

# Cognitive and Functional Trajectories Following Cardiac Surgery in Older Adults: A Five-Year Prospective Cohort Study

Authors Patrick F.M. Corbett<sup>1</sup>; Asma Sadoun<sup>2</sup>; Yuki Yoshimatsu<sup>1</sup>; Fionna E. Martin<sup>1</sup>; Philip Braude<sup>3</sup>; Judith S.L. Partridge<sup>1,4</sup>; Jugdeep K. Dhesi<sup>1,4</sup>

## Introduction

With a growing number of older adults undergoing cardiac surgery, there is increasing emphasis on recovery outcomes beyond morbidity and survival.<sup>1,2</sup> Many patients prioritise cognition and independence, yet these domains are not routinely assessed.<sup>3</sup> Frailty, multimorbidity and cognitive vulnerability are common in this population, increasing risk of poor longer-term outcomes.<sup>4</sup>

However, longitudinal evidence describing cognitive and functional trajectories after surgery remains limited. We characterised cognitive and functional trajectories of older cardiac surgical patients over 5 years.

### Objective:

- Characterise the long-term functional and cognitive outcomes of older adults undergoing elective CABG

## Methods

- Prospective cohort of adults  $\geq 60$  years undergoing elective CABG  $\pm$  valvular surgery.
- **Cognition:** Montreal Cognitive Assessment (MoCA), a screening tool for cognitive impairment.<sup>5</sup>
- **Function:** Nottingham Extended Activities of Daily Living (NEADL), measuring independence in daily tasks.<sup>6</sup>
- Assessments conducted at baseline, discharge, 6 weeks, 6 months and 5 years.
- **Analysis:** MoCA trends were analysed with linear mixed effects modelling; NEADL with the Friedman test.

