

# The Utility of Echocardiography and Pulmonary Function Testing in the Preoperative Management of Patients with Pectus Excavatum

Kathryn LaRusso, MD; Olivia Ganescu, BS; Etienne St-Louis, MD; Christine Saint-Martin, MD; Tiscar Cavalle-Garrido, MD; David Zielinski, MD; Noémie Dahan-Oliel, MD; Jean Martin Laberge MD; Sherif Emil, MD.

The Montreal Children's Hospital, McGill University Health Centre & Shriners Hospitals for Children Canada, Montreal, Quebec.

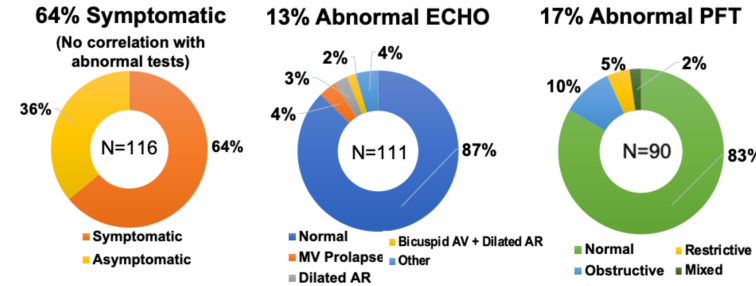
## BACKGROUND

- Repair of pectus excavatum (PE) is typically based on the severity of deformity, cardiopulmonary abnormalities, & psychological impact.
- Preop evaluation usually consists of echocardiography (ECHO) & pulmonary function testing (PFT).
- ECHO & PFT results may not impact decision for surgery



Figure 1.  
Pectus excavatum

## RESULTS



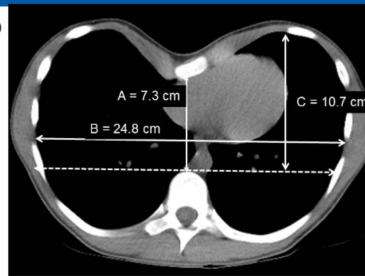
- 12/14 Abnormal ECHO required cardiology follow-up
- None influenced surgical decision-making

## CONCLUSIONS

- Prevalence of abnormal ECHO and PFT in patients undergoing Nuss procedure is low & does not correlate with symptoms.
- Increasing pectus severity is associated with higher likelihood of abnormal results.
- Routine ECHO is indicated to screen for cardiac anomalies requiring follow-up.
- Routine PFT is not indicated.

## METHODS

- **Retrospective:** PE patients who underwent the Nuss Procedure (2004-2018)
- **Data:** Symptoms, Pre-operative studies, CT Scan: Haller & Correction Index
- **Statistics:** Multivariate logistic regression



Haller Index:  $B/A = 3.4$   
Correction Index:  $(C-A)/C \times 100 = 31.7\%$

Figure 2. HI & CI Assessment

Table 1. Multivariate Analysis of Pectus Severity & Cardiopulmonary Results

	Abnormal PFT	Abnormal ECHO
	Odds Ratio (95% CI)	Odds Ratio (95% CI)
<b>Haller Index</b>	1.81 (0.94-3.59)	2.50 (1.33-5.18)
<b>Correction Index</b>	2.20 (1.11-4.76)	2.00 (1.05-4.03)

- Higher probability of abnormal PFT results if CI  $\geq 42$  or HI  $\geq 4.5$

## CONTACT INFORMATION

Olivia Ganescu, B.S.

McGill Medical Student '21  
Harvey E. Beardmore Division of Pediatric Surgery  
The Montreal Children's Hospital  
McGill University Health Care Centre  
The Shriners Hospitals for Children  
Canada



✉ sherif.emil@mcgill.ca (Senior Author)  
🐦 @DrSherifEmil

✉ olivia.ganescu@mail.mcgill.ca  
🐦 @OGanescu



2020 Annual Meeting eapsa.org #APSA2020



# BACKGROUND

- Repair of pectus excavatum (PE) is typically based on the severity of deformity, cardiopulmonary abnormalities, & psychological impact.
- Preop evaluation usually consists of echocardiography (ECHO) & pulmonary function testing (PFT).
- ECHO & PFT results may not impact decision for surgery

