

Introduction

- Crohn's disease (CD) patients are exposed to substantial radiation from repeat CTs given multiple ED visits and early age of diagnosis, with concern that multiple scans infrequently identify clinically significant findings
- Previous studies reported on predictors of urgent findings – obstruction, perforation, abscess, or non-CD urgent findings (OPAN) on CT
- We sought to identify patient characteristics correlating with increased number of scans and OPAN findings

Methods

- 660 CD patients from 4 gastroenterology practices presenting to one healthcare system with 3 hospitals from 4/15/15 to 12/31/18 were identified and cross-referenced with a radiology database search generating 1778 CT scans performed at these ED encounters
- Presence of OPAN was noted
- We manually chart reviewed a stratified random sample of 200 of these encounters, utilized cluster analysis to empirically group patients based on demographics and clinical profiles, and used generalized linear modeling to compare number of scans and meaningful clinical data between groups (Table 1)
 - Clusters were based on Euclidian distance and grouped using Ward's method

	GROUP 1	GROUP 2	GROUP 3	GROUP 4
PRESENTING SYMPTOM				
Acute (<48 hours) abdominal pain (%)	47%	65%	95%	74%
Diffuse abdominal pain (%)	76%	51%	60%	63%
VITALS/LABS				
Temperature	98	98	98	99
Heart Rate	91 (88-95)	88 (83-94)	106 (99-112)	97 (92-102)
White Blood Cell (WBC) count	10 (9-11)	10 (9-12)	16 (14-19)	10 (9-11)
ESR	69 (56-89)	14 (10-19)	55 (40-79)	68 (53-91)
CRP	76 (61-97)	3 (2-4)	49 (36-71)	73 (57-98)
OUTPATIENT MEDICATIONS				
Biologic Use (%)	60% (48-70%)	41% (27-57%)	63% (46-77%)	21% (12-34%)
Steroid Use (%)	31% (21-42%)	32% (19-47%)	49% (33-65%)	17% (9-30%)
Opioid Use (%)	51% (40-63%)	39% (25-55%)	60% (43-75%)	10% (4-21%)
SOCIAL FACTORS				
Medicare/Medicaid (%)	22% (14-33%)	2% (0-16%)	9% (3-24%)	8% (3-19%)
Non-English Speaking (%)	21% (13-32%)	7% (2-20%)	6% (1-20%)	6% (2-17%)
History of Depression/Anxiety (%)	72% (61-81%)	61% (45-75%)	60% (43-75%)	46% (33-60%)
Missed Outpatient Appointments (%)	25% (16-36%)	10% (4-23%)	9% (3-24%)	33% (21-47%)

Table 1. Grouping of patient encounters

Results

- Patients presenting with acute and/or diffuse abdominal pain were more likely to undergo CT
- Those with barriers to healthcare (including non-private insurance, missed outpatient appointments, infusion non-adherence, or limited English proficiency) had higher levels of ESR/CRP and increased rate of OPAN findings
- Those with fewer barriers often had no/mild ESR/CRP elevations and lowest rate of OPAN findings
- The group with the least biologic agent use and more missed appointments had highest ESR/CRP and number of OPAN findings
- A majority of patients with multiple ED visits and scans had anxiety/depression
- The difference in rate of OPAN findings between each group was not statistically significant (Figure 1)

