	12.3%			
51–60	365	14.2%			
61–70	464	18.1%			
71–80	513	20.0%			
81–90	405	15.8%			
>90	82	3.2%			
Grand Total	2568	100.0%			
Q2					
GENDER					
Male	1223	47.6%			
Female	1345	52.4%			
Grand Total	2568	100.0%			
Q3a					
SOURCE CT REQUEST					
Accident and Emergency	462	18.0%			

Anaesthetist	16	0.6%			
Obs/Gynae	32	1.2%			
Physician	492	19.2%			
Surgeon (general/colorectal upper GI)	1478	57.6%			
Surgeon - other	19	0.7%			
Urologist	40	1.6%			
Vascular surgeon	24	0.9%			
Other	5	0.2%			
Grand Total	2568	100.0%			
PROVISIONAL CT REPORT / CT AUDITOR REVIEW					
Q4					
NATURE OF PROVISIONAL CT REPORTER					
Offsite radiologist, non-Trust	210	8.2%			
Registrar	887	34.5%			
Trust consultant, unspecified	22	0.9%			
Trust consultant, general	1028	40.0%			
Trust consultant, GI interest	146	5.7%			
Trust consultant, GI subspecialty interest (min 5 sessions) GI radiology	275	10.7%			
Grand Total	2568	100.0%			
Q5					
IF PROVISIONAL CT REPORTER IS A REGISTRAR, IS THERE EVIDENCE OF DISCUSSION WITH A CONSULTANT IN THE REPORT?					
Yes	179	20.2%			
No	690	77.8%			
No response	18	2.0%			
Grand Total	887	100.0%			
AUDITOR SUMMARY FINDINGS OF PROVISIONAL CT REPORT Select the most single and pertinent diagnosis (may include 'normal' or 'other') from 'site relating to major diagnosis' and/ or 'minor diagnosis'. Note.- If 'normal', this MUST be entered in 'site relating to major diagnosis' AND 'minor diagnosis'					
Q6					
SITE RELATING TO 'MAJOR DIAGNOSIS' If 'other', proceed straight to Q7b. Leave blank if no major diagnosis					

bone	15	0.6%			
bowel mesentery nodal related	1066	41.5%			
gynaecological	39	1.5%			
hepatobiliary spleen	253	9.9%			
indeterminate report	21	0.8%			
lung/cardiac	52	2.0%			
normal	483	18.8%			
pancreas	155	6.0%			
renal tract	109	4.2%			
vascular	163	6.3%			
other (please include details if not included in list)	16	0.6%			
no response	196	7.6%			
Grand Total	2568	100.0%			
Q7a					
MAJOR DIAGNOSIS Leave blank if no major diagnosis					
BONE					
Acute bone fracture	5	0.2%			
Bony lesion likely aggressive (osteomyelitis, discitis, malignant bone tumour)	9	0.4%			
Large disc protrusion	1	0.0%			
BOWEL MESENTERY NODAL RELATED					
abdo. wall haematoma/abscess	26	1.0%			
abdo. wall hernia/mass	22	0.9%			
acute diverticulitis	67	2.6%			
anastomotic leak	19	0.7%			
appendicitis (uncomplicated)	51	2.0%			
appendix mass, mucocele, abscess	19	0.7%			
bariatric complication (pouch dilatation, roux loop obstruction, gastrogastric fistula)	1	0.0%			
bowel foreign body	1	0.0%			
caecal volvulus	3	0.1%			
closed loop small bowel obstruction	4	0.2%			
colitis (infective, ulcerative, pseudomenbranous)	114	4.4%			
colonic stricture	7	0.3%			
Crohns (small bowel/large bowel)	33	1.3%			
diverticular abscess	26	1.0%			
diverticular perforation	30	1.2%			
epiploic appendagitis	5	0.2%			
extensive/moderate ascites	24	0.9%			
fistula (small bowel, large bowel, other)	4	0.2%			
focal abscess (abdomen/pelvis)	91	3.5%			

focal bleeding point (small bowel/large bowel/stomach bilary/other)	16	0.6%			
free intraperitoneal air (perforation of oesophagus, stomach, duodenum, small bowel, colon, appendix)	46	1.8%			
free intraperitoneal air (site of perforation not seen)	37	1.4%			
gallstone ileus	2	0.1%			
gastric volvulus/distension	2	0.1%			
gastric/small bowel wall thickening	7	0.3%			
gastritis	1	0.0%			
infective ileitis	2	0.1%			
internal herina (bariatric cases Peterson's hernia)	2	0.1%			
intussusception	1	0.0%			
ischaemic bowel (small bowel/colon/stomach)	42	1.6%			
large bowel obstruction	30	1.2%			
lymphadenopathy (abdo, pelvis, other)	21	0.8%			
misplaced tube (NG, drain, other)	3	0.1%			
nonrotation, malrotation	3	0.1%			
omental/mesenteric tumour infiltration	12	0.5%			
omental infarction	3	0.1%			
pseudoobstruction	37	1.4%			
intra abdominal/pelvic/retroperitoneal haematoma (moderate/large)	1	0.0%			
sigmoid volvulus	18	0.7%			
slipped laparoscopic band	1	0.0%			
small bowel lymphoma	4	0.2%			
small bowel ileus	51	2.0%			
small bowel obstruction (adhesion, tumour)	108	4.2%			
stercoral perforation	3	0.1%			
tumour (oesophagus/gastric)	1	0.0%			
tumour (colorectal, small bowel, appendix)	40	1.6%			
No response	25	1.0%			
GYNAECOLOGICAL					
gynaecolo unspecified	22	0.9%			
Ovarian/uterine/vulval mass likely malignant, or ovarian cyst >5cm, or large fibroid >5cm	10	0.4%			
tuboovarian abscess	6	0.2%			
No response	1	0.0%			
HEPATOBILIARY SPLEEN					
acute cholecystitis	112	4.4%			
bile duct dilatation (moderate/severe, no pmh cholecystectomy)	27	1.1%			

Bony lesion likely aggressive (osteomyelitis, discitis, malignant bone tumour)	1	0.0%			
cirrhosis with secondary finding (portal hypertension, portal vein/splenic vein thrombosis, varices, sinistral hypertension)	16	0.6%			
common bile duct calculus	19	0.7%			
focal splenic haematoma (no rupture)	4	0.2%			
focal liver lesion, likely benign (cyst,haemangioma)	15	0.6%			
focal splenic lesion likely benign	2	0.1%			
gallbladder empyema	9	0.4%			
gallbladder tumour	3	0.1%			
liver laceration/haematoma/contusion	2	0.1%			
liver abscess	20	0.8%			
pneumobilia	5	0.2%			
ruptured spleen with intraperitoneal blood	3	0.1%			
splenic infarct, acute,moderate/large	4	0.2%			
splenomegaly (moderate/severe)	4	0.2%			
spontaneous bilary leak or biloma	3	0.1%			
No response	4	0.2%			
INDETERMINATE REPORT					
No response	21	0.8%			
LUNG/CARDIAC					
ARDS	2	0.1%			
cardiac failure	3	0.1%			
pericardial effusion	1	0.0%			
pleural effusion (moderate/large)	1	0.0%			
pneumediastinum/pneumothorax	6	0.2%			
pneumonic changes	15	0.6%			
primary or secondary malignancy in field of view	11	0.4%			
pulmonary embolus	3	0.1%			
No response	10	0.4%			
NORMAL					
normal	483	18.8%			
PANCREAS					
acute pancreatitis	118	4.6%			
chronic pancreatitis	5	0.2%			
pancreatic tumour	14	0.5%			
pancreatic abscess	4	0.2%			
pancreatic pseudocyst (moderate/large)	14	0.5%			
RENAL TRACT					
adrenal haemorrhage	1	0.0%			
adrenal mass likely malignant	1	0.0%			
bladder infection	1	0.0%			

bladder mass likely malignant	5	0.2%			
colovesical fistula	2	0.1%			
hydro/pyonephrosis (moderate/severe)	34	1.3%			
marked bladder distension	7	0.3%			
prostate abscess	1	0.0%			
renal infection/abscess	10	0.4%			
renal infarct (moderate/large)	11	0.4%			
renal tract calculus, complicated (eg obstructing)	17	0.7%			
renal tumour likely malignant	13	0.5%			
No response	6	0.2%			
VASCULAR					
aneurysm leak (abdominal aorta/thoracic aorta)	30	1.2%			
aortic aneurysm > 5cm	28	1.1%			
aortic dissection	7	0.3%			
arterial occlusion (SMA/IMA/aorta)	9	0.4%			
iliofemoral DVT	5	0.2%			
IVC/Splenic vein/SMV thrombus/portal vein thrombus	6	0.2%			
muscle wall/rectus sheath haematoma	33	1.3%			
other large vessel aneurysm	9	0.4%			
intra abdominal/pelvic/retroperitoneal haematoma (moderate/large)	32	1.2%			
No response	4	0.2%			
OTHER					
No response	16	0.6%			
NO RESPONSE					
No response	196	7.6%			
Grand Total	2568	100.0%			
Q9					
ON CT AUDITOR REVIEW, IS THERE CONCORDANCE WITH PROVISIONAL CT REPORT FINDINGS? If 'yes', proceed straight to Q16; if 'no', proceed straight to Q10					
Yes	2280	88.8%			
No	288	11.2%			
Grand Total	2568	100.0%			
CT AUDITOR REVIEW Select the most single and pertinent diagnosis (may include 'normal' or 'other') from 'site relating to major diagnosis' and/ or 'minor diagnosis'. Note.- If 'normal', this MUST be entered in 'site relating to major diagnosis' AND 'minor diagnosis'					
Q10					

SITE RELATING TO 'MAJOR DIAGNOSIS' If 'other', proceed straight to Q11b. Leave blank if no major diagnosis					
bone	4	1.4%			
bowel mesentery nodal related	113	39.2%			
gynaecological	4	1.4%			
hepatobiliary spleen	31	10.8%			
lung/cardiac	5	1.7%			
normal	26	9.0%			
pancreas	12	4.2%			
renal tract	10	3.5%			
vascular	12	4.2%			
other (please include details if not included in list)	2	0.7%			
No response	69	24.0%			
Grand Total	288	100.0%			
Q11a					
MAJOR DIAGNOSIS Leave blank if no major diagnosis					
BONE					
Acute bone fracture	3	1.0%			
Bony lesion likely aggressive (osteomyelitis, discitis, malignant bone tumour)	1	0.3%			
BOWEL MESENTERY NODAL RELATED					
abdo. wall hernia/mass	2	0.7%			
acute diverticulitis	7	2.4%			
anastomotic leak	1	0.3%			
appendicitis (uncomplicated)	3	1.0%			
appendix mass, mucocele, abscess	1	0.3%			
caecal volvulus	1	0.3%			
closed loop small bowel obstruction	1	0.3%			
colitis (infective, ulcerative, pseudomenbranous)	14	4.9%			
colonic stricture	3	1.0%			
Crohns (small bowel/large bowel)	3	1.0%			
diverticular abscess	4	1.4%			
diverticular perforation	1	0.3%			
epiploic appendagitis	2	0.7%			
extensive/moderate ascites	1	0.3%			
focal abscess (abdomen/pelvis)	7	2.4%			
focal bleeding point (small bowel/large bowel/stomach bilary/other)	1	0.3%			
free intraperitoneal air (perforation of oesophagus, stomach, duodenum, small bowel, colon, appendix)	10	3.5%			
free intraperitoneal air (site of perforation not seen)	2	0.7%			
gastric volvulus/distension	1	0.3%			