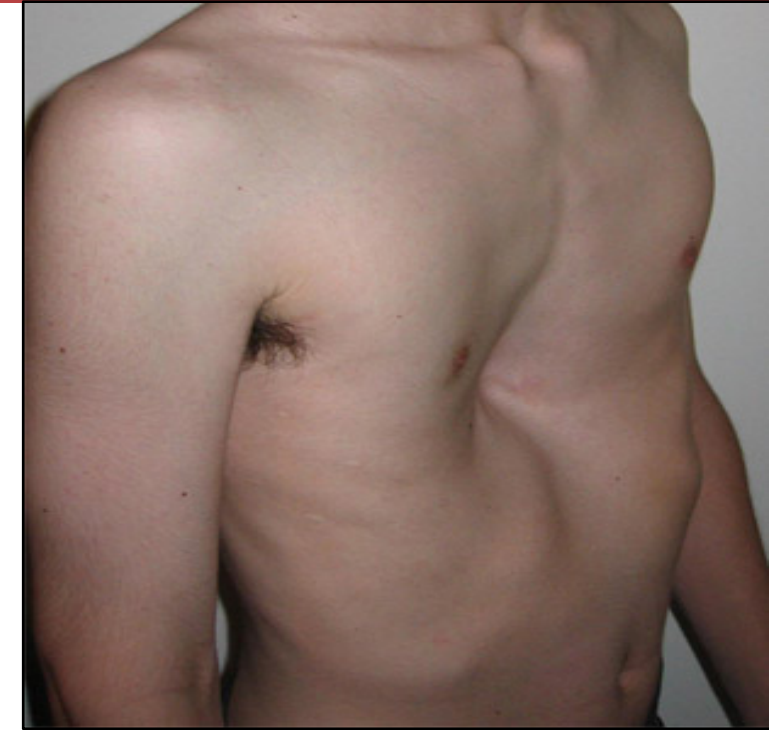
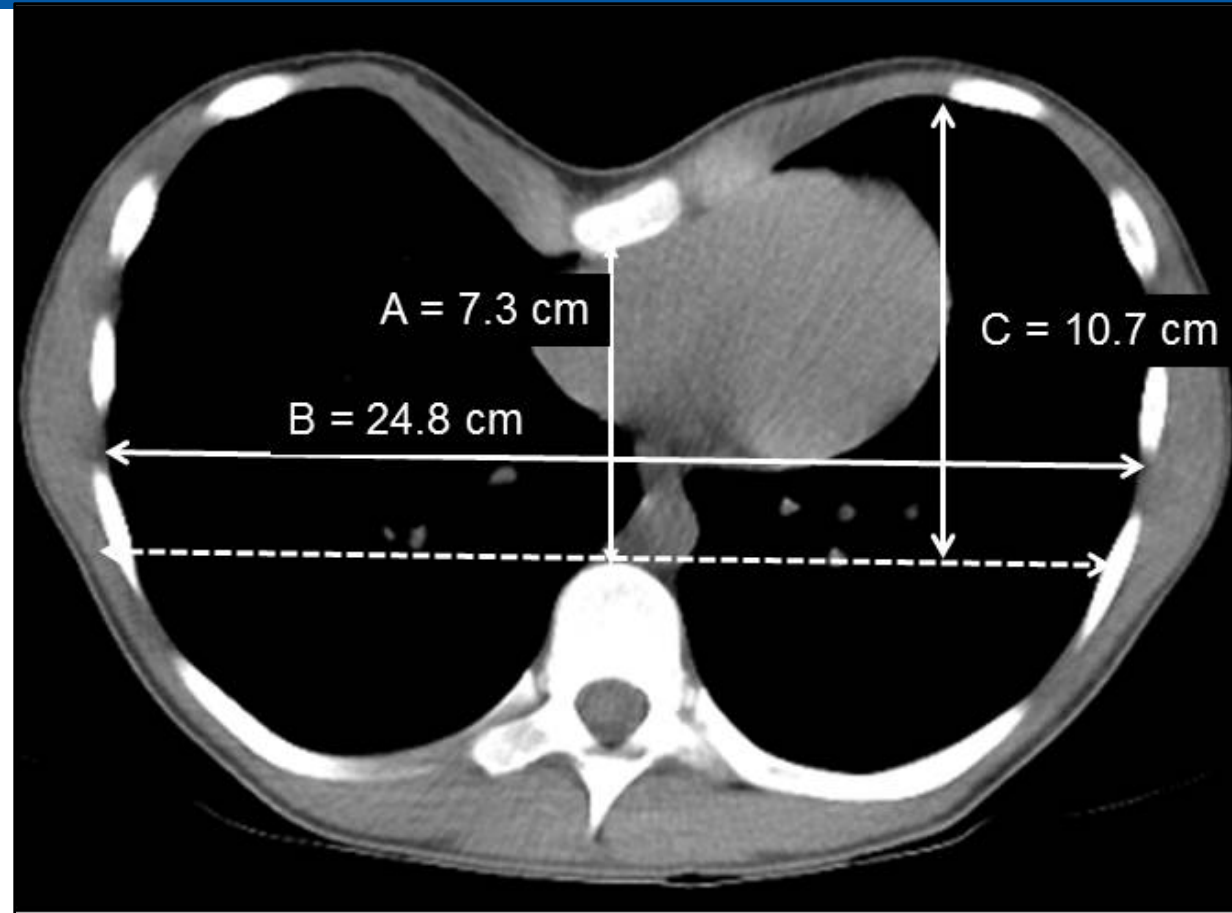


