# Evaluation of the time taken between aortic dissection presentation to the emergency department and definitive surgical intervention

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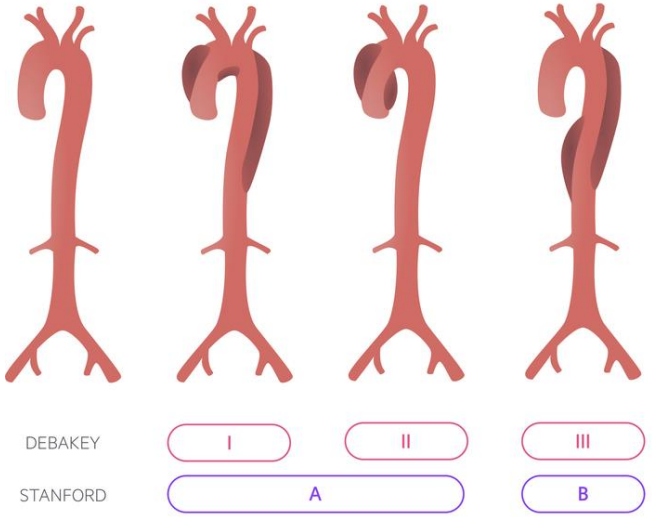
SCTS ANNUAL MEETING 2021

# Background

- Mortality risk increases by 1-3% every hour over the first 24 hours following Aortic dissection (AD) presentation and this is worsened by:
    1. Delayed diagnosis
    2. Sub-optimal initial medical management
    3. Delayed transfers to cardiothoracic centre and theatre




- The **Think Aorta** campaign was started in 2018 to create awareness and improve early diagnosis of AD.

# The Key Quality Indicators (KQIs) for AD Management

The KQIs are:

1. **Door to skin within 6 hours**
2. **Diagnosis within 4 hours of arrival**
3. **Early management**
    a. All the following:
        i. Labetalol infusion
        ii. Arterial line
        iii. Catheter
        iv. IV access
4. **Transfers**
    a. Transfer to centre and theatre within 2 hours

# Aim and Methods

- Primary objective: To evaluate the time taken between patients presenting at A&E and receiving life-saving surgery at a tertiary cardiothoracic centre to identify areas where delays can be reduced.
- Secondary objective: To evaluate whether introduction of Think Aorta Campaign reduced delay in diagnosis and management of aortic dissection
- We identified the length of three important time periods within the treatment pathway:
    1. **the diagnostic time** (between arriving at AED and receiving a CT scan)
    2. **the transfer time** (between receiving the scan and arriving at LHCH)
    3. **the on-site intervention time** (between arrival at LHCH and knife to skin)

# Results

**Baseline Demographics**

- 43 AD patients treated at LHCH between January 2018 and November 2019 were included in this study.