internal herina (bariatric cases Peterson's hernia)	1	0.3%			
intussusception	1	0.3%			
ischaemic bowel (small bowel/colon/stomach)	7	2.4%			
large bowel obstruction	6	2.1%			
lymphadenopathy (abdo, pelvis, other)	3	1.0%			
omental/mesenteric tumour infiltration	2	0.7%			
omental infarction	1	0.3%			
pseudoobstruction	5	1.7%			
sigmoid volvulus	3	1.0%			
small bowel lymphoma	1	0.3%			
small bowel ileus	2	0.7%			
small bowel obstruction (adhesion, tumour)	10	3.5%			
tumour (oesophagus/gastric)	1	0.3%			
tumour (colorectal, small bowel, appendix)	3	1.0%			
No response	2	0.7%			
GYNAECOLOGICAL					
Ovarian/uterine/vulval mass likely malignant, or ovarian cyst >5cm, or large fibroid >5cm	1	0.3%			
tuboovarian abscess	2	0.7%			
No response	1	0.3%			
HEPATOBILIARY SPLEEN					
acute cholecystitis	10	3.5%			
cirrhosis with secondary finding (portal hypertension, portal vein/splenic vein thrombosis, varices, sinistral hypertension)	3	1.0%			
common bile duct calculus	4	1.4%			
focal liver lesion, likely benign (cyst,haemangioma)	6	2.1%			
gallbladder empyema	1	0.3%			
gallbladder tumour	1	0.3%			
liver abscess	1	0.3%			
pneumobilia	1	0.3%			
ruptured spleen with intraperitoneal blood	2	0.7%			
splenic infarct, acute,moderate/large	1	0.3%			
No response	1	0.3%			
LUNG/CARDIAC					
pneumonic changes	3	1.0%			
pulmonary embolus	2	0.7%			
NORMAL					
normal	26	9.0%			
PANCREAS					
acute pancreatitis	8	2.8%			
pancreatic tumour	1	0.3%			
pancreatic abscess	1	0.3%			

pancreatic pseudocyst (moderate/large)	2	0.7%			
RENAL TRACT					
adrenal haemorrhage	1	0.3%			
bladder mass likely malignant	2	0.7%			
hydro/pyonephrosis (moderate/severe)	2	0.7%			
renal infection/abscess	3	1.0%			
renal tract calculus, complicated (eg obstructing)	1	0.3%			
No response	1	0.3%			
VASCULAR					
aneurysm leak (abdominal aorta/thoracic aorta)	2	0.7%			
arterial occlusion (SMA/IMA/aorta)	3	1.0%			
iliofemoral DVT	1	0.3%			
muscle wall/rectus sheath haematoma	1	0.3%			
other large vessel aneurysm	2	0.7%			
intra abdominal/pelvic/retroperitoneal haematoma (moderate/large)	3	1.0%			
OTHER					
No response	2	0.7%			
NO RESPONSE					
No response	69	24.0%			
Grand Total	288	100.0%			
Q12c					
ADDITIONAL INCORRECT SECONDARY MAJOR DIAGNOSIS/ES IN PROVISIONAL REPORT					
Yes	8	2.8%			
No	36	12.5%			
No response	244	84.7%			
Grand Total	288	100.0%			
Q12d					
ADDITIONAL INCORRECT SECONDARY MINOR DIAGNOSIS/ES IN PROVISIONAL REPORT					
Yes	15	5.2%			
No	48	16.7%			
No response	225	78.1%			
Grand Total	288	100.0%			
Q12e					
ADDITIONAL SECONDARY INDETERMINATE REPORTING IN PROVISIONAL REPORT					
Yes	7	2.4%			
No	40	13.9%			
No response	241	83.7%			
Grand Total	288	100.0%			

Q13					
HOW WOULD YOU GRADE THE LEVEL OF DISCREPANCY? If 'minor', proceed straight to Q16					
Major	72	25.0%			
Minor	216	75.0%			
Grand Total	288	100.0%			
Q14					
CT AUDITOR CLASSIFICATION					
Interpretation discrepancy - CT diagnosis not ordinarily expected to be made (understandable miss)	29				
Interpretation discrepancy - CT diagnosis should be made most of the time	41				
No response	2				
Grand Total	72				
Q15					
NATURE OF THE DISCREPANCY					
False negative	25	34.7%			
False positive	13	18.1%			
Indeterminate reporting	4	5.6%			
Misdiagnosis	24	33.3%			
No response	6	8.3%			
Grand Total	72	100.0%			
ADDENDUM CT REPORT/ PROVISIONAL CT REPORT					
Q16					
IS THERE EVIDENCE OF AN ADDENDUM REPORT? if 'no', proceed straight to Q32					
Yes	621	24.2%			
No	1947	75.8%			
Grand Total	2568	100.0%			
Q17					
NATURE OF THE TRUST CONSULTANT RADIOLOGIST ADDENDUM REPORTER					
General radiologist	466	75.0%			
General with GI interest (attends GI MDM)	27	4.3%			
GI radiology subspecialty interest (min 5 sessions per week)	112	18.0%			
No response	16	2.6%			

Grand Total	621	100.0%			
FINDINGS OF ADDENDUM CT REPORT Select the most single and pertinent diagnosis (may include 'normal' or 'other') from 'site relating to major diagnosis' and/ or 'minor diagnosis'. Note.- If 'normal', this MUST be entered in 'site relating to major diagnosis' AND 'minor diagnosis'					
Q18					
SITE RELATING TO 'MAJOR DIAGNOSIS' If 'other', proceed straight to Q19b. Leave blank if no major diagnosis					
bone	2	0.3%			
bowel mesentery nodal related	259	41.7%			
gynaecological	12	1.9%			
hepatobiliary spleen	61	9.8%			
indeterminate report	3	0.5%			
lung/cardiac	6	1.0%			
normal	101	16.3%			
pancreas	47	7.6%			
renal tract	30	4.8%			
vascular	37	6.0%			
other (please include details if not included in list)	5	0.8%			
No response	58	9.3%			
Grand Total	621	100.0%			
Q19a					
MAJOR DIAGNOSIS Leave blank if no major diagnosis					
BONE					
Acute bone fracture	1	0.2%			
Bony lesion likely aggressive (osteomyelitis, discitis, malignant bone tumour)	1	0.2%			
BOWEL MESENTERY NODAL RELATED					
abdo. wall haematoma/abscess	7	1.1%			
abdo. wall hernia/mass	6	1.0%			
acute diverticulitis	14	2.3%			
anastomotic leak	3	0.5%			
appendicitis (uncomplicated)	5	0.8%			
appendix mass, mucocele, abscess	3	0.5%			
bariatric complication (pouch dilatation, roux loop obstruction, gastrogastric fistula)	1	0.2%			
closed loop small bowel obstruction	2	0.3%			
colitis (infective, ulcerative, pseudomenbranous)	36	5.8%			

colonic stricture	2	0.3%			
Crohns (small bowel/large bowel)	10	1.6%			
diverticular abscess	4	0.6%			
diverticular perforation	2	0.3%			
extensive/moderate ascites	5	0.8%			
fistula (small bowel, large bowel, other)	1	0.2%			
focal abscess (abdomen/pelvis)	27	4.3%			
focal bleeding point (small bowel/large bowel/stomach bilary/other)	4	0.6%			
free intraperitoneal air (perforation of oesophagus, stomach, duodenum, small bowel, colon, appendix)	8	1.3%			
free intraperitoneal air (site of perforation not seen)	9	1.4%			
gastric volvulus/distension	1	0.2%			
gastric/small bowel wall thickening	2	0.3%			
ischaemic bowel (small bowel/colon/stomach)	16	2.6%			
large bowel obstruction	10	1.6%			
lymphadenopathy (abdo, pelvis, other)	5	0.8%			
misplaced tube (NG, drain, other)	1	0.2%			
nonrotation, malrotation	1	0.2%			
omental/mesenteric tumour infiltration	1	0.2%			
omental infarction	1	0.2%			
pseudoobstruction	11	1.8%			
sigmoid volvulus	4	0.6%			
small bowel lymphoma	1	0.2%			
small bowel ileus	14	2.3%			
small bowel obstruction (adhesion, tumour)	24	3.9%			
stercoral perforation	1	0.2%			
tumour (oesophagus/gastric)	2	0.3%			
tumour (colorectal, small bowel, appendix)	11	1.8%			
No response	4	0.6%			
GYNAECOLOGICAL					
gynaecolo unspecified	6	1.0%			
Ovarian/uterine/vulval mass likely malignant, or ovarian cyst >5cm, or large fibroid >5cm	2	0.3%			
tuboovarian abscess	3	0.5%			
No response	1	0.2%			
HEPATOBILIARY SPLEEN					
acute cholecystitis	27	4.3%			
bile duct dilatation (moderate/severe, no pmh cholecystectomy)	3	0.5%			

cirrhosis with secondary finding (portal hypertension, portal vein/splenic vein thrombosis, varices, sinistral hypertension)	3	0.5%			
common bile duct calculus	9	1.4%			
focal splenic haematoma (no rupture)	1	0.2%			
focal liver lesion, likely benign (cyst,haemangioma)	6	1.0%			
gallbladder empyema	1	0.2%			
gallbladder tumour	1	0.2%			
liver abscess	2	0.3%			
pneumobilia	1	0.2%			
ruptured spleen with intraperitoneal blood	2	0.3%			
splenic infarct, acute,moderate/large	2	0.3%			
spontaneous bilary leak or biloma	2	0.3%			
No response	1	0.2%			
INDETERMINATE REPORT					
No response	3	0.5%			
LUNG/CARDIAC					
cardiac failure	1	0.2%			
pneumediastinum/pneumothorax	1	0.2%			
pneumonic changes	2	0.3%			
pulmonary embolus	1	0.2%			
No response	1	0.2%			
NORMAL					
normal	101	16.3%			
PANCREAS					
acute pancreatitis	35	5.6%			
chronic pancreatitis	1	0.2%			
pancreatic tumour	3	0.5%			
pancreatic abscess	1	0.2%			
pancreatic pseudocyst (moderate/large)	6	1.0%			
No response	1	0.2%			
RENAL TRACT					
adrenal haemorrhage	1	0.2%			
bladder infection	1	0.2%			
bladder mass likely malignant	1	0.2%			
hydro/pyonephrosis (moderate/severe)	9	1.4%			
marked bladder distension	2	0.3%			
pyelonephritis	3	0.5%			
renal infection/abscess	1	0.2%			
renal infarct (moderate/large)	2	0.3%			
renal tract calculus, complicated (eg obstructing)	6	1.0%			
renal tumour likely malignant	4	0.6%			
VASCULAR					

aneurysm leak (abdominal aorta/thoracic aorta)	5	0.8%			
aortic aneurysm > 5cm	7	1.1%			
aortic dissection	2	0.3%			
arterial occlusion (SMA/IMA/aorta)	2	0.3%			
iliofemoral DVT	2	0.3%			
IVC/Splenic vein/SMV thrombus/portal vein thrombus	1	0.2%			
muscle wall/rectus sheath haematoma	9	1.4%			
other large vessel aneurysm	1	0.2%			
intra abdominal/pelvic/retroperitoneal haematoma (moderate/large)	8	1.3%			
OTHER					
No response	5	0.8%			
NO RESPONSE					
No response	58	9.3%			
Grand Total	621	100.0%			
Q21					
IS THERE CONCORDANCE OF THE ADDENDUM REPORT WITH PROVISIONAL REPORT FINDINGS? If 'yes', proceed straight to Q25					
Yes	507	81.6%			
No	114	18.4%			
Grand Total	621	100.0%			
Q22					
HOW WOULD YOU GRADE THE LEVEL OF DISCREPANCY?					
Major	26	22.8%			
Minor	88	77.2%			
Grand Total	114	100.0%			
Q23					
CT AUDITOR CLASSIFICATION					
Interpretation discrepancy - CT diagnosis not ordinarily expected to be made (understandable miss)	9	34.6%			
Interpretation discrepancy - CT diagnosis should be made most of the time	15	57.7%			
No response	2	7.7%			
Grand Total	26	100.0%			
Q24					
NATURE OF THE DISCREPANCY					
False negative	10	38.5%			
False positive	6	23.1%			
Indeterminate reporting	1	3.8%			
Misdiagnosis	7	26.9%			

No response	2	7.7%			
Grand Total	26	100.0%			
CT AUDITOR REVIEW/ ADDENDUM CT REPORT					
Q25					
ON CT AUDITOR REVIEW, IS THERE CONCORDANCE WITH ADDENDUM CT REPORT FINDINGS? If 'yes', proceed straight to Q32					
Yes	547	88.1%			
No	74	11.9%			
Grand Total	621	100.0%			
Q26					
HOW WOULD YOU GRADE THE LEVEL OF DISCREPANCY?					
Major	19	25.7%			
Minor	55	74.3%			
Grand Total	74	100.0%			
Q27					
CT AUDITOR CLASSIFICATION					
Interpretation discrepancy - CT diagnosis not ordinarily expected to be made (understandable miss)	4	21.1%			
Interpretation discrepancy - CT diagnosis should be made most of the time	13	68.4%			
No response	2	10.5%			
Grand Total	19	100.0%			
Q28					
NATURE OF THE DISCREPANCY					
False negative	9	47.4%			
False positive	3	15.8%			
Misdiagnosis	5	26.3%			
No response	2	10.5%			
Grand Total	19	100.0%			
Q29					
ADDITIONAL INCORRECT SECONDARY MAJOR DIAGNOSIS/ES IN ADDENDUM REPORT					
Yes	1	5.3%			
No	6	31.6%			
No response	12	63.2%			
Grand Total	19	100.0%			
Q30					

