

# Longitudinal Assessment of Neuropsychological Functioning in Children with Acute Lymphoblastic Leukemia (ALL) Treated on AALL1131: A Report from the Children's Oncology Group

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## NEUROCOGNITIVE OUTCOMES IN ALL

- 20-40% of ALL survivors experience cognitive decline
- Domains of particular risk
  - attention
  - working memory
  - processing speed
  - executive functioning
- Unanswered questions**
  - What is the earliest point at which problems can be detected?
  - How can we predict who will have problems?
  - How many children have significant difficulties?

## AALL1131 RESEARCH STRATEGY

- Maximize ability to obtain a large, representative sample of HR-ALL patients with multiple data points over time
- Minimize burden on participants and institutions
- Use brief, easy-to-administer measures given frequently during therapy

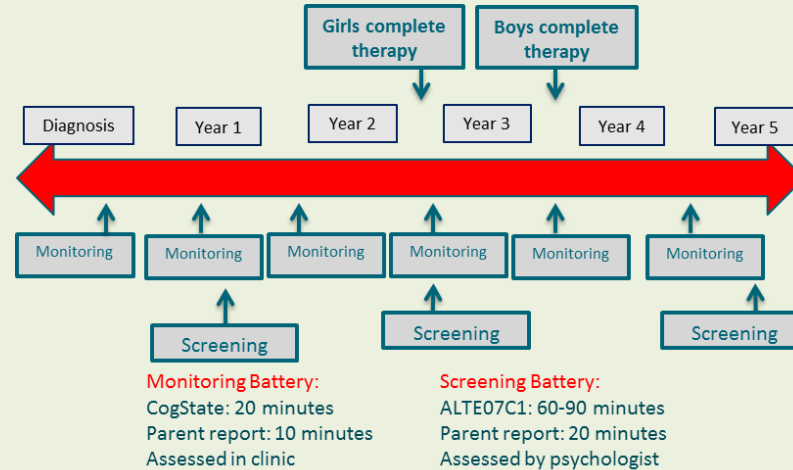
## AALL1131: NEUROCOGNITIVE OBJECTIVES

- AIM 1:** To determine if the prevalence of cognitive deficits in children (ages 6-11) with HR-ALL is significantly higher than the normative population
- AIM 2:** To determine if there are significant declines in neurocognitive functioning in children with HR-ALL

## PARTICIPANTS

- Children enrolled on the COG High Risk B-precursor ALL trial (AALL1131) aged 6 – 11 years at time of diagnosis.
- Exclusion criteria: premorbid neurodevelopmental disorder, or significant motor, auditory, or visual impairment.

**FIGURE 1: Cognitive assessment strategy**



## MEASURES: Monitoring battery

- CogState** – Computerized assessment of reaction time, sustained attention, working memory, and executive functioning
- BRIEF** – Parent-completed paper-and-pencil measure of children's impairments in executive functioning

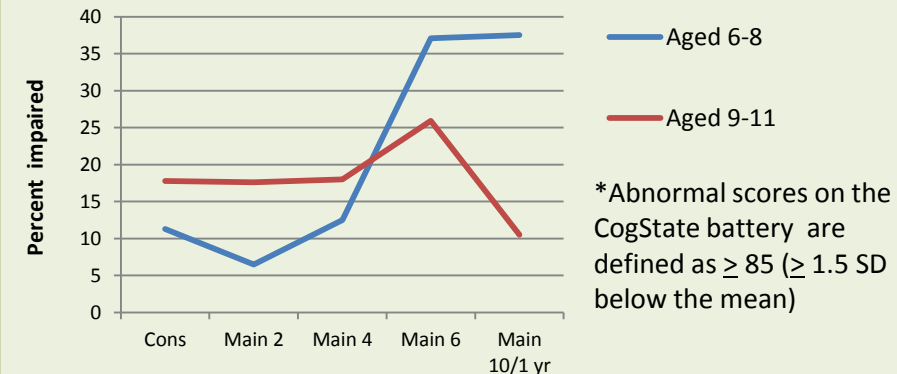


Fig 2: Identification task. Children push the "yes" button if the card is red, and the "no" button if it is not red.

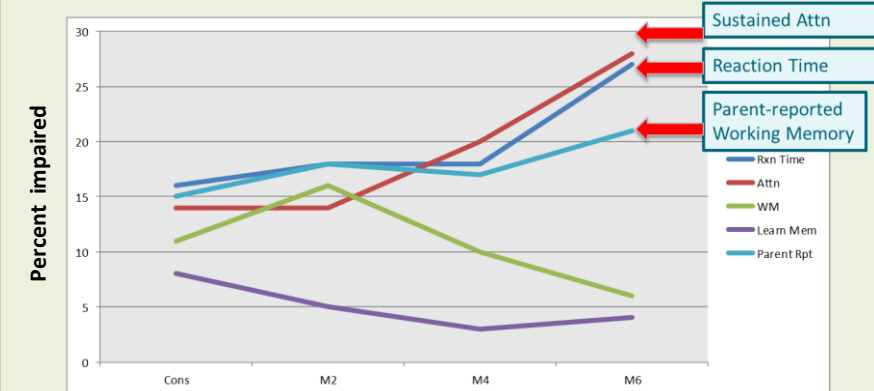
## RESULTS

- 376 participants have been enrolled (52% male, Mean age at diagnosis = 9.20)
- Data collection rates range from 78% to 94% across time points
- 85% of participants are remaining on study over time

**FIGURE 3: Abnormal attention scores\* by age at diagnosis**



**FIGURE 4: Abnormal scores\* over time**



## CONCLUSION

- Early identification of cognitive difficulties may allow for targeted intervention at the earliest possible time point.
- Screening battery data will allow us to better understand intellectual outcomes and adaptive impairments and their relation to earlier deficits as identified by the Monitoring battery.