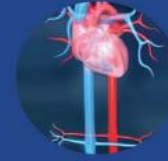




Aortic Symposium



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New York, NY, USA

Outcomes of Custodiol versus Blood Cardioplegic Agents in Patients Undergoing Major Aortic Surgery: a Propensity Score Matched study

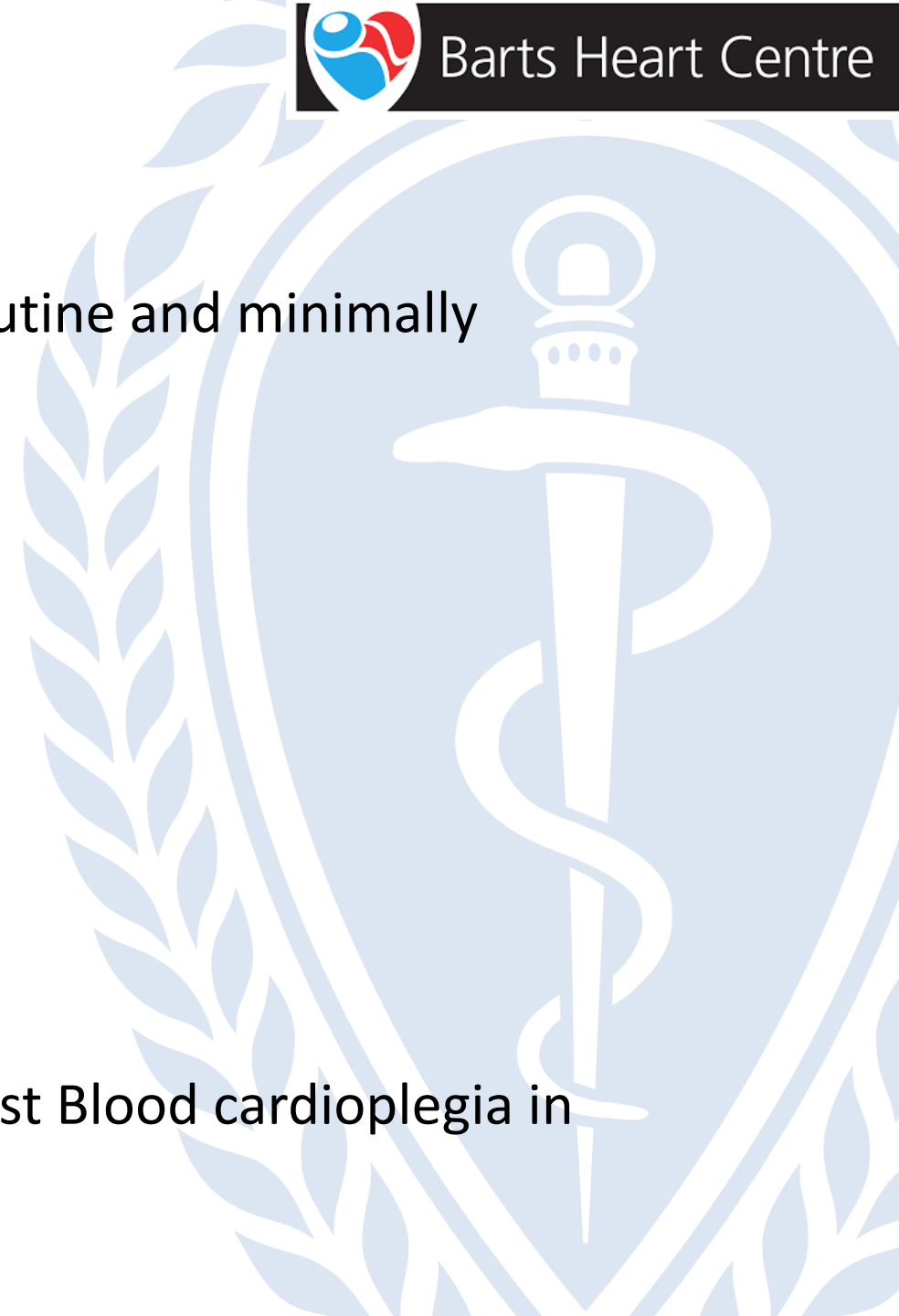
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Objectives