ADDITIONAL INCORRECT SECONDARY MINOR DIAGNOSIS/ES IN ADDENDUM REPORT					
No	5	26.3%			
No response	14	73.7%			
Grand Total	19	100.0%			
Q31					
ADDITIONAL SECONDARY INDETERMINATE REPORTING IN ADDENDUM REPORT					
Yes	1	5.3%			
No	4	21.1%			
No response	14	73.7%			
Grand Total	19	100.0%			
CT AUDITOR REVIEW/ SUBSEQUENT ADDITIONAL PROCEDURE					
Q32					
ON IMAGING AND NOTES REVIEW, IS THERE EVIDENCE OF SUBSEQUENT ADDITIONAL PROCEDURE THAT MAY HAVE BEEN UNNECESSARY? If 'no', proceed straight to Q36; If 'yes', proceed straight to Q33a					
Yes	47	1.8%			
No	2476	96.4%			
No response	45	1.8%			
Grand Total	2568	100.0%			
Q33					
PLEASE CHOOSE WHICH PROCEDURE					
Antibiotic treatment	1	2.1%			
Colonoscopy	1	2.1%			
Contrast study	6	12.8%			
CT	7	14.9%			
CXR/AXR	2	4.3%			
Endoscopy	2	4.3%			
Laparotomy	1	2.1%			
MR	3	6.4%			
Nuclear medicine study	1	2.1%			
Ultrasound Angiography	8	17.0%			
US	2	4.3%			
US/CT drainage	3	6.4%			
No response	10	21.3%			
Grand Total	47	100.0%			
Q34					
ON IMAGING AND NOTES REVIEW, IS THERE EVIDENCE OF SUBSEQUENT ADDITIONAL PROCEDURE THAT CONFIRMED THE DIAGNOSIS WAS A MAJOR DISCREPANCY? If 'no', proceed straight to Q36					

Yes	7	14.9%			
No	26	55.3%			
No response	14	29.8%			
Grand Total	47	100.0%			
Q35a					
Contrast study	2	28.6%			
CT	2	28.6%			
Laparotomy	1	14.3%			
Nuclear medicine study	1	14.3%			
US/CT biopsy	1	14.3%			
Grand Total	7	100.0%			
Q36					
OVERALL, HOW WOULD YOU CODE THIS PATIENT?					
Major discrepancy and patient came to harm	15	0.6%			
Major discrepancy and patient did not come to harm	46	1.8%			
Major discrepancy patient outcome unclear	14	0.5%			
Minor discrepancy	239	9.3%			
No issues with report	2254	87.8%			
Grand Total	2568	100.0%			
Q37a					
IN CASES OF MAJOR DISCREPANCY, IF A PATIENT CAME TO HARM, WHAT WAS THE NATURE OF THE HARM?					
Delay in diagnosis	7	46.7%			
Delay in surgery	5	33.3%			
Unnecessary intervention	2	13.3%			
Other (free text)	1	6.7%			
Grand Total	15	100.0%			

Supplementary data for the surgical group

HOME NATION					
England	2013	85.2%			
Northern Ireland	54	2.3%			
Scotland	148	6.3%			
Wales	148	6.3%			
Grand Total	2363	100.0%			
Q1					
AGE					
16–20	37	1.6%			
21–30	119	5.0%			
31–40	194	8.2%			
41–50	276	11.7%			
51–60	387	16.4%			

61–70	504	21.3%			
71–80	519	22.0%			
81–90	287	12.1%			
>90	36	1.5%			
No response	4	0.2%			
Grand Total	2363	100.0%			
Q2					
GENDER					
Male	1125	47.6%			
Female	1234	52.2%			
No response	4	0.2%			
Grand Total	2363	100.0%			
Q3a					
SOURCE CT REQUEST					
Accident and Emergency	291	12.3%			
Anaesthetist	16	0.7%			
Obs/Gynae	28	1.2%			
Physician	163	6.9%			
Surgeon (general/colorectal upper GI)	1822	77.1%			
Surgeon - other	3	0.1%			
Urologist	17	0.7%			
Vascular surgeon	17	0.7%			
Other	2	0.1%			
No response	4	0.2%			
Grand Total	2363	100.0%			
PROVISIONAL CT REPORT / CT AUDITOR REVIEW					
Q4					
NATURE OF PROVISIONAL CT REPORTER					
Offsite radiologist, non-Trust	181	7.7%			
Registrar	882	37.3%			
Trust consultant, general	876	37.1%			
Trust consultant, GI interest	128	5.4%			
Trust consultant, GI subspecialty interest (min 5 sessions) GI radiology	259	11.0%			
No response	37	1.6%			
Grand Total	2363	100.0%			
Q5					
Nature of provisional CT reporter					

IF PROVISIONAL CT REPORTER IS A REGISTRAR, IS THERE EVIDENCE OF DISCUSSION WITH A CONSULTANT IN THE REPORT?					
Yes	179	20.3%			
No	675	76.5%			
No response	28	3.2%			
Grand Total	882	100.0%			
AUDITOR SUMMARY FINDINGS OF PROVISIONAL CT REPORT Select the most single and pertinent diagnosis (may include 'normal' or 'other') from 'site relating to major diagnosis' and/ or 'minor diagnosis'. Note.- If 'normal', this MUST be entered in 'site relating to major diagnosis' AND 'minor diagnosis'					
Q6					
SITE RELATING TO 'MAJOR DIAGNOSIS' If 'other', proceed straight to Q7b. Leave blank if no major diagnosis					
bowel mesentery nodal related	2052	86.8%			
gynaecological	48	2.0%			
hepatobiliary spleen	76	3.2%			
indeterminate report	6	0.3%			
lung/cardiac	4	0.2%			
normal	33	1.4%			
pancreas	11	0.5%			
renal tract	10	0.4%			
vascular	68	2.9%			
other	10	0.4%			
No response	45	1.9%			
Grand Total	2363	100.0%			
Q7a					
MAJOR DIAGNOSIS Leave blank if no major diagnosis					
BOWEL MESENTERY NODAL RELATED					
abdo. wall haematoma/abscess	16	0.7%			
abdo. wall hernia/mass	10	0.4%			
acute diverticulitis	12	0.5%			
anastomotic leak	43	1.8%			
appendicitis (uncomplicated)	271	11.5%			
appendix mass, mucocele, abscess	85	3.6%			
bariatric complication (pouch dilatation, roux loop obstruction, gastrogastric fistula)	2	0.1%			
bladder perforation	3	0.1%			
bowel foreign body	1	0.0%			
caecal volvulus	22	0.9%			

closed loop small bowel obstruction	40	1.7%			
colitis (infective, ulcerative, pseudomenbranous)	36	1.5%			
colonic stricture	16	0.7%			
Crohns (small bowel/large bowel)	22	0.9%			
diverticular abscess	29	1.2%			
diverticular perforation	99	4.2%			
epiploic appendagitis	1	0.0%			
extensive/moderate ascites	11	0.5%			
focal abscess (abdomen/pelvis)	50	2.1%			
focal bleeding point (small bowel/large bowel/stomach bilary/other)	10	0.4%			
free intraperitoneal air (perforation of oesophagus, stomach, duodenum, small bowel, colon, appendix)	258	10.9%			
free intraperitoneal air (site of perforation not seen)	124	5.2%			
gallbladder perforation	3	0.1%			
gallstone ileus	13	0.6%			
gastric volvulus/distension	3	0.1%			
gastric/small bowel wall thickening	1	0.0%			
infective ileitis	3	0.1%			
internal herina (bariatric cases Peterson's hernia)	24	1.0%			
intussusception	11	0.5%			
ischaemic bowel (small bowel/colon/stomach)	87	3.7%			
large bowel obstruction	107	4.5%			
lymphadenopathy (abdo, pelvis, other)	2	0.1%			
nonrotation, malrotation	3	0.1%			
omental/mesenteric tumour infiltration	4	0.2%			
omental infarction	4	0.2%			
ovarian torsion	4	0.2%			
pseudoobstruction	6	0.3%			
sigmoid volvulus	10	0.4%			
small bowel lymphoma	6	0.3%			
small bowel ileus	19	0.8%			
small bowel obstruction (adhesion, tumour)	466	19.7%			
stercoral perforation	8	0.3%			
tumour (colorectal, small bowel, appendix)	102	4.3%			
No response	5	0.2%			
GYNAECOLOGICAL					
gynaecolo unspecified	21	0.9%			
Ovarian/uterine/vulval mass likely malignant, or ovarian cyst >5cm, or large fibroid >5cm	2	0.1%			

tuboovarian abscess	22	0.9%			
No response	3	0.1%			
HEPATOBILIARY SPLEEN					
acute cholecystitis	39	1.7%			
bile duct dilatation (moderate/severe, no pmh cholecystectomy)	1	0.0%			
common bile duct calculus	1	0.0%			
focal splenic haematoma (no rupture)	1	0.0%			
focal liver lesion, likely benign (cyst,haemangioma)	2	0.1%			
gallbladder empyema	9	0.4%			
liver laceration/haematoma/contusion	1	0.0%			
liver abscess	1	0.0%			
ruptured spleen with intraperitoneal blood	11	0.5%			
splenic infarct, acute,moderate/large	1	0.0%			
splenomegaly (moderate/severe)	1	0.0%			
spontaneous bilary leak or biloma	8	0.3%			
INDETERMINATE REPORT					
No response	6	0.3%			
lung/cardiac					
pneumonic changes	2	0.1%			
primary or secondary malignancy in field of view	2	0.1%			
NORMAL					
normal	33	1.4%			
PANCREAS					
acute pancreatitis	7	0.3%			
pancreatic tumour	1	0.0%			
pancreatic abscess	2	0.1%			
pancreatic pseudocyst (moderate/large)	1	0.0%			
RENAL TRACT					
bladder mass likely malignant	1	0.0%			
colovesical fistula	1	0.0%			
hydro/pyonephrosis (moderate/severe)	1	0.0%			
renal infarct (moderate/large)	1	0.0%			
renal tract calculus, complicated (eg obstructing)	3	0.1%			
renal tumour likely malignant	2	0.1%			
No response	1	0.0%			
VASCULAR					
aneurysm leak (abdominal aorta/thoracic aorta)	24	1.0%			
aortic aneurysm > 5cm	5	0.2%			
aortic dissection	1	0.0%			
arterial occlusion (SMA/IMA/aorta)	4	0.2%			

IVC/Splenic vein/SMV thrombus/portal vein thrombus	1	0.0%			
muscle wall/rectus sheath haematoma	3	0.1%			
other large vessel aneurysm	4	0.2%			
intra abdominal/pelvic/retroperitoneal haematoma (moderate/large)	26	1.1%			
other (please include details if not included in list)					
No response	10	0.4%			
NO RESPONSE					
No response	45	1.9%			
Grand Total	2363	100.0%			
Q9					
ON CT AUDITOR REVIEW, IS THERE CONCORDANCE WITH PROVISIONAL CT REPORT FINDINGS? If 'yes', proceed straight to Q16; if 'no', proceed straight to Q10					
Yes	2080	88.0%			
No	283	12.0%			
Grand Total	2363	100.0%			
CT AUDITOR REVIEW Select the most single and pertinent diagnosis (may include 'normal' or 'other') from 'site relating to major diagnosis' and/ or 'minor diagnosis'. Note.- If 'normal', this MUST be entered in 'site relating to major diagnosis' AND 'minor diagnosis'					
Q10					
SITE RELATING TO 'MAJOR DIAGNOSIS' If 'other', proceed straight to Q11b. Leave blank if no major diagnosis					
bowel mesentery nodal related	238	84.1%			
gynaecological	12	4.2%			
hepatobiliary spleen	3	1.1%			
indeterminate report	1	0.4%			
lung/cardiac	2	0.7%			
normal	3	1.1%			
vascular	5	1.8%			
other	1	0.4%			
No response	18	6.4%			
Grand Total	283	100.0%			
Q11a					
MAJOR DIAGNOSIS Leave blank if no major diagnosis					
BOWEL MESENTERY NODAL RELATED					
abdo. wall haematoma/abscess	2	0.7%			
abdo. wall hernia/mass	1	0.4%			