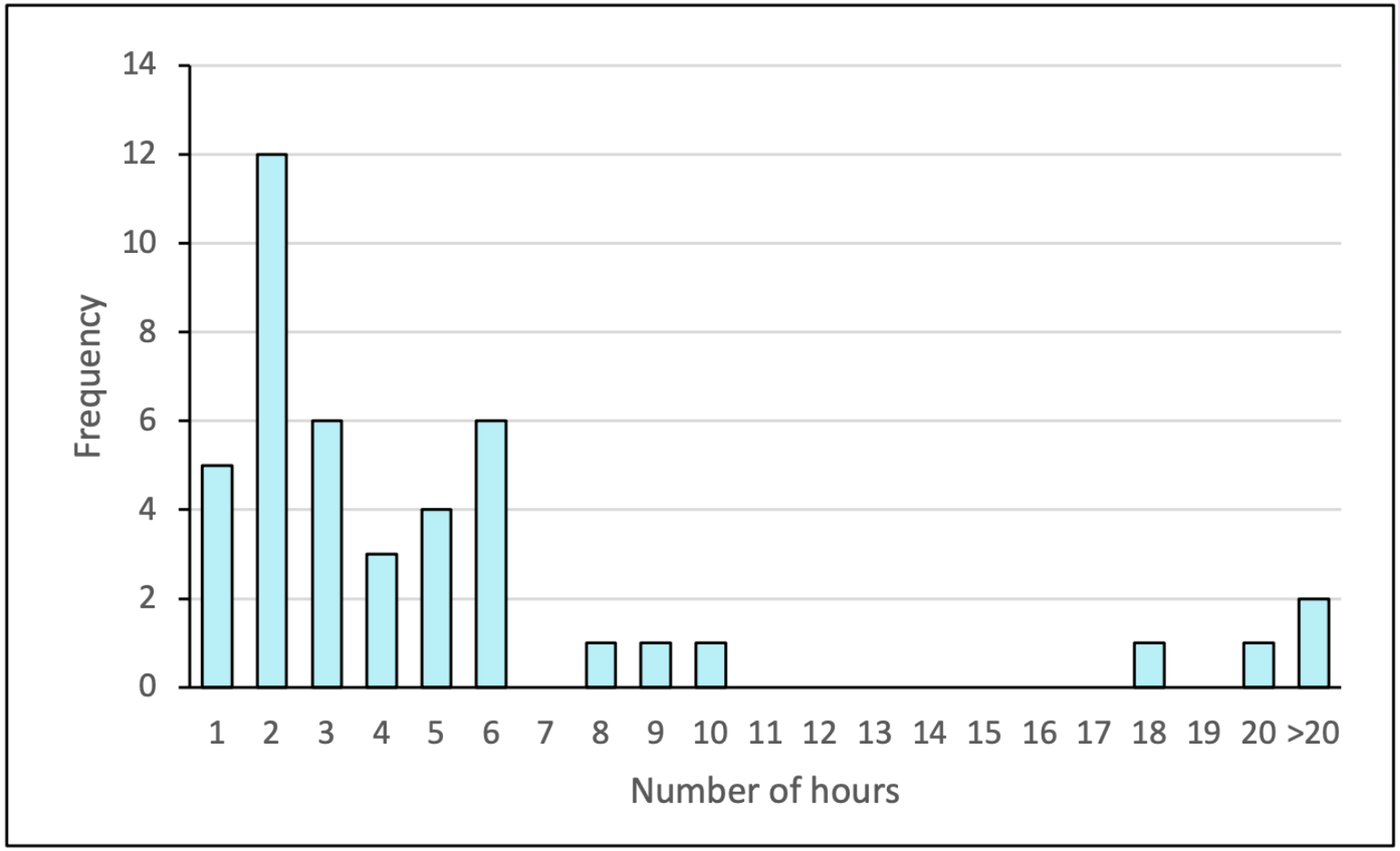



**Figure 1.** Time from admission to CT scan

