

# Audit on Intussusception Reduction Service in PWH Radiology Department

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# Background-Intussusception in Children

- Telescoping of bowel into itself
  - In children, usually ileocolic (ileum into colon)
- Successful radiological reduction
  - Prevent need of surgery in children
  - **First-line** treatment
  - Performed in QMH, QEH(&UCH) and PWH in HA setting
    - paediatric surgery support available
  - With earlier the reduction
    - higher chance of success and less complication rate<sup>1</sup>

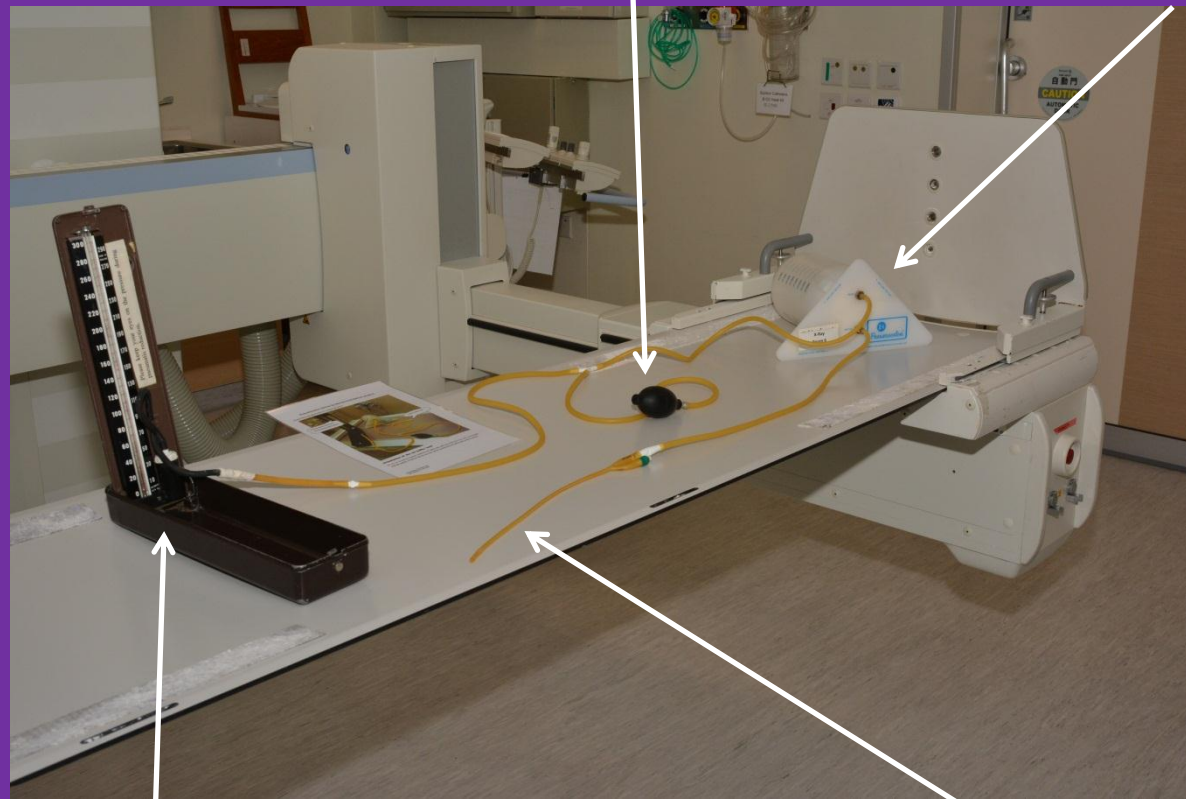


Extract from University of Minnesota, Amplatz Children's Hospital (website)

# Setup for Pneumatic Reduction under Fluoroscopy Guidance in PWH

Hand pump

Pneumocolon set



Sphygmomanometer

Rectal tube (Foley's catheter)