acute diverticulitis	4	1.4%			
anastomotic leak	7	2.5%			
appendicitis (uncomplicated)	14	4.9%			
appendix mass, mucocele, abscess	21	7.4%			
caecal volvulus	2	0.7%			
closed loop small bowel obstruction	5	1.8%			
colitis (infective, ulcerative, pseudomenbranous)	2	0.7%			
colonic stricture	1	0.4%			
diverticular abscess	1	0.4%			
diverticular perforation	12	4.2%			
fistula (small bowel, large bowel, other)	1	0.4%			
focal abscess (abdomen/pelvis)	9	3.2%			
free intraperitoneal air (perforation of oesophagus, stomach, duodenum, small bowel, colon, appendix)	28	9.9%			
free intraperitoneal air (site of perforation not seen)	9	3.2%			
gallbladder perforation	1	0.4%			
gallstone ileus	3	1.1%			
gastric volvulus/distension	1	0.4%			
infective ileitis	3	1.1%			
internal herina (bariatric cases Peterson's hernia)	2	0.7%			
intussusception	2	0.7%			
ischaemic bowel (small bowel/colon/stomach)	9	3.2%			
large bowel obstruction	13	4.6%			
lymphadenopathy (abdo, pelvis, other)	1	0.4%			
omental/mesenteric tumour infiltration	1	0.4%			
ovarian torsion	1	0.4%			
portal venous air	2	0.7%			
pseudoobstruction	1	0.4%			
sigmoid volvulus	2	0.7%			
slipped laparoscopic band	1	0.4%			
small bowel ileus	4	1.4%			
small bowel obstruction (adhesion, tumour)	42	14.8%			
stercoral perforation	6	2.1%			
tumour (oesophagus/gastric)	1	0.4%			
tumour (colorectal, small bowel, appendix)	22	7.8%			
No response	1	0.4%			
GYNAECOLOGICAL					
gynaecolo unspecified	2	0.7%			
Ovarian/uterine/vulval mass likely malignant, or ovarian cyst >5cm, or large fibroid >5cm	2	0.7%			
tuboovarian abscess	6	2.1%			

No response	1	0.4%			
uterine p	1	0.4%			
HEPATOBILIARY SPLEEN					
acute cholecystitis	3	1.1%			
INDETERMINATE REPORT					
No response	1	0.4%			
LUNG/CARDIAC					
pneumonic changes	1	0.4%			
primary or secondary malignancy in field of view	1	0.4%			
NORMAL					
normal	3	1.1%			
VASCULAR					
aneurysm leak (abdominal aorta/thoracic aorta)	1	0.4%			
arterial occlusion (SMA/IMA/aorta)	2	0.7%			
IVC/Splenic vein/SMV thrombus/portal vein thrombus	1	0.4%			
other large vessel aneurysm	1	0.4%			
other (please include details if not included in list)					
No response	1	0.4%			
NO RESPONSE					
No response	18	6.4%			
Grand Total	283	100.0%			
Q12c					
ADDITIONAL INCORRECT SECONDARY MAJOR DIAGNOSIS/ES IN PROVISIONAL REPORT					
Yes	15	5.3%			
No	41	14.5%			
No response	227	80.2%			
Grand Total	283	100.0%			
Q12d					
ADDITIONAL INCORRECT SECONDARY MINOR DIAGNOSIS/ES IN PROVISIONAL REPORT					
Yes	11	3.9%			
No	36	12.7%			
No response	236	83.4%			
Grand Total	283	100.0%			
Q12e					
ADDITIONAL SECONDARY INDETERMINATE REPORTING IN PROVISIONAL REPORT					
Yes	5	1.8%			
No	30	10.6%			
No response	248	87.6%			
Grand Total	283	100.0%			

Q13					
HOW WOULD YOU GRADE THE LEVEL OF DISCREPANCY? If 'minor', proceed straight to Q16; if 'major', proceed straight to Q14					
Major	132	46.6%			
Minor	151	53.4%			
Grand Total	283	100.0%			
Q14					
CT AUDITOR CLASSIFICATION					
Interpretation discrepancy - CT diagnosis not ordinarily expected to be made (understandable miss)	35	26.5%			
Interpretation discrepancy - CT diagnosis should be made most of the time	78	59.1%			
No response	19	14.4%			
Grand Total	132	100.0%			
Q15					
NATURE OF THE DISCREPANCY					
False negative	40	30.3%			
False positive	8	6.1%			
Indeterminate reporting	16	12.1%			
Misdiagnosis	50	37.9%			
No response	18	13.6%			
Grand Total	132	100.0%			
ADDENDUM CT REPORT/ PROVISIONAL CT REPORT					
Q16					
IS THERE EVIDENCE OF AN ADDENDUM REPORT? if 'no', proceed straight to Q32; if 'yes', proceed straight to Q17					
Yes	635	26.9%			
No	1728	73.1%			
Grand Total	2363	100.0%			
Q17					
NATURE OF THE TRUST CONSULTANT RADIOLOGIST ADDENDUM REPORTER					
General radiologist	442	69.6%			
General with GI interest (attends GI MDM)	28	4.4%			
GI radiology subspecialty interest (min 5 sessions per week)	144	22.7%			
No response	21	3.3%			
Grand Total	635	100.0%			

FINDINGS OF ADDENDUM CT REPORT Select the most single and pertinent diagnosis (may include 'normal' or 'other') from 'site relating to major diagnosis' and/ or 'minor diagnosis'. Note.- If 'normal', this MUST be entered in 'site relating to major diagnosis' AND 'minor diagnosis'					
Q18					
SITE RELATING TO 'MAJOR DIAGNOSIS' If 'other', proceed straight to Q19b. Leave blank if no major diagnosis					
bowel mesentery nodal related	557	87.7%			
gynaecological	10	1.6%			
hepatobiliary spleen	15	2.4%			
indeterminate report	3	0.5%			
lung/cardiac	2	0.3%			
normal	7	1.1%			
pancreas	1	0.2%			
vascular	23	3.6%			
other	5	0.8%			
No response	12	1.9%			
Grand Total	635	100.0%			
Q19a					
MAJOR DIAGNOSIS Leave blank if no major diagnosis					
BOWEL MESENTERY NODAL RELATED					
abdo. wall haematoma/abscess	4	0.6%			
abdo. wall hernia/mass	6	0.9%			
acute diverticulitis	3	0.5%			
anastomotic leak	14	2.2%			
appendicitis (uncomplicated)	86	13.5%			
appendix mass, mucocele, abscess	17	2.7%			
bowel foreign body	1	0.2%			
caecal volvulus	4	0.6%			
closed loop small bowel obstruction	7	1.1%			
colitis (infective, ulcerative, pseudomenbranous)	12	1.9%			
colonic stricture	3	0.5%			
Crohns (small bowel/large bowel)	2	0.3%			
diverticular abscess	4	0.6%			
diverticular perforation	34	5.4%			
focal abscess (abdomen/pelvis)	14	2.2%			
focal bleeding point (small bowel/large bowel/stomach bilary/other)	2	0.3%			

free intraperitoneal air (perforation of oesophagus, stomach, duodenum, small bowel, colon, appendix)	64	10.1%			
free intraperitoneal air (site of perforation not seen)	41	6.5%			
gallbladder perforation	1	0.2%			
gallstone ileus	8	1.3%			
infective ileitis	5	0.8%			
internal herina (bariatric cases Peterson's hernia)	1	0.2%			
intussusception	3	0.5%			
ischaemic bowel (small bowel/colon/stomach)	34	5.4%			
large bowel obstruction	19	3.0%			
lymphadenopathy (abdo, pelvis, other)	1	0.2%			
nonrotation, malrotation	2	0.3%			
omental/mesenteric tumour infiltration	4	0.6%			
omental infarction	1	0.2%			
ovarian torsion	1	0.2%			
portal venous air	1	0.2%			
pseudoobstruction	2	0.3%			
sigmoid volvulus	5	0.8%			
slipped laparoscopic band	1	0.2%			
small bowel ileus	5	0.8%			
small bowel obstruction (adhesion, tumour)	114	18.0%			
stercoral perforation	4	0.6%			
tumour (colorectal, small bowel, appendix)	27	4.3%			
GYNAECOLOGICAL					
gynaecolo unspecified	4	0.6%			
tuboovarian abscess	6	0.9%			
HEPATOBILIARY SPLEEN					
acute cholecystitis	11	1.7%			
common bile duct calculus	1	0.2%			
gallbladder empyema	1	0.2%			
ruptured spleen with intraperitoneal blood	1	0.2%			
spontaneous bilary leak or biloma	1	0.2%			
INDETERMINATE REPORT					
No response	3	0.5%			
LUNG/CARDIAC					
pneumonic changes	1	0.2%			
primary or secondary malignancy in field of view	1	0.2%			
NORMAL					
normal	7	1.1%			
PANCREAS					
pancreatic abscess	1	0.2%			

VASCULAR					
aneurysm leak (abdominal aorta/thoracic aorta)	11	1.7%			
aortic aneurysm > 5cm	1	0.2%			
arterial occlusion (SMA/IMA/aorta)	2	0.3%			
IVC/Splenic vein/SMV thrombus/portal vein thrombus	2	0.3%			
muscle wall/rectus sheath haematoma	1	0.2%			
intra abdominal/pelvic/retroperitoneal haematoma (moderate/large)	6	0.9%			
other (please include details if not included in list)					
No response	5	0.8%			
NO RESPONSE					
No response	12	1.9%			
Grand Total	635	100.0%			
Q21					
IS THERE CONCORDANCE OF THE ADDENDUM REPORT WITH PROVISIONAL REPORT FINDINGS? If 'yes', proceed straight to Q25; if 'no', proceed straight to Q22					
Yes	537	84.6%			
No	98	15.4%			
Grand Total	635	100.0%			
Q22					
HOW WOULD YOU GRADE THE LEVEL OF DISCREPANCY? If 'minor', proceed straight to Q25; if 'major', proceed straight to Q23					
Major	54	55.1%			
Minor	44	44.9%			
Grand Total	98	100.0%			
Q23					
CT AUDITOR CLASSIFICATION					
Interpretation discrepancy - CT diagnosis not ordinarily expected to be made (understandable miss)	12	22.2%			
Interpretation discrepancy - CT diagnosis should be made most of the time	32	59.3%			
No response	10	18.5%			
Grand Total	54	100.0%			
Q24					
NATURE OF THE DISCREPANCY					
False negative	22	40.7%			
False positive	2	3.7%			
Indeterminate reporting	2	3.7%			
Misdiagnosis	19	35.2%			

No response	9	16.7%			
Grand Total	54	100.0%			
CT AUDITOR REVIEW/ ADDENDUM CT REPORT					
Q25					
ON CT AUDITOR REVIEW, IS THERE CONCORDANCE WITH ADDENDUM CT REPORT FINDINGS? If 'yes', proceed straight to Q32; if 'no', proceed straight to Q26					
Yes	582	91.7%			
No	53	8.3%			
Grand Total	635	100.0%			
Q26					
Major	17	32.1%			
Minor	36	67.9%			
Grand Total	53	100.0%			
Q27					
CT AUDITOR CLASSIFICATION					
Interpretation discrepancy - CT diagnosis not ordinarily expected to be made (understandable miss)	7	41.2%			
Interpretation discrepancy - CT diagnosis should be made most of the time	7	41.2%			
No response	3	17.6%			
Grand Total	17	100.0%			
Q28					
NATURE OF THE DISCREPANCY					
False negative	4	23.5%			
False positive	1	5.9%			
Indeterminate reporting	2	11.8%			
Misdiagnosis	8	47.1%			
No response	2	11.8%			
Grand Total	17	100.0%			
Q29					
ADDITIONAL INCORRECT SECONDARY MAJOR DIAGNOSIS/ES IN ADDENDUM REPORT					
Yes	1	5.9%			
No	1	5.9%			
No response	15	88.2%			
Grand Total	17	100.0%			