Figure 1.  
Pectus excavatum

# METHODS

- **Retrospective:** PE patients who underwent the Nuss Procedure (2004-2018)
- **Data:** Symptoms, Pre-operative studies, CT Scan: Haller & Correction Index
- **Statistics:** Multivariate logistic regression



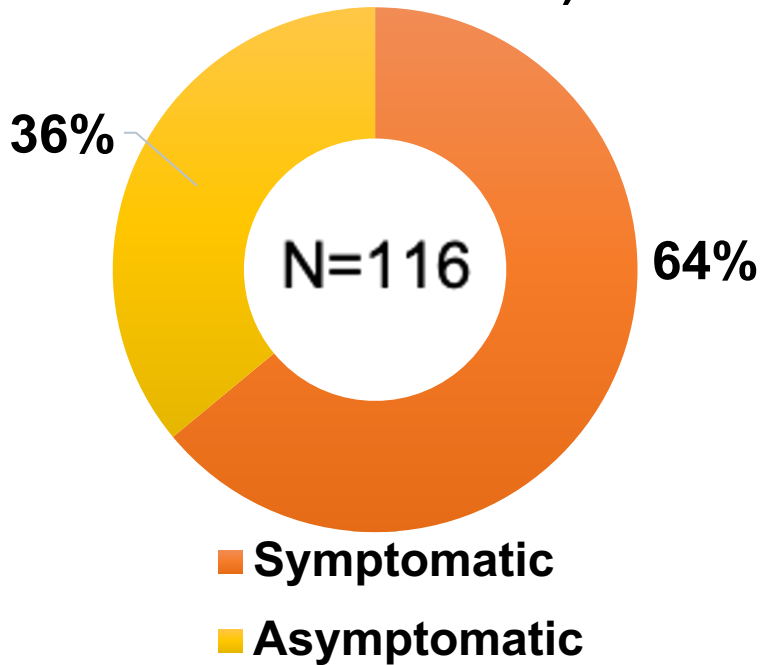
Haller Index:  $B/A = 3.4$       Correction Index:  $(C-A)/C \times 100 = 31.7\%$