# Workflow of Suspected Intussusception in PWH

- Diagnostic ultrasound performed by radiologists in X-Ray Dept to confirm intussusception
- Once intussusception confirmed, radiologist liaise with paediatric surgeon to arrange pneumatic reduction
- Patient will be directly transferred to fluoroscopy room to prepare pneumatic reduction rather than sent back to ward first and come down again
  - to avoid delay



# The Standard and Our Target

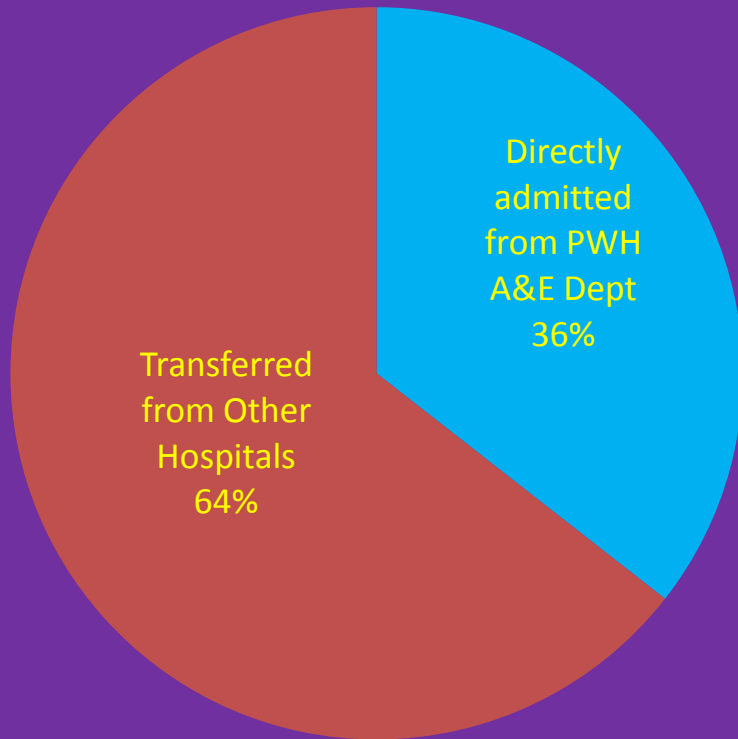
- The Standard
  - successful rate >70% should be achievable by non-operative reduction
    - According to a retrospective survey in UK in 1999 <sup>2</sup>
- Our Target
  - We aim at successful rate > 70%

# Method

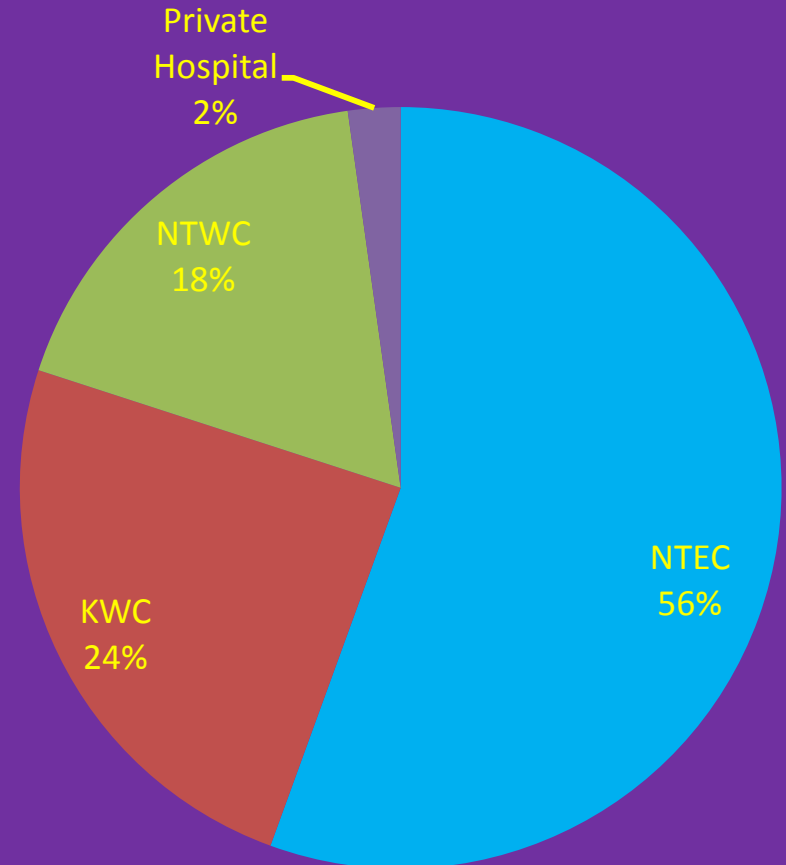
- All intussusception reduction cases
  - From Jan 2012 to December 2013 (2 years)
  - Identified by the Radiology Information System (RIS)
  - Radiology report and clinical Information reviewed by ePR