Q30					
ADDITIONAL INCORRECT SECONDARY MINOR DIAGNOSIS/ES IN ADDENDUM REPORT					
No	2	11.8%			
No response	15	88.2%			
Grand Total	17	100.0%			
Q31					
ADDITIONAL SECONDARY INDETERMINATE REPORTING IN ADDENDUM REPORT					
No	2	11.8%			
No response	15	88.2%			
Grand Total	17	100.0%			
LAPAROTOMY FINDINGS/ PROVISIONAL CT REPORT/ ADDENDUM CT REPORT					
Q32					
WHAT WAS THE TIME INTERVAL BETWEEN CT AND LAPAROTOMY?					
<12hours	1151				
12-24 hours	672				
>24 hours (up to 48 hours)	177				
>48 hours (up to 5 days)	141				
>5 days (up to 10 days)	85				
>10days	79				
No response	58				
Grand Total	2363				
Q33					
PROVISIONAL CT REPORT AVAILABLE PRE LAPAROTOMY?					
Yes - on PACS/ RIS	1990	84.2%			
Yes - written evidence in notes	207	8.8%			
No documented evidence	37	1.6%			
No response	129	5.5%			
Grand Total	2363	100.0%			
Q34					
ADDENDUM CT (IF UNDERTAKEN) REPORT AVAILABLE PRE LAPAROTOMY?					
Yes - on PACS/ RIS	342	53.9%			
Yes - written evidence in notes	14	2.2%			
No documented evidence	198	31.2%			
No response	81	12.8%			
Grand Total	635	100.0%			

LAPAROTOMY FINDINGS FROM PATIENT RECORD Select the most single and pertinent diagnosis (may include 'normal' or 'other') from 'site relating to major diagnosis' and/ or 'minor diagnosis'. Note.- If 'normal', this MUST be entered in 'site relating to major diagnosis' AND 'minor diagnosis'					
Q35					
SITE RELATING TO 'MAJOR DIAGNOSIS' If 'other', proceed straight to Q36b. Leave blank if no major diagnosis					
bowel mesentery nodal related	2057	87.1%			
gynaecological	55	2.3%			
hepatobiliary spleen	79	3.3%			
indeterminate report	1	0.0%			
normal	22	0.9%			
pancreas	8	0.3%			
renal tract	8	0.3%			
vascular	58	2.5%			
other (please include details if not included in list)	13	0.6%			
No response	62	2.6%			
Grand Total	2363	100.0%			
Q36a					
MAJOR DIAGNOSIS Leave blank if no major diagnosis					
BOWEL MESENTERY NODAL RELATED					
abdo. wall haematoma/abscess	10	0.4%			
abdo. wall hernia/mass	14	0.6%			
acute diverticulitis	8	0.3%			
anastomotic leak	52	2.2%			
appendicitis (uncomplicated)	251	10.6%			
appendix mass, mucocele, abscess	115	4.9%			
bariatric complication (pouch dilatation, roux loop obstruction, gastrogastric fistula)	1	0.0%			
bladder perforation	7	0.3%			
bowel foreign body	1	0.0%			
caecal volvulus	27	1.1%			
closed loop small bowel obstruction	39	1.7%			
colitis (infective, ulcerative, pseudomenbranous)	30	1.3%			
colonic stricture	14	0.6%			
Crohns (small bowel/large bowel)	16	0.7%			
diverticular abscess	32	1.4%			
diverticular perforation	111	4.7%			

extensive/moderate ascites	4	0.2%			
fistula (small bowel, large bowel, other)	1	0.0%			
focal abscess (abdomen/pelvis)	49	2.1%			
focal bleeding point (small bowel/large bowel/stomach bilary/other)	11	0.5%			
free intraperitoneal air (perforation of oesophagus, stomach, duodenum, small bowel, colon, appendix)	313	13.2%			
free intraperitoneal air (site of perforation not seen)	29	1.2%			
gallbladder perforation	3	0.1%			
gallstone ileus	14	0.6%			
gastric volvulus/distension	3	0.1%			
infective ileitis	4	0.2%			
internal herina (bariatric cases Peterson's hernia)	21	0.9%			
intussusception	8	0.3%			
ischaemic bowel (small bowel/colon/stomach)	109	4.6%			
large bowel obstruction	87	3.7%			
lymphadenopathy (abdo, pelvis, other)	3	0.1%			
nonrotation, malrotation	2	0.1%			
omental/mesenteric tumour infiltration	6	0.3%			
omental infarction	7	0.3%			
ovarian torsion	5	0.2%			
pseudoobstruction	5	0.2%			
sigmoid volvulus	14	0.6%			
slipped laparoscopic band	1	0.0%			
small bowel lymphoma	6	0.3%			
small bowel ileus	17	0.7%			
small bowel obstruction (adhesion, tumour)	448	19.0%			
splenic abscess	1	0.0%			
stercoral perforation	24	1.0%			
tumour (oesophagus/gastric)	1	0.0%			
tumour (colorectal, small bowel, appendix)	126	5.3%			
No response	7	0.3%			
GYNAECOLOGICAL					
gynaecolo unspecified	19	0.8%			
Ovarian/uterine/vulval mass likely malignant, or ovarian cyst >5cm, or large fibroid >5cm	3	0.1%			
tuboovarian abscess	26	1.1%			
No response	5	0.2%			
uterine p	2	0.1%			
HEPATOBILIARY SPLEEN					
acute cholecystitis	35	1.5%			

bile duct dilatation (moderate/severe, no pmh cholecystectomy)	2	0.1%			
common bile duct calculus	2	0.1%			
gallbladder empyema	16	0.7%			
liver laceration/haematoma/contusion	2	0.1%			
liver abscess	1	0.0%			
ruptured spleen with intraperitoneal blood	11	0.5%			
spontaneous bilary leak or biloma	9	0.4%			
No response	1	0.0%			
INDETERMINATE REPORT					
No response	1	0.0%			
NORMAL					
normal	22	0.9%			
PANCREAS					
acute pancreatitis	4	0.2%			
pancreatic tumour	1	0.0%			
pancreatic abscess	3	0.1%			
RENAL TRACT					
bladder mass likely malignant	1	0.0%			
colovesical fistula	1	0.0%			
hydro/pyonephrosis (moderate/severe)	1	0.0%			
renal tract calculus, complicated (eg obstructing)	2	0.1%			
renal tumour likely malignant	2	0.1%			
No response	1	0.0%			
VASCULAR					
aneurysm leak (abdominal aorta/thoracic aorta)	26	1.1%			
aortic aneurysm > 5cm	4	0.2%			
aortic dissection	1	0.0%			
arterial occlusion (SMA/IMA/aorta)	2	0.1%			
muscle wall/rectus sheath haematoma	3	0.1%			
other large vessel aneurysm	4	0.2%			
intra abdominal/pelvic/retroperitoneal haematoma (moderate/large)	18	0.8%			
OTHER					
No response	13	0.6%			
NO RESPONSE					
No response	62	2.6%			
Grand Total	2363	100.0%			
Q38					
DID PROVISIONAL CT REPORT CORRELATE WITH LAPAROTOMY FINDINGS?					
Yes	1986	84.0%			

No	324	13.7%			
No response	53	2.2%			
Grand Total	2363	100.0%			
Q39					
DID ADDENDUM CT REPORT (IF AVAILABLE) CORRELATE WITH LAPAROTOMY FINDINGS?					
Yes	554	87.2%			
No	81	12.8%			
Grand Total	635	100.0%			
CONCLUSION					
Q40					
OVERALL, HOW WOULD YOU CODE THIS PATIENT?					
Major discrepancy and patient came to harm	36	1.5%			
Major discrepancy and patient did not come to harm	87	3.7%			
Major discrepancy patient outcome unclear	11	0.5%			
Minor discrepancy	162	6.9%			
No issues with report	2042	86.4%			
No response	25	1.1%			
Grand Total	2363	100.0%			
Q41a					
IN CASES OF MAJOR DISCREPANCY, IF A PATIENT CAME TO HARM, WHAT WAS THE NATURE OF THE HARM?					
Delay in diagnosis	3	8.3%			
Delay in surgery	24	66.7%			
Unnecessary intervention	1	2.8%			
Unnecessary surgery	8	22.2%			
Grand Total	36	100.0%			

Appendix B: Overview of data

1.1 Non-Surgical Data:

Total number of observations 2,568. 1,947 have no addendum, 621 have an addendum.

1.1.1 No addendum (N=1,947)

i) Provisional and Auditor agree 1,782
ii) Provisional and Auditor disagree 165 (37 Major, 128 Minor). Of 37 Major, 9 came to harm, 22 no harm, 6 unclear.

1.1.2 With addendum (N=621)

i) Provisional, Auditor and Addendum all agree 472.
ii) Provisional, Auditor and Addendum all disagree 13 (4 Major, 9 Minor). Of 4 Major, 2 came to harm, 2 no harm.
iii) Auditor agrees with Addendum, not with Provisional 75 (19 Major, 56 Minor). Of 19 Major, 1 came to harm, 13 no harm, 5 unclear.
iv) Auditor agrees with Provisional, not with Addendum 26 (3 Major, 23 Minor). Of 3 Major all came to no harm.
v) Provisional agrees with Addendum, not with Auditor 35 (12 Major, 23 Minor). Of 12 Major, 3 came to harm, 6 no harm, 3 unclear.

1.2 Surgical Data

Total number of observations 2,363. 1,728 have no addendum, 635 have an addendum.

1.2.1 No addendum (N=1,728)

i) Provisional and Auditor agree 1,557

a) Also agree with laparotomy 1,423
b) Laparotomy "no response" 50
c) Disagree with laparotomy 84

ii) Provisional and Auditor disagree 171 (72 Major, 99 Minor). Of 72 Major, 20 came to harm, 45 no harm, 7 unclear.

a) Provisional agrees with laparotomy 65 (1 Major came to harm, 7 Major no harm, 1 Major unclear whether there was harm, 56 Minor)

b) Laparotomy “no response” 3 (3 Minor)

c) Provisional disagrees with laparotomy 103 (19 Major came to harm, 38 Major no harm, 6 Major unclear whether there was harm, 40 Minor)

1.2.2 With addendum (N=635)

i) Provisional, Auditor and Addendum all agree 510

a) Also agree with laparotomy 471
b) Disagree with laparotomy 39

ii) Provisional, Auditor and Addendum all disagree 13 (7 all three discrepancies coded as Major, 6 all coded as Minor). Of 7 Major, 1 came to harm, 6 no harm.

a) Addendum agrees with laparotomy, Provisional doesn't 2 (2 Minor)
b) Provisional agrees with laparotomy, Addendum doesn't 1 (1 Minor)
c) Neither agrees with laparotomy 10 (1 Major came to harm, 6 Major no harm, 3 Minor)

iii) Auditor agrees with Addendum, not with Provisional 72 (45 Major, 27 Minor). Of 45 Major, 13 came to harm, 28 no harm, 4 unclear.

a) Addendum agrees with laparotomy, Provisional doesn't 65 (12 Major came to harm, 27 Major no harm, 3 Major unclear whether came to harm, 23 Minor)
b) Provisional agrees with laparotomy, Addendum doesn't 1 (1 Major unclear whether came to harm)
c) Neither agrees with laparotomy 2 (1 Major came to harm, 1 Major no harm)
d) Both agree with laparotomy 4 (4 Minor)

iv) Auditor agrees with Provisional, not with Addendum 13 (2 Major, 11 Minor). Both Major, came to no harm.

a) Provisional agrees with laparotomy, Addendum doesn't 9 (2 Major didn't come to harm, 7 Minor)
b) Neither agrees with laparotomy 2 (2 Minor)
c) Both agree with laparotomy 2 (2 Minor)

v) Provisional agrees with Addendum, not with Auditor 27 (8 Major, 19 Minor). Of 8 Major, 2 came to harm, 6 no harm.

a) Neither Provisional or Addendum agrees with laparotomy 17 (2 Major came to harm, 4 Major no harm, 11 Minor)
b) Both agree with laparotomy 10 (2 Major no harm, 8 Minor)

Appendix C: Full Statistical Analysis

Section 1: Predictors of provisional agreement with auditor

Risk ratios (95% CI) estimated from a generalised linear model with a binary outcome and log link, with robust standard errors that allow for non-independence of outcomes from the same hospital.

1.1 Consultant, Registrar, Offsiter comparisons:

1.1.1 Non-Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
Consultant	1471	1338 (91.0)	97 (6.6)	36 (2.4)	133 (9.0)	1	1
Registrar	887	767 (86.5)	95 (10.7)	25 (2.8)	120 (13.5)	1.15 (0.65, 2.03)	1.50 (1.10, 2.03)
Offsiter	210	175 (83.3)	24 (11.4)	11 (5.2)	35 (16.7)	2.14 (1.01, 4.54)	1.84 (1.29, 2.63)
Total	2568	2280 (88.8)	216 (8.4)	72 (2.8)	288 (11.2)	p = 0.12	p = 0.0015

Higher risk of discrepancy observed for Offsiters than for Registrars and Consultants. For major discrepancies a joint test of differences amongst the three groups is not statistically significant, although a pairwise comparison of the risk in Offsiters with that in Consultants is statistically significant (as indicated by the fact that the 95% CI for the Risk ratio in question excludes 1).