Figure 1. MOCA trajectories over 5 years

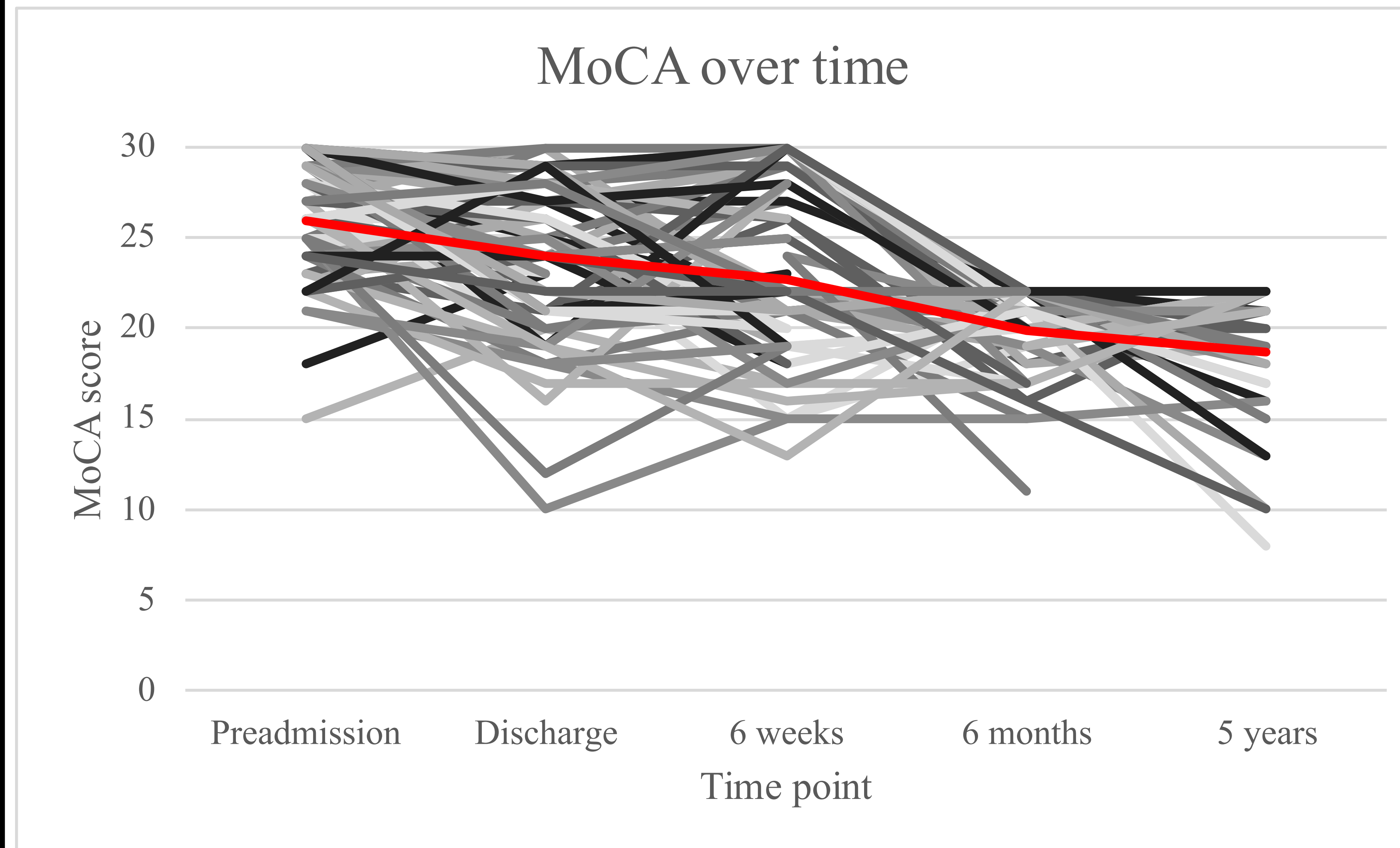
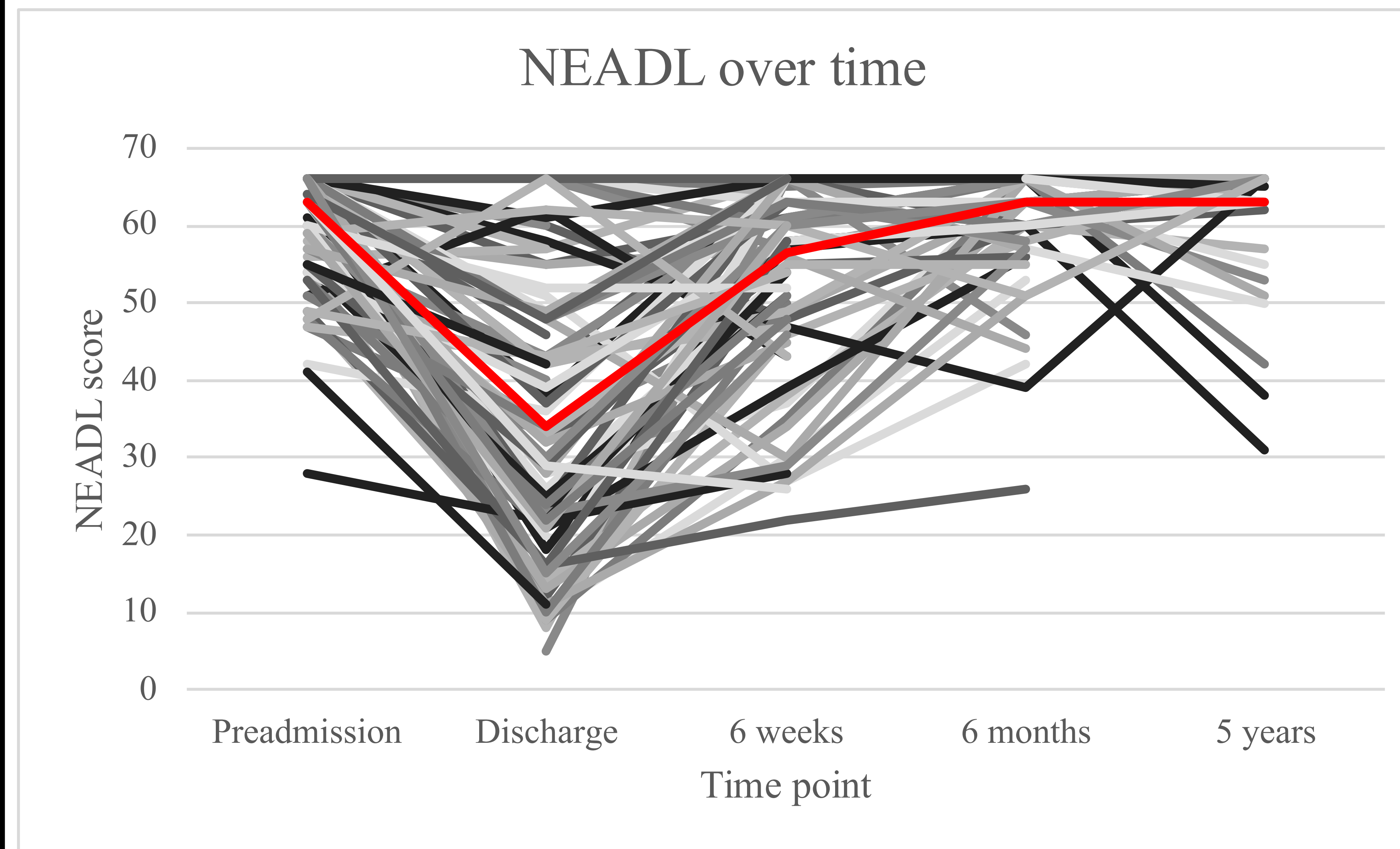


