

Epidemiology of Surgically Correctable Gastrointestinal Disease among Neonates in Cape Town, South Africa



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Introduction

- There is a gap in evidence needed to inform resource allocation decisions in pediatric surgery and to a greater degree in neonatal surgery.¹
- Gastrointestinal (GI) disease is a serious source of death and life-long disability in neonates.^{2,3}
- Primary prevention differs between acquired and congenital GI disease however is difficult given their complex etiologies.⁴
- Surgery, therefore, is necessary for secondary prevention—particularly in conditions often first presenting as acute conditions.^{4,5}
- This research will assess the surgical burden of neonatal correctable GI conditions in South Africa in order to contribute to accuracy in assessment of surgical burden in low-middle income countries (LMICs).

Research Question

What is the surgical burden of surgically correctable GI conditions among neonates in one LMIC (South Africa)?

Materials and Methods

- One-year retrospective review at Red Cross War Memorial Children's Hospital & Tygerberg Children's Hospital in Cape Town, South Africa from July 2010 to June 2011.
- All general pediatric surgery case records were de-identified, given a systems-based category, and given an etiological category (congenital, acquired, indeterminate, and "diagnostic only").
- All subsequent procedures related to original neonatal diagnoses were included.
- Descriptively analyzed diagnoses, case numbers, and individual procedures