For all discrepancies the joint test of differences is highly statistically significant, as are the pairwise comparisons between Offsiters and Consultants and between Registrars and Consultants.

1.1.2 Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
Consultant	1263	1141 (90.3)	73 (5.8)	49 (3.9)	122 (9.7)	1	1
Registrar	882	772 (87.5)	54 (6.1)	56 (6.3)	110 (12.5)	1.64 (0.98, 2.74)	1.29 (0.92, 1.81)
Offsiter	181	140 (77.3)	18 (9.9)	23 (12.7)	41 (22.7)	3.28 (1.84, 5.84)	2.35 (1.61, 3.41)
						p = 0.0003	p < 0.0001
No response	37	27 (73.0)	6 (16.2)	4 (10.8)	10 (27.0)		
Total	2363	2080 (88.0)	151 (6.4)	132 (5.6)	283 (12.0)		

1.1.3 Interaction tests between discrepancy risk ratios

Statistical tests for interaction: Major Discrepancy p = 0.36; Any Discrepancy p = 0.29. No evidence that the magnitude of the Discrepancy risk ratios differ between surgical and non-surgical groups. So no evidence that results from the two groups cannot be pooled.

1.1.4 Pooled Results

	Discrepancy Risk Ratio (95% CI)	
	Major	Any
Surgical v Non-Surgical	1.96 (1.44, 2.67), p < 0.0001	1.04 (0.84, 1.29), p = 0.71
Registrar v Consultant	1.44 (0.95, 2.18)	1.39 (1.09, 1.77)
Offsiter v Consultant	2.81 (1.75, 4.51)	2.09 (1.56, 2.79)
	p = 0.0001	p < 0.0001

Strong evidence that the risks of major discrepancy are greater in the Surgical than the Non-Surgical group. No such evidence for all discrepancies. Strong evidence of differences in discrepancy rates between the three groups with Offsiters having the highest risks and Registrars risks that are intermediate between those for Offsiters and Consultants.

1.1.5 Non-Surgical Data, restricting to major discrepancies with harm

	Total	Major Discrepancy with harm N (%)	Discrepancy Risk Ratio (95% CI)
Consultant	1471	6 (0.4)	1
Registrar	887	6 (0.7)	1.66 (0.52, 5.33)
Offsiter	210	3 (1.4)	3.50 (0.85, 14.51)
Total	2568	15 (0.6)	p=0.22

1.1.6 Surgical Data, restricting to major discrepancies with harm

	Total	Major Discrepancy with harm N (%)	Discrepancy Risk Ratio (95% CI)
Consultant	1263	15 (1.2)	1
Registrar	882	13 (1.5)	1.24 (0.55, 2.80)
Offsiter	181	6 (3.3)	2.79 (0.80, 9.73)
			P=0.27
No response	37	2 (5.4)	
Total	2363	36 (1.5)	

1.1.7 Pooled Results, restricting to major discrepancies with harm

	Discrepancy Risk Ratio (95% CI)
Surgical v Non-Surgical	2.49 (1.32, 4.73), p = 0.005
Registrar v Consultant	1.35 (0.69, 2.67), p = 0.38
Offsiter v Consultant	2.99 (1.21, 7.42), p=0.018
	p = 0.061

Restricting to major discrepancies with harm the magnitude of the risk ratios remain very similar, but 95% confidence intervals get wider and differences less statistically significant. Globally the comparison between the

three groups is only of borderline statistical significance (p=0.061), but the pairwise comparison of Offsiters with Consultants is formally statistically significant (p=0.018).

1.2 Impact of Registrar Discussion:

1.2.1 Non-Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
No discussion	708	620 (87.6)	69 (9.7)	19 (2.7)	88 (12.4)	1	1
With discussion	179	147 (82.1)	26 (14.5)	6 (3.4)	32 (17.9)	1.25 (0.41, 3.84)	1.44 (0.92, 2.25)
Registrar	887	767 (86.5)	95 (10.7)	25 (2.8)	120 (13.5)	p = 0.70	p = 0.11

1.2.2 Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
No discussion	703	613 (87.2)	43 (6.1)	47 (6.7)	90 (12.8)	1	1
With discussion	179	159 (88.8)	11 (6.1)	9 (5.0)	20 (11.2)	0.75 (0.31, 1.83)	0.87 (0.45, 1.71)
Registrar	882	772 (87.5)	54 (6.1)	56 (6.3)	110 (12.5)	p = 0.53	p = 0.69

1.2.3 Interaction tests between discrepancy risk ratios

Tests for interaction: Major Discrepancy p = 0.35; Any Discrepancy p = 0.19.

1.2.4 Pooled Results

	Discrepancy Risk Ratio (95% CI)	
	Major	Any
Surgical v Non-Surgical	2.25 (1.28, 3.96), p = 0.0048	0.92 (0.66, 1.28), p = 0.62
Discussion v None	0.89 (0.39, 2.06), p = 0.79	1.15 (0.78, 1.70), p = 0.47

No evidence of differences here.

1.3 Effect of Consultant Type:

1.3.1 Non-Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
General	1028	923 (89.8)	75 (7.3)	30 (2.9)	105 (10.2)	1	1
GI interest	146	137 (93.8)	8 (5.5)	1 (0.7)	9 (6.2)	0.23 (0.03, 1.82)	0.60 (0.27, 1.35)
Subspeciality	275	256 (93.1)	14 (5.1)	5 (1.8)	19 (6.9)	0.62 (0.18, 2.14)	0.68 (0.39, 1.18)
						p = 0.31	p=0.20
Specialist (combined)	421	393 (93.3)	22 (5.2)	6 (1.4)	28 (6.7)	0.49 (0.16, 1.50) p = 0.21	0.65 (0.41, 1.04) p = 0.073
Unspecified	22	22 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)		
Consultant	1471	1338 (91.0)	97 (6.6)	36 (2.4)	133 (9.0)		

1.3.2 Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
General	876	783 (89.4)	58 (6.6)	35 (4.0)	93 (10.6)	1	1
GI interest	128	119 (93.0)	5 (3.9)	4 (3.1)	9 (7.0)	0.78 (0.38, 1.62)	0.66 (0.36, 1.23)
Subspeciality	259	239 (92.3)	10 (3.9)	10 (3.9)	20 (7.7)	0.97 (0.48, 1.93)	0.73 (0.42, 1.27)
						p = 0.80	p = 0.27
Specialist (combined)	387	358 (92.5)	15 (3.9)	14 (3.6)	29 (7.5)	0.91 (0.52, 1.56) p = 0.72	0.71 (0.45, 1.11) p=0.13
Consultant	1263	1141 (90.3)	73 (5.8)	49 (3.9)	122 (9.7)		

1.3.3 Interaction tests between discrepancy risk ratios

Tests for interaction (three categories): Major Discrepancy p = 0.46; Any Discrepancy p = 0.97. With a single specialist category: Major Discrepancy p = 0.33; Any Discrepancy p = 0.80

1.3.4 Pooled Results (3 categories)

	Discrepancy Risk Ratio (95% CI)	
	Major	Any
Surgical v Non-Surgical	1.57 (1.04, 2.36), p = 0.032	1.06 (0.78, 1.43), p = 0.72
GI interest v General	0.53 (0.26, 1.11)	0.63 (0.37, 1.07)
Subspeciality v General	0.81 (0.45, 1.49)	0.70 (0.47, 1.05)
	p = 0.22	p = 0.064

Some evidence that risks differ between the groups, with the highest rates in the General group, but differences are not formally statistically significant.

Pooled Results (2 categories)

	Discrepancy Risk Ratio (95% CI)	
	Major	Any
Surgical v Non-Surgical	1.57 (1.04, 2.36), p = 0.031	1.06 (0.78, 1.43), p = 0.71
Specialist v General	0.72 (0.43, 1.21), p = 0.21	0.68 (0.49, 0.95), p = 0.022

Some evidence that risks differ between the groups, with the highest rates in the General group, but differences are only formally statistically significant for any discrepancy.

1.4 Institutional comparisons:

Here, and subsequently, analyses are carried out with and without adjustment for imbalances in the numbers of Registrars, Consultants and Offsiters between institutions.

1.4.1 Non-Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
DGH	1777	1597 (89.9)	129 (7.3)	51 (2.9)	180 (10.1)	1	1
Teaching	791	683 (86.3)	87 (11.0)	21 (2.7)	108 (13.7)	0.93 (0.51, 1.69) 0.85* (0.36, 1.97)*	1.35 (0.94, 1.92) 1.16* (0.75, 1.80)
Total	2568	2280 (88.8)	216 (8.4)	72 (2.8)	288 (11.2)	p = 0.80 p = 0.70*	p = 0.10 p = 0.51*

*With adjustment for Registrar, Consultant, Offsiter imbalances.

1.4.2 Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
DGH	1638	1455 (88.8)	99 (6.0)	84 (5.1)	183 (11.2)	1	1
Teaching	725	625 (86.2)	52 (7.2)	48 (6.6)	100 (13.8)	1.29 (0.77, 2.15) 1.12* (0.67, 1.85)	1.23 (0.87, 1.75) 1.22* (0.84, 1.78)
Total	2363	2080 (88.0)	151 (6.4)	132 (5.6)	283 (12.0)	p = 0.33 p = 0.67*	p = 0.24 p = 0.29*

*With adjustment for Registrar, Consultant, Offsiter imbalances.

1.4.3 Interaction tests between discrepancy risk ratios

Tests for interaction: Major Discrepancy p = 0.36 (p = 0.34 with adjustment for Registrar, Consultant, Offsiter imbalances); Any Discrepancy p = 0.72 (p = 0.78 with adjustment for Registrar, Consultant, Offsiter imbalances).

1.4.4 Pooled Results

	Discrepancy Risk Ratio (95% CI)		Discrepancy Risk Ratio (95% CI) With adjustment for Registrar, Consultant, Offsiter imbalances	
	Major	Any	Major	Any
Surgical v Non-Surgical	1.99 (1.46, 2.73) p < 0.0001	1.07 (0.85, 1.34) p = 0.57	1.96 (1.44, 2.67) p < 0.0001	1.04 (0.84, 1.30) p = 0.70
Teaching v DGH	1.16 (0.75, 1.78) p = 0.51	1.29 (0.99, 1.68) p = 0.057	1.02 (0.62, 1.69) p = 0.94	1.20 (0.87, 1.64) p = 0.27

No strong evidence of differences here.

1.5 Effect of Availability of On-call CT reporting by Registrar:

1.5.1 Non-Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
Absent	1126	1021 (90.7)	81 (7.2)	24 (2.1)	105 (9.3)	1	1
Present	1442	1259 (87.3)	135 (9.4)	48 (3.3)	183 (12.7)	1.56 (0.84, 2.89) 1.87* (0.93, 3.74)*	1.36 (0.93, 1.99) 1.20* (0.79, 1.83)
Total	2568	2280 (88.8)	216 (8.4)	72 (2.8)	288 (11.2)	p = 0.16 p = 0.078*	p = 0.11 p = 0.40*

*With adjustment for Registrar, Consultant, Offsiter imbalances.

1.5.2 Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
Absent	946	848 (89.6)	61 (6.4)	37 (3.9)	98 (10.4)	1	1
Present	1417	1232 (86.9)	90 (6.4)	95 (6.7)	185 (13.1)	1.71 (1.05, 2.80) 1.71* (1.03, 2.84)	1.26 (0.88, 1.81) 1.19* (0.83, 1.69)
Total	2363	2080 (88.0)	151 (6.4)	132 (5.6)	283 (12.0)	p = 0.032 p = 0.039*	p = 0.21 p = 0.35*

*With adjustment for Registrar, Consultant, Offsiter imbalances.

1.5.3 Interaction tests between discrepancy risk ratios

Tests for interaction: Major Discrepancy p = 0.78 (p = 0.83 with adjustment for Registrar, Consultant, Offsiter imbalances); Any Discrepancy p = 0.75 (p = 0.57 with adjustment for Registrar, Consultant, Offsiter imbalances).

1.5.4 Pooled Results

	Discrepancy Risk Ratio (95% CI)		Discrepancy Risk Ratio (95% CI) With adjustment for Registrar, Consultant, Offsiter imbalances	
	Major	Any	Major	Any
Surgical v Non-Surgical	1.96 (1.43, 2.67) p < 0.0001	1.06 (0.84, 1.32) p = 0.63	1.94 (1.42, 2.65) p < 0.0001	1.04 (0.84, 1.29) p = 0.73
Present v Absent	1.66 (1.07, 2.57) p = 0.024	1.31 (0.98, 1.75) p = 0.068	1.76 (1.09, 2.84) p = 0.021	1.19 (0.88, 1.63) p = 0.26

Some evidence that risks of major discrepancy are higher when On-call CT is present.