Figure 2. HI & CI Assessment

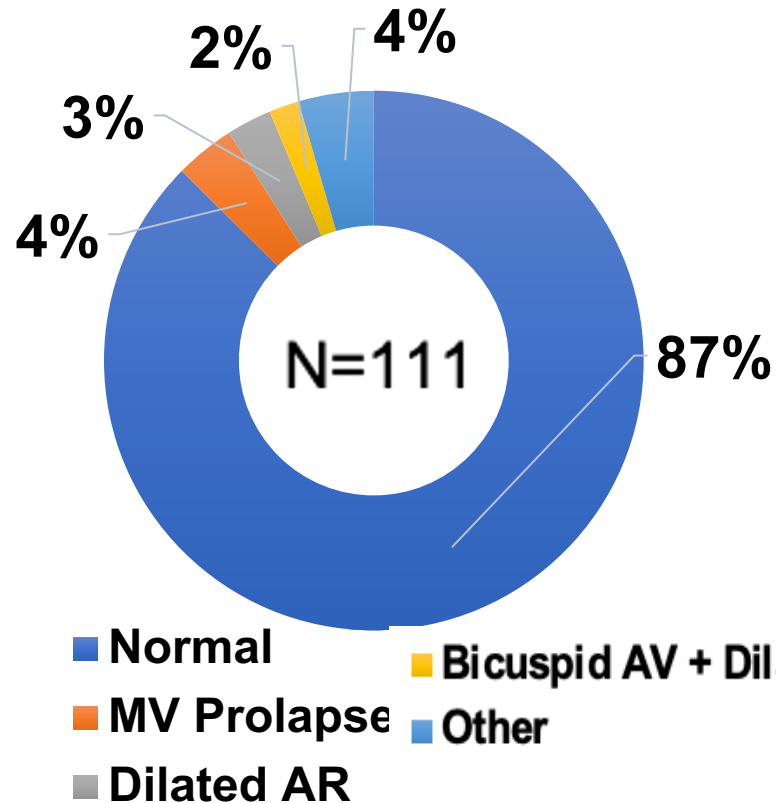
# RESULTS

## 64% Symptomatic

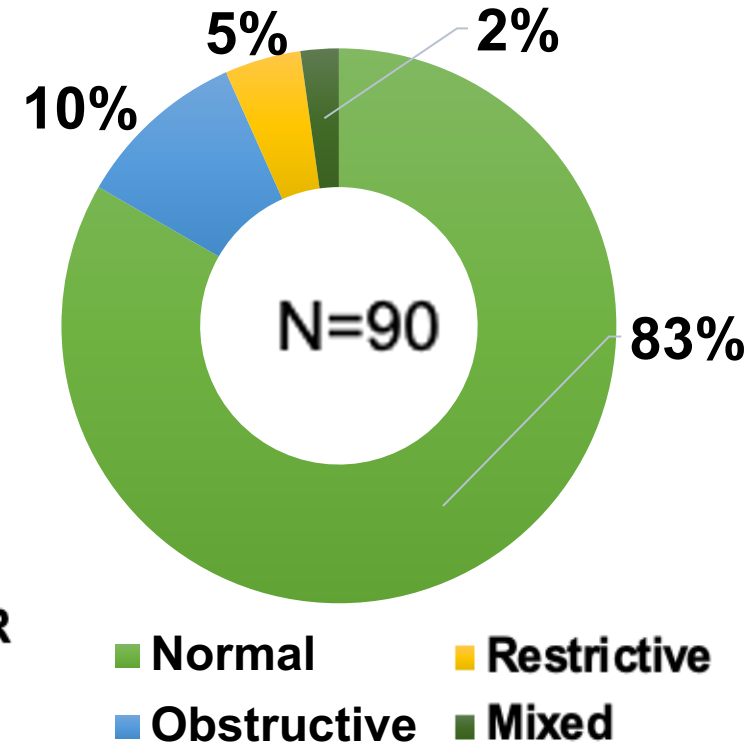
(No correlation with abnormal tests)



## 13% Abnormal ECHO



## 17% Abnormal PFT



-12/14 Abnormal ECHO required cardiology follow-up  
-None influenced surgical decision-making

**Table 1. Multivariate Analysis of Pectus Severity & Cardiopulmonary Results**

	<b>Abnormal PFT</b>	<b>Abnormal ECHO</b>
	Odds Ratio (95% CI)	Odds Ratio (95% CI)
<b>Haller Index</b>	1.81 (0.94-3.59)	2.50 (1.33-5.18)
<b>Correction Index</b>	2.20 (1.11-4.76)	2.00 (1.05-4.03)

**-Higher probability of abnormal PFT results if CI  $\geq$  42 or HI  $\geq$  4.5**

# CONCLUSIONS

- Prevalence of abnormal ECHO and PFT in patients undergoing Nuss procedure is low & does not correlate with symptoms.
- Increasing pectus severity is associated with higher likelihood of abnormal results.
- Routine ECHO is indicated to screen for cardiac anomalies requiring follow-up.
- Routine PFT is not indicated.

# CONTACT INFORMATION

**Olivia Ganescu, B.S.**

McGill Medical Student '21

Harvey E. Beardmore Division of Pediatric Surgery

The Montreal Children's Hospital

McGill University Health Care Centre

The Shriners Hospitals for Children

Canada



✉ sherif.emil@mcgill.ca (Senior Author)

✉ olivia.ganescu@mail.mcgill.ca

🐦 @DrSherifEmil

🐦 @OGanescu