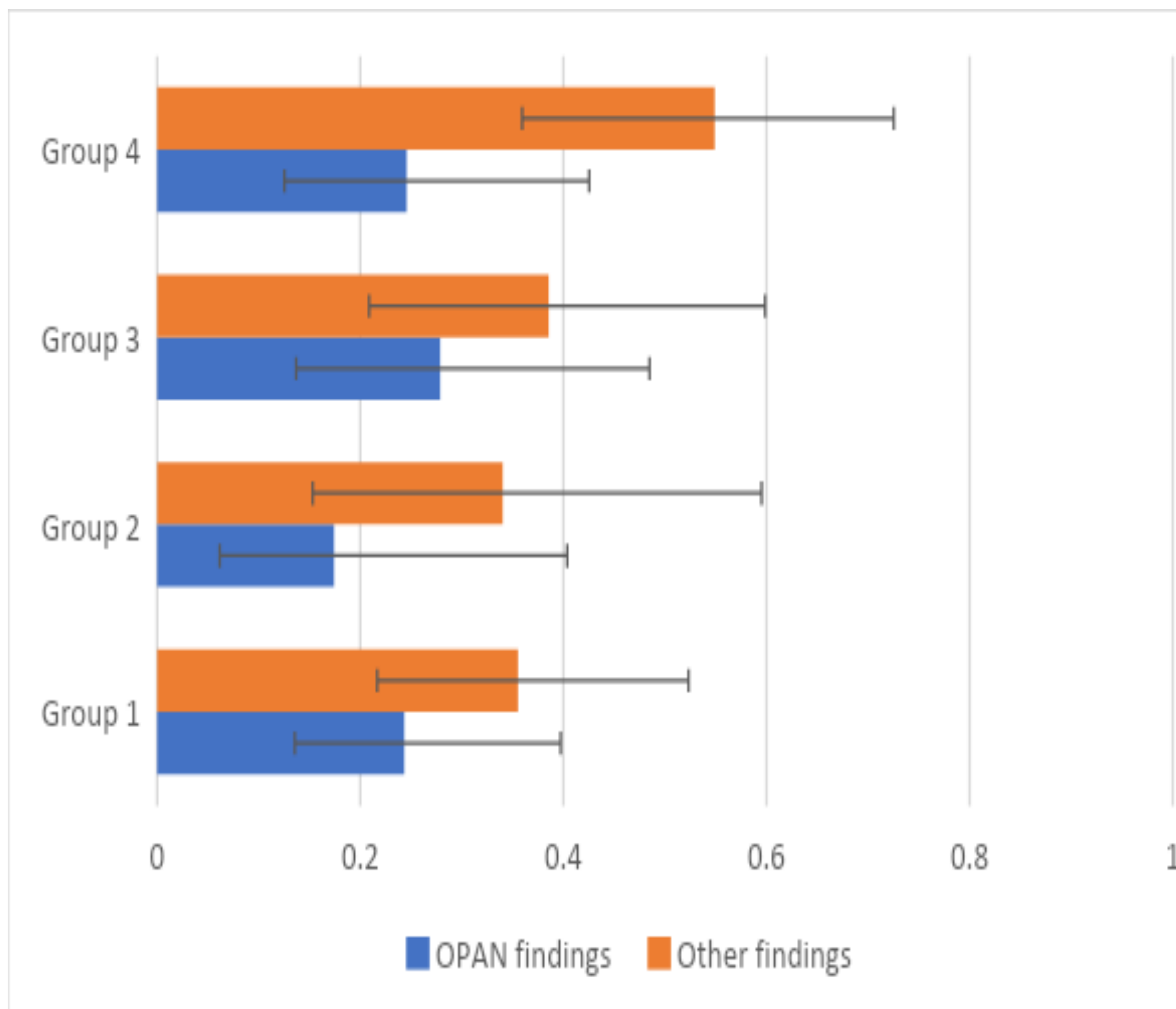


Figure 1. Probability of clinical findings by group. "Other findings" include non-urgent findings on CT such as thickening, structuring, or fistulas

Discussion

- Prior studies have shown that positive predictors of OPAN include high WBC, tachycardia, elevated inflammatory markers, and use of opioids and steroids which may mask pain
- Negative predictors include biologic use and recent negative CT
- Our study raises concerns about the barriers to healthcare with missed outpatient appointments, repeat scans, and inconsistent identification of presence of OPAN
- Without adequate access to outpatient follow-up, patients who develop abdominal pain or CD-related symptoms are more likely to present to the ED and be subsequently scanned
- This data highlights the importance of improving social determinants of healthcare resources for CD to ultimately reduce excess radiation exposure