DIRECTORS: Sandra A. Brown
& Susan Tapert

DAR DIRECTORS: Adolf Pfefferbaum
& Kilian Pohl

INVESTIGATORS: Susan Tapert, Edith Sullivan, Fiona Baker,
Duncan Clark, Ian Colrain, Michael De Bellis, Bonnie
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NCANDA ORGANIZATIONAL STRUCTURE

Administrative Resource
MPI: Sandra Brown (Coordinator) & Susan Tapert
Associate Directors: Bonnie Nagel & Duncan Clark
Marc Schuckit, Ty Brumback, Patrick Mercier, Kara Bagot

Data Resource
MPI: Adolf Pfefferbaum & Kilian Pohl
Edith Sullivan, Rosemary Fama, Eric Peterson,
Wesley Thompson, Dongjin Kwon, Eva Müller-Oehring

Steering Committee
Chair: Sandra Brown
Duncan Clark, Ian Colrain, Michael De Bellis,
Bonnie Nagel, Adolf Pfefferbaum,
Edith Sullivan, Susan Tapert, Ben Xu

Scientific Advisory Board
Chair: Ken Sher
Arpana Agrawal, Andrea Hussong,
Edythe London, María Luisa Zúñiga

DUKE
PI: Michael De Bellis
James Voyvodic
Kate Nooner

OHSU
PI: Bonnie Nagel
Damien Fair, Chris Kroenke,
Sarah Feldstein-Ewing

PITTSBURGH
PI: Duncan Clark
Tammy Chung, Beatriz Luna,
Chris Martin, Peter Franzen

SRI
MPI: Fiona Baker & Ian Colrain
Massimiliano de Zambotti,
Devin Prouty

UC San Diego
PI: Susan Tapert
Ty Brumback, Tom Liu

Committees
Workgroups
SOPs
1. Effects of alcohol on neurodevelopment trajectories
2. Effects of timing, dose, duration on brain development
3. Malleability of effects with abstinence
4. Biopsychosocial factors and neurodevelopment
   • Sex
   • Trauma
   • Puberty
   • Sleep
   • Family history alcoholism
5. Risk, protective & resilience factors of addiction & psychopathology
6. Implications for education, prevention and intervention
ACCOMPLISHMENTS

- Targeted sample recruitment & follow up — transitioning into and through high risk age (sufficient use rates)
- Accessible data bases – open science model
- High quality, stable support staff
- Rigorous training and fidelity assurance (multiple site visits)
- Productive: 17 publications, 23 presentations & 21 trainees
- Interface with other large scale efforts (NADIA; COGA)
- Emerging new findings and separate practice effects from developmental neuropsych effects with our age range
- Multisite measurement, methods and analytic advances
DESIGN FEATURES

- Accelerated longitudinal design
- Replicability of science:
  - Each specialty projects at 2+ sites
  - Each MRI platform (GE, Siemens) at 2+ sites
- Developmental hypotheses
- Scientific and clinical expertise and experience at each site (for emergent issues)
- Data integration and meticulous data hygiene
- Quality control & results based accountability metrics: Standardized battery, training, protocol, measurement, ongoing monitoring (Annual site review/ human phantom visits)
NCANDA RECRUITMENT

Enriched sample
2500 screened - 1400 eligible - 831 selected

Major risk factors:
1. FH alcohol use disorder
2. 1+ externalizing symptoms
3. 2+ internalizing symptoms
4. First drink < age 15

50% endorsed risk
• 30% 1 risk factor
• 20% 2+ risk factors

5 Sites
>50,000 reached via school and community recruitment

>7,500 responded

831 enrolled

692
No or Limited Drinking Experience 85%

139
Mod. Drinking Experience 15%

3 annual follow-ups (~25% heavy drinkers)
SUCCESSFUL FOLLOW UP MAINTAINS REPRESENTATIVE SAMPLE

**Racial/Ethnic Distribution of NCANDA**

- White: 65%
- Afr.-Am.: 12%
- Hispanic: 11%
- Asian: 8%
- Bi-/Multi-racial: 4%
- Pac. Is.: 0%
- Nat. Am./Am. Ind.: 0%

**Follow Up Rates**

- Interviews:
  - Baseline: 100%
  - Year 1: 94%
  - Year 2: 89%
- MRIs:
  - Baseline: 100%
  - Year 1: 87%
  - Year 2: 80%

**Minimal withdrawals (<3%); equally distributed over demographics and substance use**

**Baseline = Follow up**

**Demographics** = local demographics at sites

& Using sample = Non users at baseline

**Hi Risk** = slightly higher AA & Hispanics
EXPANDING AGE RANGE OF ACCELERATED LONGITUDINAL DESIGN

NCANDA2 doubles observations in critical age range
- Binge
- Onset AD
- Onset SUD
- Onset MH
Substance use increases as anticipated with age, Baseline to Y2:

- Nicotine: 12% to 22%
- MJ: 19% to 38%
- Amphetamines: 1% to 4%
- Ecstasy: 1% to 3%

Darker lines = No use at baseline
HEAVY EPISODIC DRINKING ONSET INCREASES WITH AGE, VARIES OVER TIME

Overall increased drinking, with individual variation over time:
- 13% had >10 binges at Y2
Comprehensively assess well described sample of youth through the **highest risk period of heavy use** to examine impact of alcohol (other substances) on neurodevelopment.

Address primary aim of evaluating characteristics of alcohol (other drugs) **exposure on brain, cognition, developmental trajectories, outcomes and problems commonly emerging during adolescence**.

Develop **methods and technologies** for more refined imaging metrics and measures of alcohol measurement in the **natural environment** to aid hypothesis driven science.
Opportunities with this sample:

- Aging through highest risk period
- Expected natural reductions in use levels

Analytic opportunities:

- Better powered to determine how alcohol and other substance use may alter neurodevelopment
- Risk profiles – variability in trajectories?
- Excellent prevention education information