# Referral Pattern

Referral Pattern-Direct admission from PWH vs transferred from other hospitals

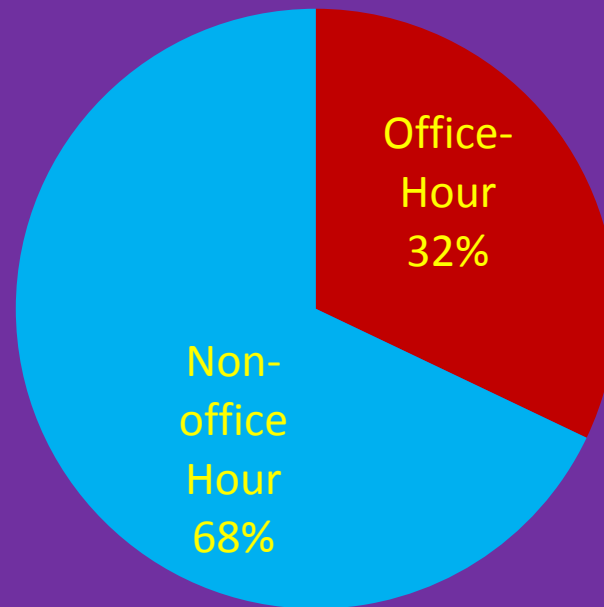


Referral Pattern-By HA Clusters



# Time of Performing Pneumatic Reduction-Office vs Non-Office Hr

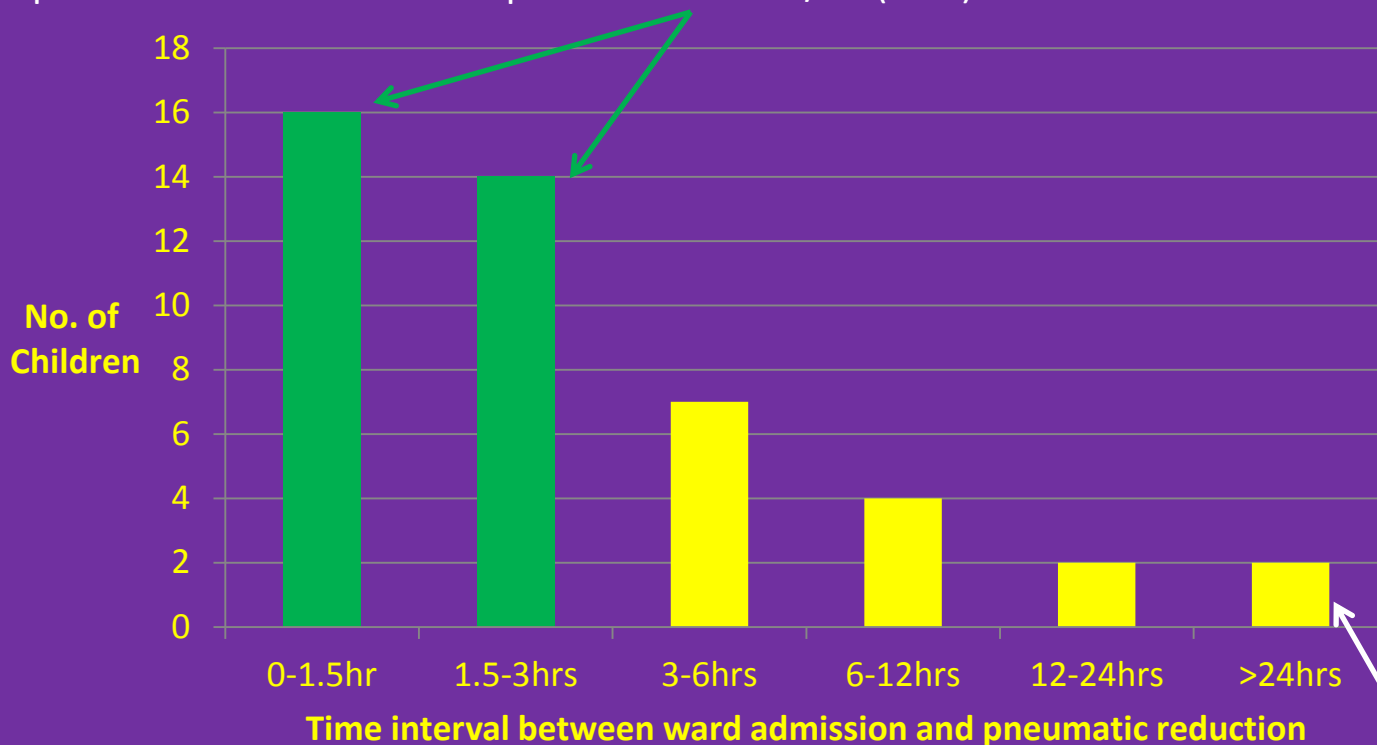
Time of Performing  
Pneumatic Reduction-  
Office vs Non-Office Hour