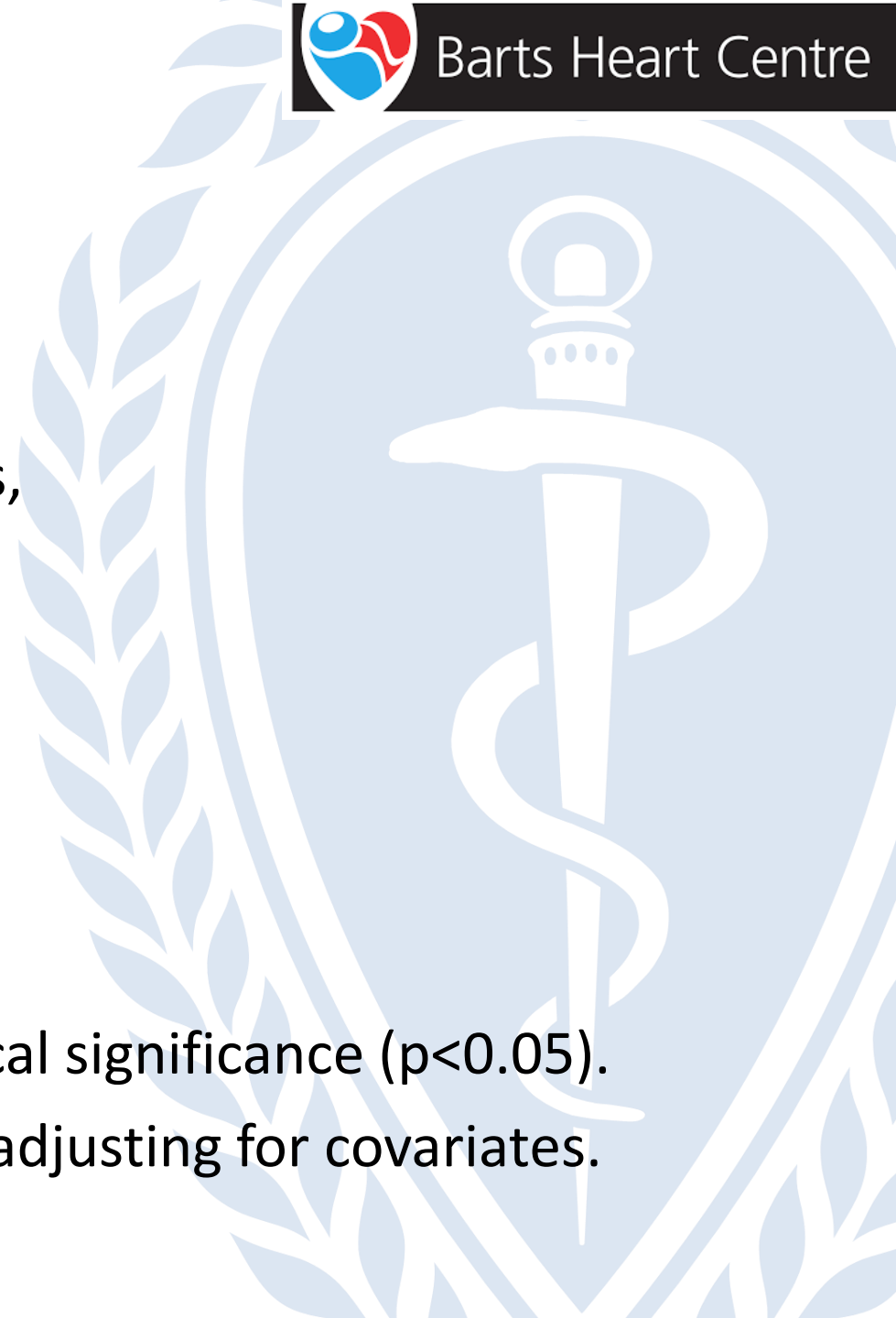
- Custodiol cardioplegia is well-established in routine and minimally invasive cardiac surgery
- Advantages
 - Prolonged myocardial protection
 - Single infusion
 - No interruptions to the operation flow.
- **Aim** -> compare the efficacy of Custodiol against Blood cardioplegia in patients undergoing major aortic surgery.