1.6 Effect of Availability of On-call CT reporting by Consultant:

1.6.1 Non-Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
Fully Available	1502	1349 (89.8)	118 (7.9)	35 (2.3)	153 (10.2)	1	1
Partially Available	816	714 (87.5)	74 (9.1)	28 (3.4)	102 (12.5)	1.47 (0.78, 2.79) 1.34* (0.74, 2.40)	1.23 (0.84, 1.79) 1.12 (0.77, 1.62)
Absent	250	217 (86.8)	24 (9.6)	9 (3.6)	33 (13.2)	1.54 (0.73, 3.28) 1.26* (0.53, 2.98)	1.30 (0.83, 2.02) 0.99 (0.62, 1.58)
Total	2568	2280 (88.8)	216 (8.4)	72 (2.8)	288 (11.2)	p = 0.35 p = 0.59*	p = 0.41 p = 0.79*

1.6.2 Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
Fully Available	1383	1235 (89.3)	95 (6.9)	53 (3.8)	148 (10.7)	1	1
Partially Available	772	664 (86.0)	46 (6.0)	62 (8.0)	108 (14.0)	2.10 (1.27, 3.45) 1.86* (1.12, 3.09)	1.31 (0.91, 1.88) 1.18 (0.83, 1.68)
Absent	208	181 (87.0)	10 (4.8)	17 (8.2)	27 (13.0)	2.13 (1.00, 4.54) 1.67* (0.80, 3.48)	1.21 (0.70, 2.11) 0.99 (0.59, 1.67)
Total	2363	2080 (88.0)	151 (6.4)	132 (5.6)	283 (12.0)	p = 0.0093 p = 0.048*	p = 0.34 p = 0.62*

1.6.3 Interaction tests between discrepancy risk ratios

Tests for interaction: Major Discrepancy p = 0.56 (p = 0.45 with adjustment for Registrar, Consultant, Offsiter imbalances); Any Discrepancy p = 0.94 (p = 0.92 with adjustment for Registrar, Consultant, Offsiter imbalances).

1.6.4 Pooled Results

	Discrepancy Risk Ratio (95% CI)		Discrepancy Risk Ratio (95% CI) With adjustment for Registrar, Consultant, Offsiter imbalances	
	Major	Any	Major	Any
Surgical v Non-Surgical	2.00 (1.46, 2.74) p < 0.0001	1.07 (0.85, 1.34) p = 0.57	1.95 (1.43, 2.67) p < 0.0001	1.04 (0.84, 1.29) p = 0.74
Partially v Fully Available	1.85 (1.20, 2.88)	1.27 (0.95, 1.68)	1.66 (1.07, 2.56)	1.15 (0.87, 1.51)
Absent v Fully Available	1.90 (1.06, 3.39)	1.26 (0.99, 1.59)	1.49 (0.82, 2.71)	0.98 (0.76, 1.27)
	p = 0.011	p = 0.13	p = 0.066	p=0.43

Evidence of differences in major discrepancy risks amongst the three groups with the discrepancy risks lowest when on-call CT reporting by Consultant is fully available. The differences between the groups are only borderline statistically significant once adjustment for differences in numbers of Consultants, Registrars and Offsiters is carried out.

1.7 Effect of On-call CT reporting by offsite non-Trust Radiologist:

1.7.1 Non-Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
On-site	1723	1533 (89.0)	150 (8.7)	40 (2.3)	190 (11.0)	1	1
Off-site	845	747 (88.4)	66 (7.8)	32 (3.8)	98 (11.6)	1.63 (0.91, 2.92) 1.55* (0.78, 3.08)*	1.05 (0.73, 1.52) 1.03* (0.68, 1.56)
Total	2568	2280 (88.8)	216 (8.4)	72 (2.8)	288 (11.2)	p = 0.10 p = 0.21*	p = 0.79 p = 0.88*

*With adjustment for Registrar, Consultant, Offsiter imbalances.

1.7.2 Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
On-site	1572	1416 (90.1)	83 (5.3)	73 (4.6)	156 (9.9)	1	1
Off-site	791	664 (83.9)	68 (8.6)	59 (7.5)	127 (16.1)	1.61 (1.00, 2.57) 1.34* (0.75, 2.37)	1.62 (1.16, 2.27) 1.40* (0.94, 2.07)
Total	2363	2080 (88.0)	151 (6.4)	132 (5.6)	283 (12.0)	p = 0.049 p = 0.32*	p = 0.005 p = 0.095*

*With adjustment for Registrar, Consultant, Offsiter imbalances.

1.7.3 Interaction tests between discrepancy risk ratios

Tests for interaction: Major Discrepancy p = 0.96 (p = 0.81 with adjustment for Registrar, Consultant, Offsiter imbalances); Any Discrepancy p = 0.063 (p = 0.11 with adjustment for Registrar, Consultant, Offsiter imbalances).

1.7.4 Pooled Results

	Discrepancy Risk Ratio (95% CI)		Discrepancy Risk Ratio (95% CI) With adjustment for Registrar, Consultant, Offsiter imbalances	
	Major	Any	Major	Any
Surgical v Non-Surgical	1.99 (1.45, 2.72) p < 0.0001	1.07 (0.85, 1.34) p = 0.55	1.94 (1.42, 2.66) p < 0.0001	1.04 (0.84, 1.29) p = 0.73
Off v On-site	1.61 (1.06, 2.45) p = 0.025	1.31 (1.00, 1.72) p = 0.049	1.42 (0.85, 2.37) p = 0.18	1.20 (0.88, 1.64) p = 0.25

For major discrepancies some evidence that discrepancy risks are higher when reporting is off-site, but statistical significance is lost when adjustments for imbalance in numbers of Registrars, Consultants and Offsiters is made. Some suggestion that the pattern of results for any discrepancy differs between the surgical and non-surgical groups, however the Interaction tests between discrepancy risk ratios are not formally statistically significant.

1.8 Effect of Availability of Speciality GI Radiologist On-site:

1.8.1 Non-Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
Absent	1168	1045 (89.5)	92 (7.9)	31 (2.7)	123 (10.5)	1	1
Present	1400	1235 (88.2)	124 (8.9)	41 (2.9)	165 (11.8)	1.10 (0.62, 1.96) 1.17* (0.60, 2.27)*	1.12 (0.79, 1.59) 0.99* (0.68, 1.45)
Total	2568	2280 (88.8)	216 (8.4)	72 (2.8)	288 (11.2)	p = 0.74 p = 0.65*	p = 0.53 p = 0.97*

*With adjustment for Registrar, Consultant, Offsiter imbalances.

1.8.2 Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
Absent	1078	947 (87.8)	70 (6.5)	61 (5.7)	131 (12.2)	1	1
Present	1285	1133 (88.2)	81 (6.3)	71 (5.5)	152 (11.8)	0.98 (0.60, 1.58) 0.90* (0.56, 1.44)	0.97 (0.69, 1.38) 0.97* (0.68, 1.38)
Total	2363	2080 (88.0)	151 (6.4)	132 (5.6)	283 (12.0)	p = 0.92 p = 0.65*	p = 0.88 p = 0.87*

*With adjustment for Registrar, Consultant, Offsiter imbalances.

1.8.3 Interaction tests between discrepancy risk ratios

Tests for interaction: Major Discrepancy p = 0.70 (p = 0.70 with adjustment for Registrar, Consultant, Offsiter imbalances); Any Discrepancy p = 0.55 (p = 0.60 with adjustment for Registrar, Consultant, Offsiter imbalances).

1.8.4 Pooled Results

	Discrepancy Risk Ratio (95% CI)		Discrepancy Risk Ratio (95% CI) With adjustment for Registrar, Consultant, Offsiter imbalances	
	Major	Any	Major	Any
Surgical v Non-Surgical	1.99 (1.46, 2.72) p < 0.0001	1.07 (0.85, 1.34) p = 0.57	1.96 (1.44, 2.67) p < 0.0001	1.04 (0.84, 1.29) p = 0.71
Present v Absent	1.02 (0.67, 1.55) p = 0.93	1.04 (0.80, 1.36) p = 0.75	0.99 (0.63, 1.54) p = 0.95	0.99 (0.76, 1.27) p = 0.91

1.9 Effect of Routine onsite review of outsourced (non-Trust) CT on-call reports:

1.9.1 Non-Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
N/A	1723	1533 (89.0)	150 (8.7)	40 (2.3)	190 (11.0)	-	-
Absent	509	454 (89.2)	40 (7.9)	15 (2.9)	55 (10.8)	1	1
Present	336	293 (87.2)	26 (7.7)	17 (5.1)	43 (12.8)	1.72 (0.68, 4.35) 1.82* (0.77, 4.34)*	1.18 (0.64, 2.20) 1.25* (0.70, 2.23)
Total	2568	2280 (88.8)	216 (8.4)	72 (2.8)	288 (11.2)	p = 0.25 p = 0.17*	p = 0.59 p = 0.46*

*With adjustment for Registrar, Consultant, Offsiter imbalances.

1.9.2 Surgical Data

	Total	Agree N (%)	Disagree N (%)			Discrepancy Risk Ratio (95% CI)	
			Minor	Major	Total	Major	Any
N/A	1572	1416 (90.1)	83 (5.3)	73 (4.6)	156 (9.9)	-	-
Absent	459	372 (81.0)	51 (11.1)	36 (7.8)	87 (19.0)	1	1
Present	332	292 (88.0)	17 (5.1)	23 (6.9)	40 (12.0)	0.88 (0.46, 1.69) 0.93* (0.50, 1.74)	0.64 (0.36, 1.12) 0.67* (0.40, 1.14)
Total	2363	2080 (88.0)	151 (6.4)	132 (5.6)	283 (12.0)	p = 0.71 p = 0.83*	p = 0.11 p = 0.14*

*With adjustment for Registrar, Consultant, Offsiter imbalances.

1.9.3 Interaction tests between discrepancy risk ratios

Tests for interaction: Major Discrepancy p = 0.11 (p = 0.094 with adjustment for Registrar, Consultant, Offsiter imbalances); Any Discrepancy p = 0.096 (p = 0.081 with adjustment for Registrar, Consultant, Offsiter imbalances).

1.9.4 Pooled Results

	Discrepancy Risk Ratio (95% CI)		Discrepancy Risk Ratio (95% CI) With adjustment for Registrar, Consultant, Offsiter imbalances	
	Major	Any	Major	Any
Surgical v Non-Surgical	1.96 (1.27, 3.04) p = 0.003	1.40 (0.98, 1.99) p = 0.066	1.82 (1.17, 2.84) p = 0.008	1.30 (0.94, 1.81) p = 0.11
Present v Absent	1.11 (0.57, 2.16) p = 0.75	0.83 (0.53, 1.32) p = 0.44	1.18 (0.62, 2.24) p = 0.62	0.88 (0.58, 1.35) p = 0.56

Section 2: Impact of addendum

2.1 Predictors of addendum use:

2.1.1 Non-Surgical Data (N=621)

	Level of discrepancy between provisional and auditor	Total	Addendum
Consultant	None	1338	17 (1.3%)
	Minor	97	13 (13.4%)
	Major	36	9 (25.0%)
	Combined	1471	39 (2.7%)
Registrar	None	767	460 (60.0%)
	Minor	95	70 (73.7%)
	Major	25	19 (76.0%)
	Combined	887	549 (61.9%)
Offsiter	None	175	21 (12.0%)
	Minor	24	5 (20.8%)
	Major	11	7 (63.6%)
	Combined	210	33 (15.7%)

2.1.2 Surgical Data (N=635)

	Level of discrepancy between provisional and auditor	Total	Addendum
Consultant	None	1141	22 (1.9%)
	Minor	73	8 (11.0%)
	Major	49	12 (24.5%)
	Combined	1263	42 (3.3%)
Registrar	None	772	492 (63.7%)
	Minor	54	42 (77.8%)
	Major	56	42 (75.0%)
	Combined	882	576 (65.3%)
Offsiter	None	140	9 (6.4%)
	Minor	18	1 (5.6%)
	Major	23	6 (26.1%)
	Combined	181	16 (8.8%)

Addendum use is most common for Registrars and least common for consultants, Also in each group addendum use is more common when it turns out that there is discrepancy between provisional and auditor.