# Results

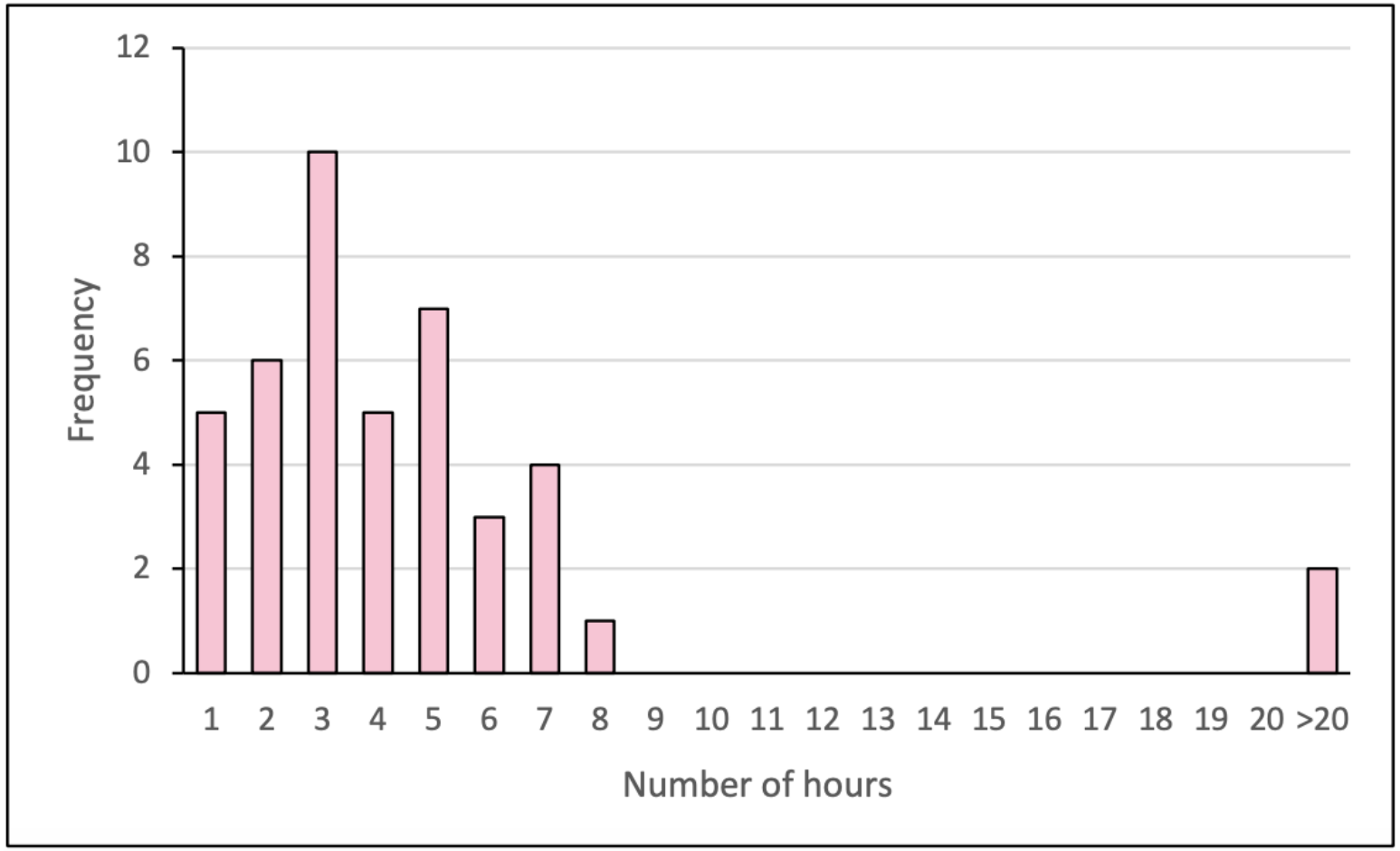



**Figure 2.** Time from CT scan to LHCH