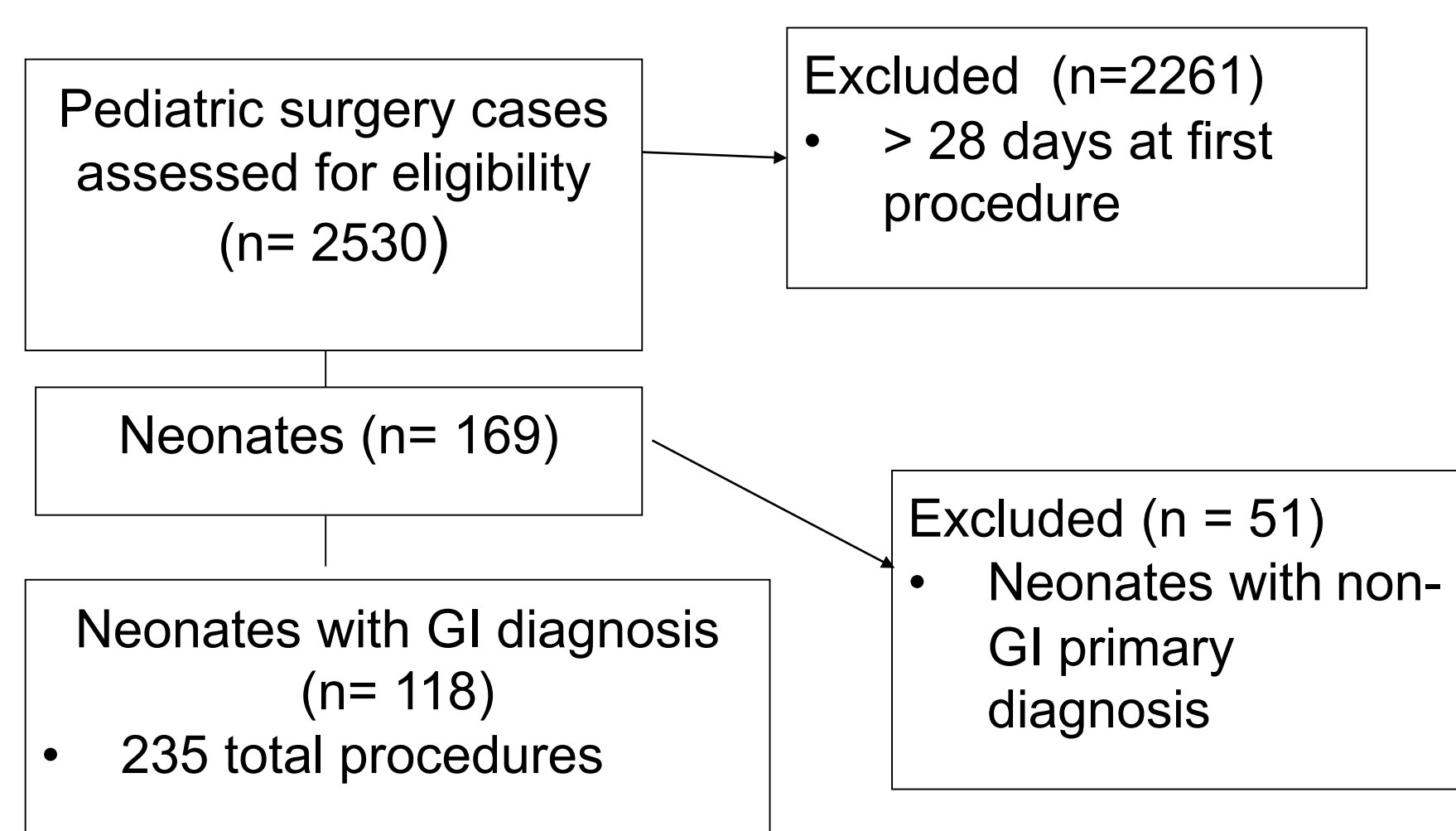


Figure 1: Process of patient inclusion for review.

Results

- We analyzed a total of 118 neonates with GI diagnoses that underwent a total of 236 surgical procedures.
- Enterectomy/enterostomy and vascular access cover 15 and 7 distinct diagnoses, respectively.
- Intestinal atresia (3.14), gastroschisis (3.09), and NEC (2.78) had significantly higher mean number of procedures per patient than other procedures but were insignificant with each other (calculated by one-way ANOVA for $n > 5$: $F(7,82) = 3.491$, $p = 0.0025$ and post hoc least significant difference test ($\alpha = 0.05$))