2.2 Impact of addendum use:

2.2.1 Non-Surgical Data (N=621)

i) Provisional, Auditor and Addendum all agree 472. No gain or loss if switch to addendum.

ii) Provisional, Auditor and Addendum all disagree 13 (4 Major (all discrepancies), 9 Minor). No gain or loss if switch to addendum.

iii) Auditor agrees with Addendum, not with Provisional 75 (19 Major, 56 Minor). Gain if switch to addendum.

iv) Auditor agrees with Provisional, not with Addendum 26 (3 Major, 23 Minor). Loss if switch to addendum.

v) Provisional agrees with Addendum, not with Auditor 35 (12 Major, 23 Minor). No gain or loss if switch to addendum.

Hence there is a net benefit of switching to the addendum, both in terms of major discrepancies (19 resolved, only 3 new introduced) and in terms of all discrepancies (75 resolved, only 26 new introduced). Using conditional logistic regression (with robust standard errors that allow for non-independence of results from the same hospital) both these differences are statistically significant (p=0.006, major discrepancies: p<0.0001, all discrepancies).

Overall, switching to the addendum reduces the number of discrepancies from 123 (13 + 75 + 35) to 74 (13 + 26 + 35), with the number of major discrepancies reduced from 35 (4 + 19 + 12) to 19 (4 + 3 + 12).

2.2.2 Surgical Data (N=635)

i) Provisional, Auditor and Addendum all agree 510. No gain or loss if switch to addendum.

ii) Provisional, Auditor and Addendum all disagree 13 (7 Major (all discrepancies), 6 Minor). No gain or loss if switch to addendum.

iii) Auditor agrees with Addendum, not with Provisional 72 (45 Major, 27 Minor). Gain if switch to addendum.

iv) Auditor agrees with Provisional, not with Addendum 13 (2 Major, 11 Minor). Of 3 Major all came to no harm. Loss if switch to addendum.

v) Provisional agrees with Addendum, not with Auditor 27 (8 Major, 19 Minor). No gain or loss if switch to addendum.

Hence there is a net benefit of switching to the addendum, both in terms of major discrepancies (45 resolved, only 2 new introduced) and in terms of all agreements discrepancies (72 resolved, only 13 new introduced). Using conditional logistic regression (with robust standard errors that allow for non-independence of results from the same hospital) both these differences are statistically significant (p<0.0001, major discrepancies: p<0.0001, all discrepancies).

Overall, switching to the addendum reduces the number of discrepancies from 112 (13 + 72 + 27) to 53 (13 + 13 + 27), with the number of major discrepancies reduced from 60 (7 + 45 + 8) to 17 (7 + 2 + 8).

Section 3: Sensitivity and Specificity for Common Pathologies

3.1 Definition of terms:

i) True Positives (TP): the provisional CT report has the diagnosis in question as the major diagnosis, and auditor (or laparotomy) and provisional concur.

ii) True Negatives (TN): the provisional CT report does not have the diagnosis in question as the major diagnosis, and auditor (or laparotomy) and provisional concur.

iii) False Positives (FP): the provisional CT report has the diagnosis in question as the major diagnosis, the auditor (or laparotomy) and provisional do not concur and the auditor (or laparotomy) does not have the diagnosis in question as the major diagnosis.

iv) False Negatives (FN): the provisional CT report does not have the diagnosis in question as the major diagnosis, the auditor (or laparotomy) and provisional do not concur and the auditor (or laparotomy) does have the diagnosis in question as the major diagnosis.

v) Non-concurrence, with indication of diagnosis (NCID): the provisional CT report has the diagnosis in question as the major diagnosis, the auditor (or laparotomy) and provisional do not concur but the auditor (or laparotomy) also has the diagnosis in question as the major diagnosis.

vi) Non-concurrence, with no indication of diagnosis (NCNID): the provisional CT report does not have the diagnosis in question as the major diagnosis, the auditor (or laparotomy) and provisional do not concur and the auditor (or laparotomy) also does not have the diagnosis in question as the major diagnosis.

The NCID and NCNID categories are omitted from calculation of sensitivities and specificities, because of the uncertainty over the correct diagnosis.

Confidence Intervals (CI) are Bootstrap 95% CI (non-parametric, bias corrected and accelerated, computed from 100,000 bootstrap samples clustered by hospital).

Appendix D

Sensitivity/specificity calculations were undertaken in relation to the ten most common pathologies in the surgical and non-surgical groups using the final auditor diagnosis as the reference standard (pathology identified from provisional report if concordant with auditor, if not concordant then derived from the auditor or laparotomy diagnosis). Definitions for true positive, true negative, false positive and false negative are included in Appendix B. Two additional terms are used (see result tables and appendices B and C). Non-concurrence with indication of diagnosis (NCID) – the provisional CT report contains the diagnosis in question when compared to auditor/laparotomy findings, but the provisional report diagnosis is part of an indeterminate report and thereby recorded as non-concurrence. The second term is non-concurrence with no indication of diagnosis (NCNID) – in these cases neither the provisional nor auditor/laparotomy diagnoses contain the diagnosis in question, but there is also non-agreement between provisional and auditor/laparotomy findings. So, for example in NCNID, looking at cases negative for appendicitis, the provisional report and auditor/laparotomy would contain a diagnosis other than appendicitis but differing also from one another, so not true negatives for appendicitis for the purposes of the audit. NCID and NCNID cases were excluded from calculations. Bootstrap 95% confidence intervals (non-parametric, bias corrected and accelerated) for sensitivities and specificities were computed from 100,000 bootstrap samples clustered by hospital.

Non-surgical results are found in table 1, surgical results in table 2. In addition, the ten most common provisional report CT diagnosis sensitivity/specificity calculations were then repeated, but using the laparotomy diagnosis as the reference standard (see table 3). CT was most sensitive in the diagnosis of appendicitis using both the auditor and laparotomy as reference standard (96.4%, 95.6% respectively). There was a considerable drop off however noted in relation to the diagnosis of ischaemic bowel when using the auditor as reference standard (89.5%) as opposed to laparotomy (72.5%).

It is beyond the scope of this report to cover all pathologies in these areas but of note is the reduction in sensitivity of CT in the diagnosis of ischaemic bowel in the surgical group when using the auditor as reference standard (89.5%) when compared to laparotomy (72.5%); specificity was the same in both groups (99.5%). The specificity compares well with published data[1], with sensitivity reduced. The reasons for this are unclear but may reflect difficulties encountered when diagnosing early stages of intestinal ischaemia on CT and later correlated with laparotomy findings.

1. Jang K, Min K, Kim M et al. Diagnostic performance of CT in the detection of intestinal ischaemia associated with small bowel ischaemia associated with small bowel obstruction using maximal attenuation of region interest. AmJ Roentgenol; 2010; 184 (4); 857-863

Table 1
Non-surgical group, ten most common provisional report CT diagnoses compared with auditor as reference standard.

Non-Surgical Diagnosis	TP	FN	Sensitivity (TP/(TP+FN)) (95% CI)	TN	FP	Specificity (TN/(TN+FP)) (95% CI)	NCID	NCNID
Acute pancreatitis	107	5	95.5% (90.3%, 98.3%)	2173	7	99.7% (99.4%, 99.9%)	3	273
Colitis (infective, ulcerative, pseudomenbranous)	99	10	90.8% (83.5%, 95.5%)	2181	11	99.5% (99.1%, 99.7%)	4	263
Acute cholecystitis	100	6	94.3% (87.5%, 98.1%)	2180	8	99.6% (99.2%, 99.9%)	4	270
Small bowel obstruction (adhesion, tumour)	91	8	91.9% (84.9%, 96.4%)	2189	15	99.3% (98.9%, 99.6%)	2	263
Focal abscess (abdomen/pelvis)	84	3	96.6% (91.5%, 98.9%)	2196	3	99.9% (99.6%, 100.0%)	4	278
Acute diverticulitis	55	4	93.2% (84.6%, 98.2%)	2225	9	99.6% (99.3%, 99.8%)	3	272
Free intraperitoneal air (perforation of oesophagus, stomach, duodenum, small bowel, colon, appendix)	40	7	85.1% (71.4%, 93.6%)	2240	3	99.9% (99.5%, 100.0%)	3	275
Small bowel ileus	47	2	95.9% (85.7%, 100.0%)	2233	4	99.8% (99.6%, 100.0%)	0	282
Appendicitis (uncomplicated)	44	1	97.8% (86.7%, 100.0%)	2236	5	99.8% (99.4%, 99.9%)	2	280
Ischaemic bowel (small bowel/colon/stomach)	37	6	86.0% (73.5%, 95.1%)	2243	4	99.8% (99.6%, 100.0%)	1	277

Table 2
Surgical group, ten most common provisional report CT diagnoses compared with auditor as reference standard.

Surgical Diagnosis	TP	FN	Sensitivity (TP/(TP+FN)) (95% CI)	TN	FP	Specificity (TN/(TN+FP)) (95% CI)	NCID	NCNID
Small bowel obstruction (adhesion, tumour)	414	18	95.8% (93.3%, 97.6%)	1666	28	98.3% (97.5%, 98.9%)	24	213
Free intraperitoneal air (perforation of oesophagus, stomach, duodenum, small bowel, colon, appendix)	239	18	93.0% (88.5%, 95.9%)	1841	9	99.5% (99.1%, 99.8%)	10	246
Appendicitis (uncomplicated)	243	9	96.4% (94.0%, 98.2%)	1837	23	98.8% (97.3%, 99.3%)	5	246
Tumour (colorectal, small bowel, appendix)	91	16	85.0% (76.9%, 91.2%)	1989	5	99.7% (99.4%, 99.9%)	6	256
Appendix mass, mucocele, abscess	83	20	80.6% (65.8%, 88.4%)	1997	1	99.9% (99.7%, 100.0%)	1	261
Diverticular perforation	91	9	91.0% (80.2%, 96.1%)	1989	5	99.7% (99.4%, 99.9%)	3	266
Ischaemic bowel (small bowel /colon/stomach)	77	9	89.5% (82.6%, 94.6%)	2003	10	99.5% (99.1%, 99.8%)	0	264
Large bowel obstruction	91	5	94.8% (89.0%, 98.0%)	1989	8	99.6% (99.3%, 99.8%)	8	262
Anastomotic leak	40	5	88.9% (78.6%, 95.6%)	2040	1	100.0% (99.7%, 100.0%)	2	275
Focal abscess (abdomen/pelvis)	40	6	87.0% (75.0%, 95.5%)	2040	7	99.7% (99.3%, 99.9%)	3	267

Table 3
Surgical group, ten most common provisional report CT diagnoses compared to laparotomy as reference standard.

Surgical Diagnosis	TP	FN	Sensitivity (TP/(TP+FN)) (95% CI)	TN	FP	Specificity (TN/(TN+FP)) (95% CI)	NCID	NCNID
Small bowel obstruction (adhesion, tumour)	409	21	95.1% (91.9%, 97.3%)	1577	39	97.6% (96.7%, 98.3%)	10	254
Free intraperitoneal air (perforation of oesophagus, stomach, duodenum, small bowel, colon, appendix)	233	33	87.6% (83.2%, 91.3%)	1753	9	99.5% (99.1%, 99.8%)	9	273
Appendicitis (uncomplicated)	237	11	95.6% (92.3%, 97.7%)	1749	25	98.6% (96.5%, 99.3%)	5	283
Tumour (colorectal, small bowel, appendix)	89	21	80.9% (71.3%, 87.8%)	1897	6	99.7% (99.3%, 99.9%)	2	295
Appendix mass, mucocele, abscess	82	24	77.4% (60.0%, 87.2%)	1904	1	99.9% (99.7%, 100.0%)	1	298
Diverticular perforation	87	12	87.9% (79.4%, 93.9%)	1899	9	99.5% (99.2%, 99.8%)	2	301
Ischaemic bowel (small bowel /colon/stomach)	74	28	72.5% (63.5%, 80.2%)	1912	10	99.5% (99.0%, 99.7%)	1	285
Large bowel obstruction	90	6	93.8% (86.9%, 97.8%)	1896	13	99.3% (98.5%, 99.7%)	2	303
Anastomotic leak	38	7	84.4% (68.8%, 93.5%)	1948	4	99.8% (99.5%, 99.9%)	1	312
Focal abscess (abdomen/pelvis)	40	6	87.0% (73.9%, 95.5%)	1946	10	99.5% (99.1%, 99.7%)	0	308

Note.- 53 subjects omitted due to “no response” laparotomy information.