# Results

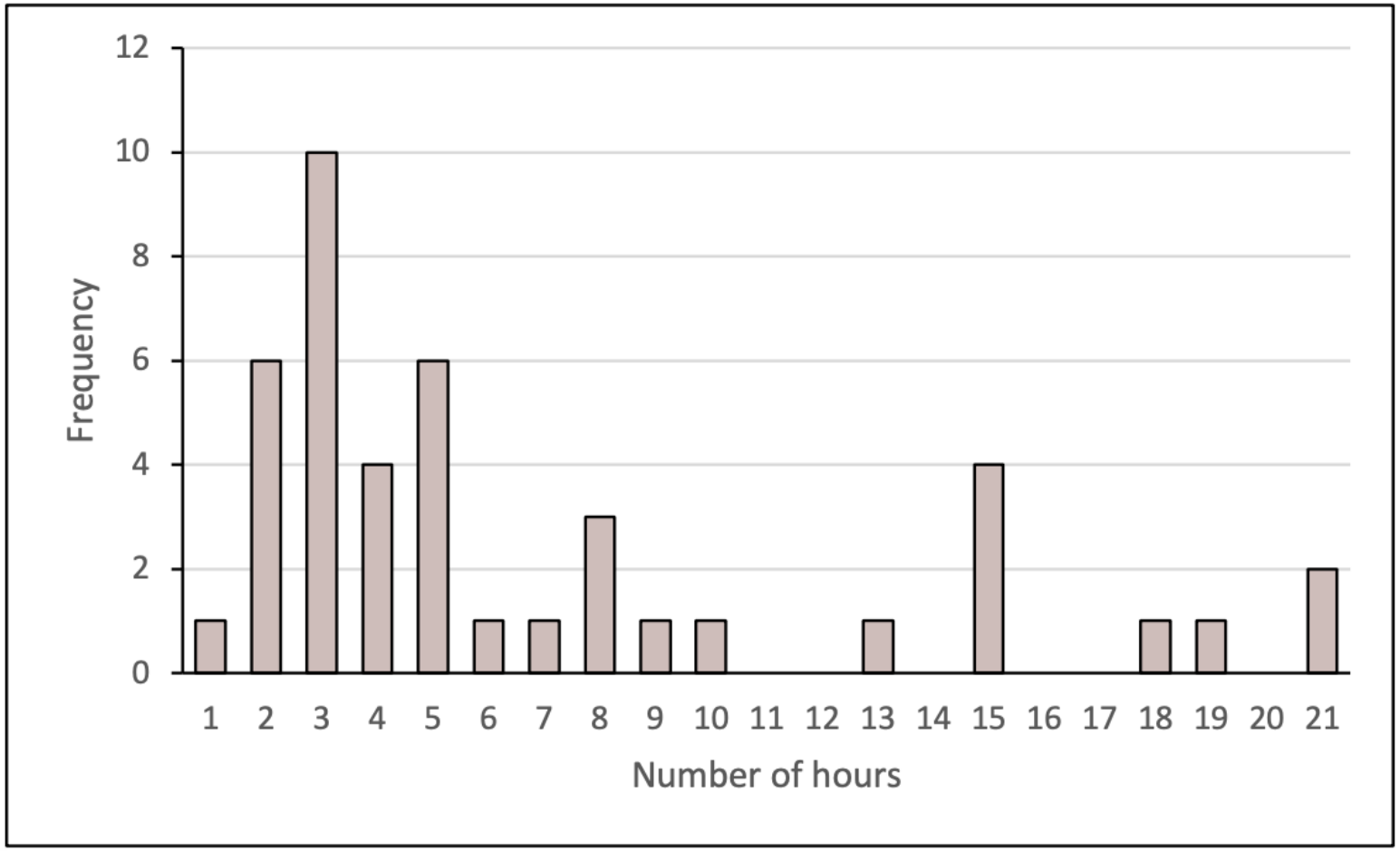
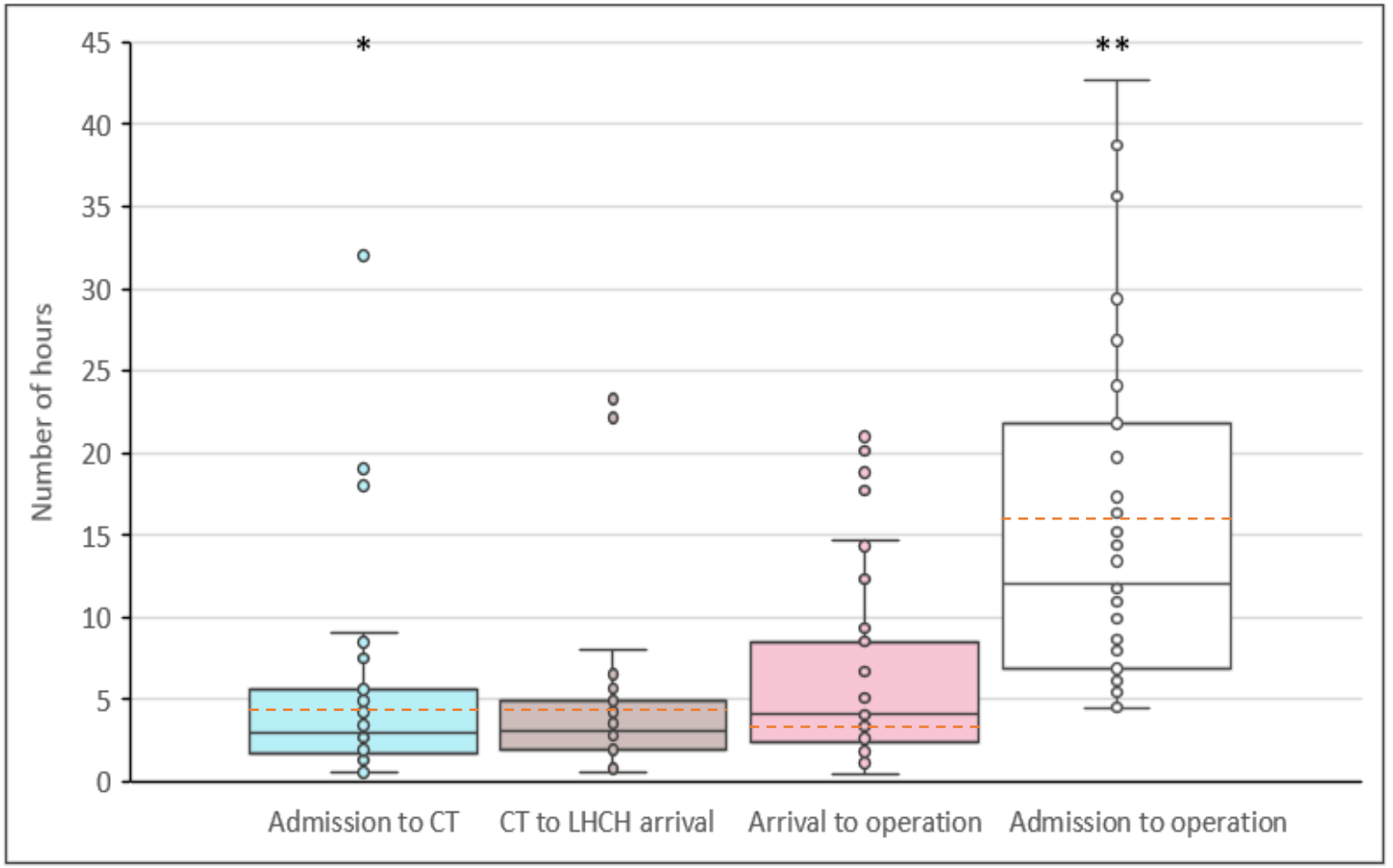