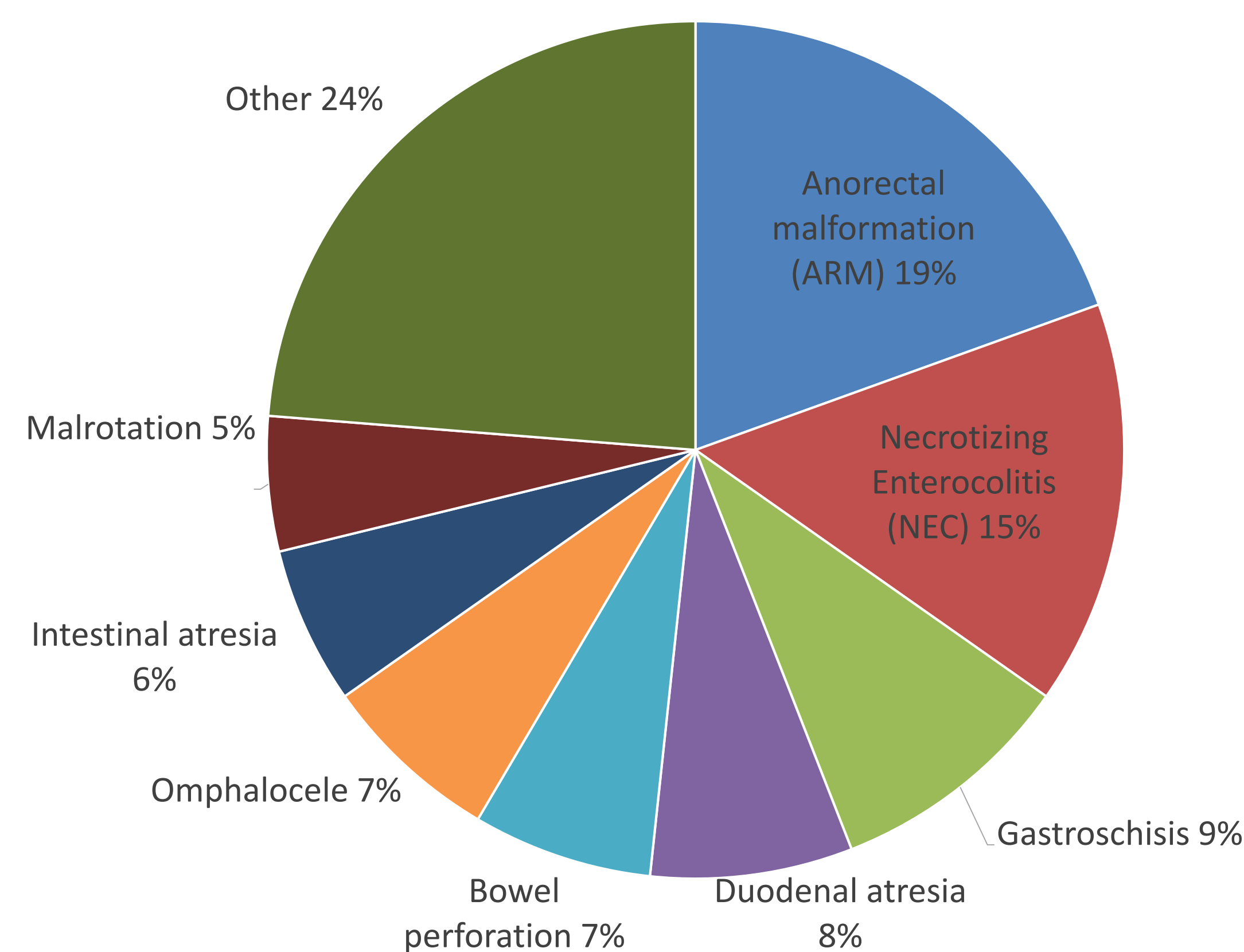


Figure 2: Primary Diagnoses (percent of patients).