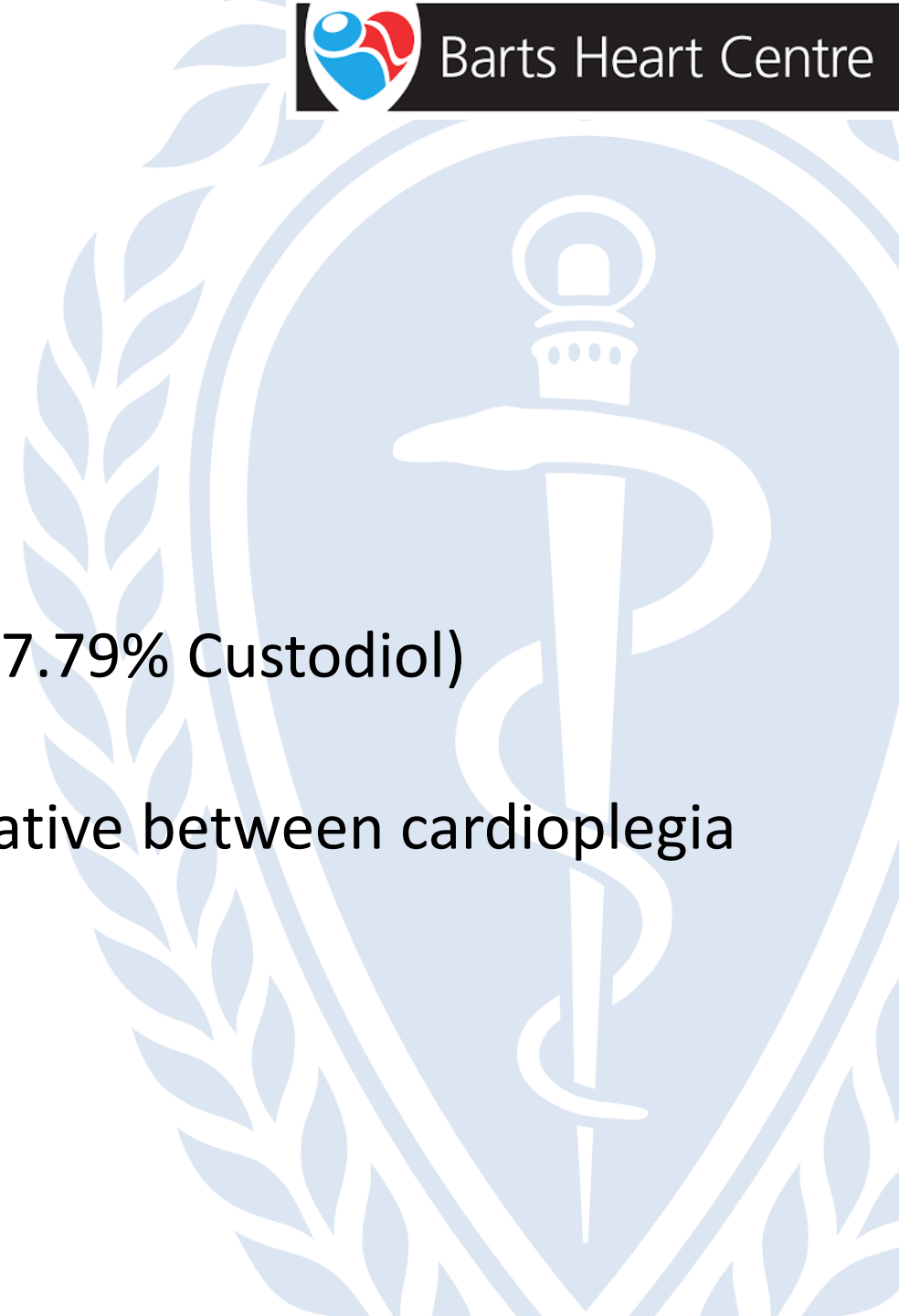
- Retrospectively analysed prospectively collated data
- Patients underwent major aortic surgery
- By two experienced aortic surgeons at a large specialist centre in the UK
- Between April 2022 and November 2023.

- 1:1 propensity score matched by age, gender and EuroScore II
- **45 Custodiol vs 45 Blood**
- All aortic operations were included, except for isolated aortic valve replacements.

- Reported outcomes include
 - operative data,
 - changes in blood and biochemistry results,
 - in-hospital mortality,
 - length of ICU stay
 - length of hospital stay,
 - adverse postoperative events.
- Continuous variables described as median
- Mann-Whitney U test to calculate for statistical significance ($p < 0.05$).
- Multivariable logistic regression model after adjusting for covariates.



- Mean age 59 years (both cohorts)
- 71% male (32/45 in each)
- High mean Euroscore II (7.74% blood and 7.79% Custodiol)
- No significant change in pre- to post-operative between cardioplegia for
 - Haemoglobin (p=0.14)
 - Sodium (p=0.16).



- **No significant difference** in postoperative outcomes between the two cohorts including:
 - return to theatre for bleeding ($p=0.50$),
 - postoperative stroke ($p=0.69$),
 - new acute kidney injury ($p=0.07$),
 - new pacemaker ($p=0.08$)
 - 30-day mortality (2 deaths in Custodiol, 3 in Blood, $p=0.65$).

Results

- **No statistically significant difference** between blood and custodial cohorts for
 - Cardiopulmonary bypass -> 225 vs 237 minutes ($p=0.07$)
 - Circulatory arrest times -> 59.5 and 58 minutes ($p=0.42$)
 - Cross-clamp time -> 163 vs 153 minutes ($p=0.83$)
- After adjusting for Euroscore II, urgency, redo surgery and operation type, a multivariable regression model reported
 - **No significant difference** in cross clamp time ($p=0.98$).
 - For **Redo operation** -> associated with an **average 44.3 minutes longer cross clamp time** which was significant ($p=0.002$).

- Sub-analysis of cross-clamp time between different operation types showed **Custodial** solution was:
 - **36 minutes significantly shorter** for **root** replacement (147.5 vs 183.5 minutes, **p=0.005**);
 - **16.5 minutes shorter** for ascending and hemiarch (146.5 vs 163 minutes, p=0.28)
- Majority of arch repair with Custodial were redo operations compared to blood cohort so unable to draw a meaningful analysis.

- After adjusting for covariates, **no statistically significant difference** between Blood and Custodial solutions for
 - duration of surgery ($p=0.98$),
 - mechanical ventilation ($p=0.28$),
 - ICU stay ($p=0.68$),
 - hospital stay ($p=0.81$)



Conclusions

- Custodiol cardioplegic solution
 - safe and effective myocardial protective agent
 - compared to traditional blood cardioplegia
 - in patients undergoing major aortic surgery.
- The reduced cross-clamp time was most significantly noticeable in patients receiving Custodiol during **aortic root replacements by 36min shorter clamp time**, without affecting postoperative outcomes.