# Time Interval Between Admission to Ward and Pneumatic Reduction

- Median time between ward admission & first reduction trial = 2 hours
- First pneumatic reduction attempted < 3 hrs in 30/45 (67%) children



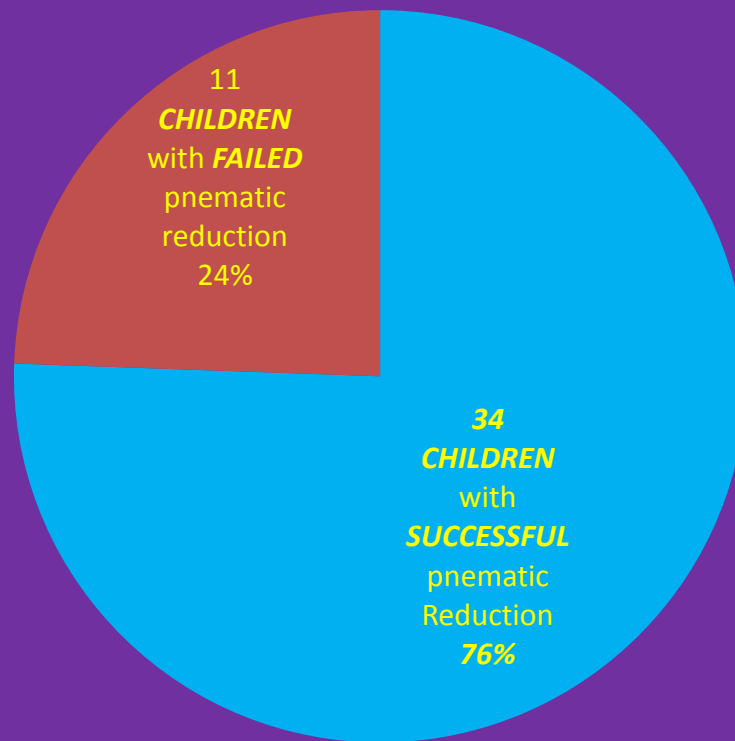
1 child initially admitted to paediatric ward for fever & abdominal pain before transferring to paediatric surgery ward, >24 hrs between admission and reduction