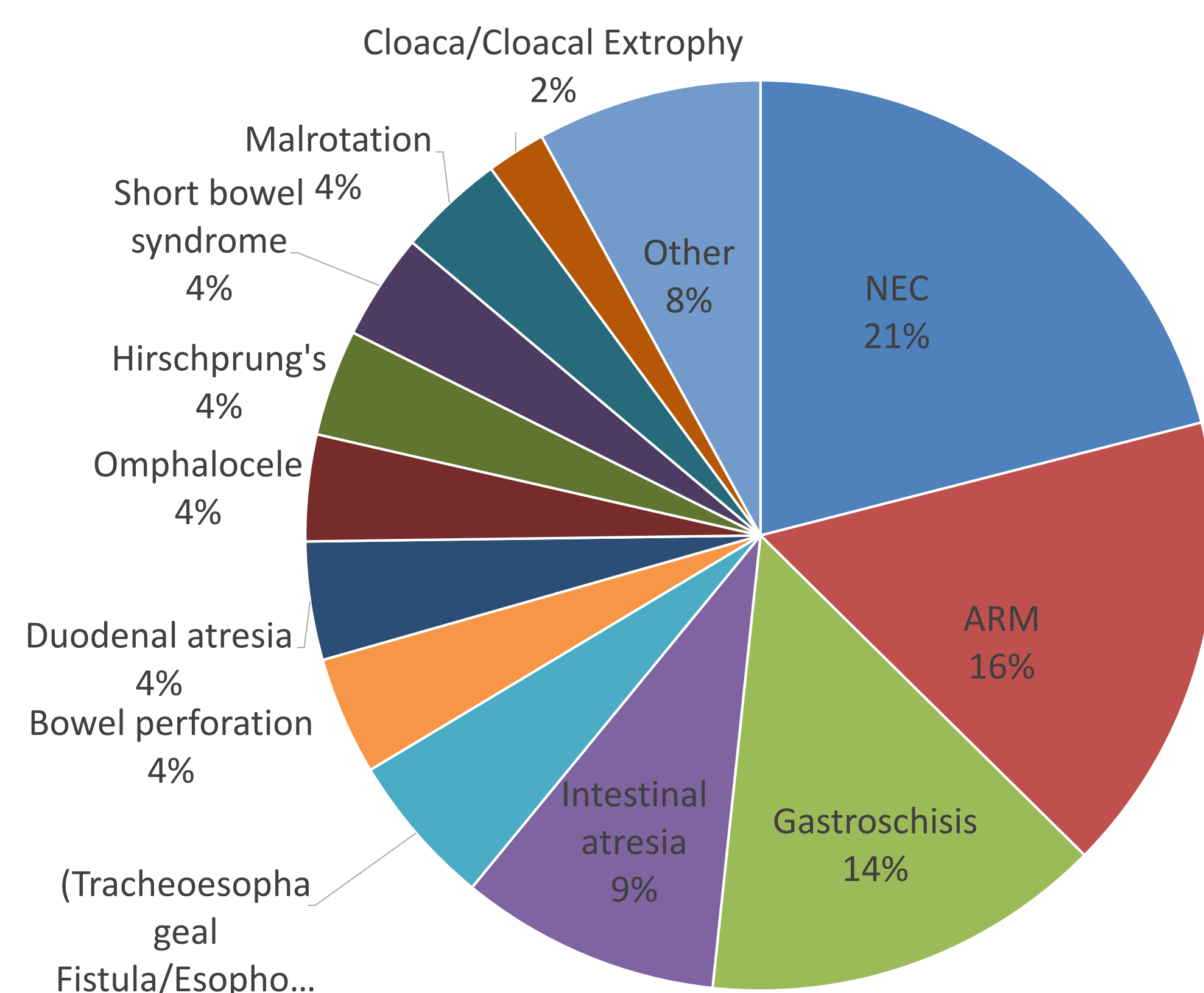


Figure 3: Primary diagnoses (percent of procedures).