**Figure 3.** Time from arrival at LHCH to operation

# Summary of results




Orange dashed line indicates median from previous audit of 2004-2009 patient cohort

**Figure 4.** Box and whisker plot indicating time taken
* outlier at 120 hours
** outlier at 139 hours

# Discussion

**Correlates of Delayed Recognition and Treatment of Acute Type A Aortic Dissection by *Harris KM et al.* [Circulation 2011]**

- 894 patients from 24 centres
  - Median time from AED to diagnosis: 4.3hrs (range 1.5 – 24hrs)
  - Median time from diagnosis to surgery: 4.3hrs (range 2.4 – 24hrs)

- Who is most at risk of delay?
  A. During the diagnostic stage
     i. **Patients transferred from non-tertiary hospitals**
     ii. **Atypical AD symptoms or patients that did not present critically ill (hypotension, tamponade, signs of ischemia)**
  B. From diagnosis to surgery
     i. **Nonwhite patients**
     ii. **Hx of cardiac surgery (especially coronary artery bypass)**
     iii. **Prolonged time from presentation to diagnosis**

# Conclusion And Recommendations

- The average of 12 hours from presentation to surgery represents a greatly increased risk of death.
- The diagnostic and pre-operative stages may offer the best opportunities for review of procedures and interventions to expedite access to definitive surgical intervention.
- What can we do?
  - Awareness and Education
  - More testing
  - Regional protocols

# References


1. Debakey and Stanford classification: https://app.pulsenotes.com/surgery/cardiothoracics/notes/aortic-dissection
2. Acute Aortic dissection pathway and KQIs: https://www.lhch.nhs.uk/media/5727/acute-aortic-syndrome-pathway-v3.pdf
3. Harris KM, Strauss CE, Eagle KA, Hirsch AT, Isselbacher EM, Tsai TT, Shiran H, Fattori R, Evangelista A, Cooper JV, Montgomery DG, Froehlich JB, Nienaber CA; International Registry of Acute Aortic Dissection (IRAD) Investigators. Correlates of delayed recognition and treatment of acute type A aortic dissection: the International Registry of Acute Aortic Dissection (IRAD). Circulation. 2011 Nov 1;124(18):1911-8. doi: 10.1161/CIRCULATIONAHA.110.006320. Epub 2011 Oct 3. PMID: 21969019.