# Results – Patients and Procedures

- 45 children identified
  - Mean age = 1.97 year old (range 2.5 months to 7yo)
- Total 53 reductions in these 45 children
  - 6 children (13%) suffered from recurrent intussusception
    - 1 recurrence in 4 children
    - 2 recurrences in 2 children
    - i.e. Total 8 procedures (1x4 + 2x2) for recurrent intussusception
- All confirmed by ultrasound before pneumatic reduction

# Outcome of Pneumatic Reduction

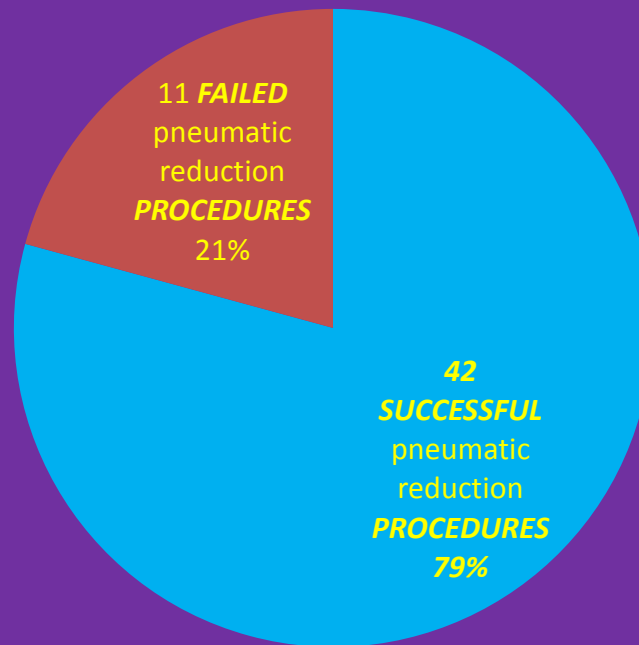
Percentage of Children with  
successful pneumatic reduction



Pneumatic reduction successful in  
**76%** of the *children*

# Outcome of Pneumatic Reduction

Successful rate of pneumatic reduction procedures



**79%** of the pneumatic reduction **procedures** were successful

## Results – Complication rate and need of surgery after successful pneumatic reduction

- No complication (e.g. bowel perforation) observed
  - 1 child underwent diagnostic laparotomy to investigate intestinal obstruction
    - No perforation found, no bowel resection/repair needed
- Surgery avoided in 33/45 (73%) children

# Results – Unsuccessful Pneumatic Reduction

- Pneumatic reduction failed in 11/45 (24%) children and 11/53 (21%) procedures
  - All underwent surgery
  - 4 children without lead points (36%)
    - pneumatic reduction performed < 2 hrs for them
  - Lead points in remaining 7/11 children (64%)
  - None of the unsuccessful procedures from recurrent intussusception occurred during our admission
    - Excluding 1 referral of unsuccessful reduction transferred from private hospital to us

# Summary – Successful Rate

- Successful rate of intussusception pneumatic reduction in PWH comparable with / even better than international standard
  - May be due to pneumatic reduction procedures promptly carried out after admission
- No complication observed

# Summary – Failed Pneumatic Reduction

- Lead points found in majority of failed pneumatic reduction (64%)
- Remaining failed pneumatic reductions without lead points (36%)
  - Pneumatic reduction carried out promptly (<2 hrs) for them after ward admission on retrospective review
- Recurrent intussusception occurred after admission all successfully reduced by pneumatic reduction
  - Worthwhile to re-attempt pneumatic reduction in recurrent intussusception



# Reference

1. Shapkina AN, Shapkin W, Nelubov IV, Pryanishena LT. Intussusception in children: 11-year experience in Vladivostok. *Pediatr Surg Int* 2006;22(11):901-904
2. Rosenfeld K, McHugh K. Survey of intussusception reduction in England, Scotland and Wales: how and why we could do better. *Clinical Radiology* 1999; 54: 452-458

Thank you