Figure 2. NEADL trajectories over 5 years



## Results

- 130 patients were assessed (mean age 69; 96 male, 34 female; median EFS 3). Of these, 98 underwent surgery and were included in outcome analyses.
- Cognition (MoCA): declined significantly over time ( $F(4, 79.95) = 123.86, p < 0.001$ ). Mean scores: 26.0 (baseline), 24.0 (discharge), 22.7 (6w), 19.9 (6m), 18.7 (5y) (Fig. 1).
- Function (NEADL): varied significantly ( $\chi^2(4) = 33.79, p < 0.001, n = 25$ ). Median scores: 60 (baseline), 34 (discharge), 55.5 (6w), 63 (6m & 5y) (Fig. 2).

## Conclusion

- After a sharp early decline, patients regained and surpassed baseline function by 6 months, and this was maintained at 5 years.
- In contrast, 93% experienced progressive cognitive decline, with significant reductions in MoCA at each follow-up.
- The decline exceeded expected age-related changes and aligns with evidence linking cardiac surgery to accelerated cognitive impairment.<sup>7,8</sup>

## Implications

- Gives patients and clinicians clear expectations for recovery and decline.
- Supports shared decision-making, especially for those valuing independence and quality of life.
- Functional recovery may be temporary setback which helps reframe early difficulties and reduce anxiety.
- Reveals a cognitive trade-off: long-term decline despite physical recovery.

References: 1. McVeigh TP, et al. *Int J Surg*. 2013;11(9):872-5; 2. Jones JM, et al. *Interact Cardiovasc Thorac Surg*. 2022;34(4):532-9; 3. WHO. *World Report on Ageing and Health*. 2015; 4. Partridge JSL, et al. *Age Ageing*. 2012;41(2):142-7; 5. Nasreddine ZS, et al. *J Am Geriatr Soc*. 2005;53(4):695-9; 6. Nouri F, et al. *Clin Rehabil*. 1987;1(4):301-5; 7. Hayden KM, et al. *Age Ageing*. 2011;40(6):684-9; 8. Bendikaite R, et al. *Heart Surg Forum*. 2020;23(5):E590-4.

Affiliations: <sup>1</sup> Guy's and St Thomas' NHS Foundation Trust, London; <sup>2</sup> GKT School of Medical Education, King's College London; <sup>3</sup> North Bristol NHS Trust, Bristol; <sup>4</sup> School of Population Health & Environmental Sciences, King's College London