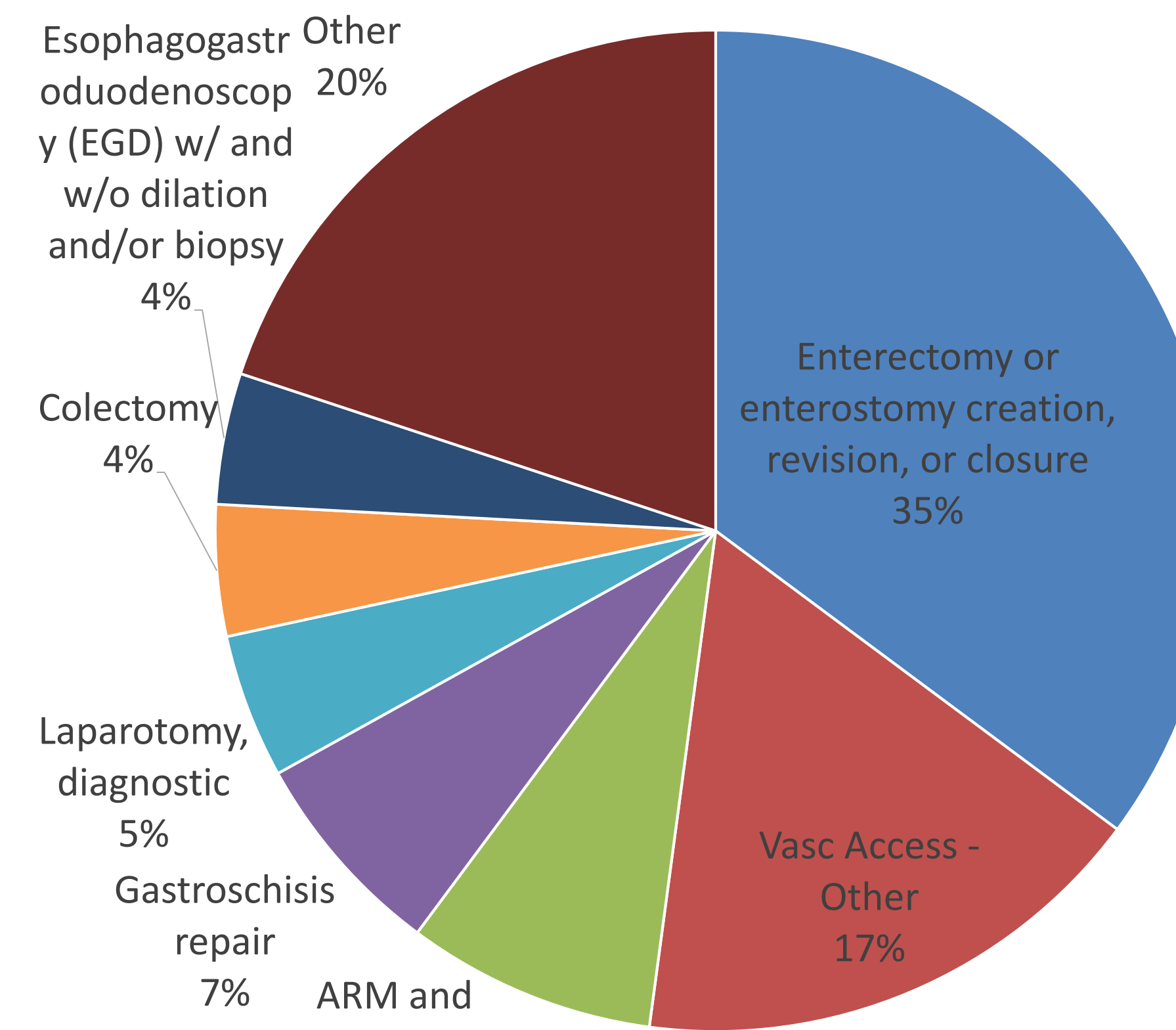


Figure 4: Surgical Procedures performed.

Type of Disease (% All Patients)	Dx Frequency (%)	Case Burden (%)
Congenital (69.5%)		
Primary Dx		
ARM	23 (28%)	39 (24.7%)
Gastrochisis	11 (13.4%)	34 (21.5%)
Duodenal atresia	9 (11%)	10 (6.3%)
Omphalocele	8 (9.8%)	9 (5.7%)
Intestinal atresia	7 (8.5%)	22 (13.9%)
Malrotation	6 (7.3%)	9 (5.7%)
TEF/EA	4 (4.9%)	13 (8.2%)
Hirschprung's Cloaca/Cloacal Extrophy	4 (4.9%)	5 (3.2%)
Pyloric stenosis	2 (2.4%)	2 (1.3%)
Bowel perforation	1 (1.2%)	2 (1.3%)
VACTREL	1 (1.2%)	2 (1.3%)
Hiatal hernia	1 (1.2%)	1 (0.6%)
Pneumoperitoneum	1 (1.2%)	1 (0.6%)
Total	82	158
Acquired (26.3%)		
NEC	18 (58.1%)	50 (68.5%)
Bowel perforation	7 (22.6%)	8 (11%)
Appendicitis	2 (6.5%)	2 (2.7%)
Short bowel syndrome	1 (3.2%)	9 (12.3%)
Rectal perforation	1 (3.2%)	2 (2.7%)
Prolapse ileostomy	1 (3.2%)	1 (1.4%)
Stomal break down	1 (3.2%)	1 (1.4%)
Total	31	73

Table 1: Diagnostic frequency and case burden stratified by congenital and acquired etiologies. 5 "patients from Indeterminate" and "diagnostic only" categories were not included for brevity.

Conclusion

- These findings provide rationale to the prioritization of macro, micro, and meso-level interventions related to the diagnoses and procedures most in need. This includes obvious primary preventative needs as well as secondary and tertiary.
- Enterectomy/enterostomy training is a potential area of focus to improve on neonatal outcomes
- 18% of the total procedures were minor, raising question to possibility of delegation to practitioners with less advanced surgical training.

Summary

- The three most frequent diagnoses were ARMs, NEC, and gastrochisis-- totaling 43% of all diagnoses and 51% of all cases
- The majority of diagnoses and surgical cases were secondary to congenital diagnoses (69.5%)
- Most common procedures were related to some stage of enterectomy or enterostomy

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