

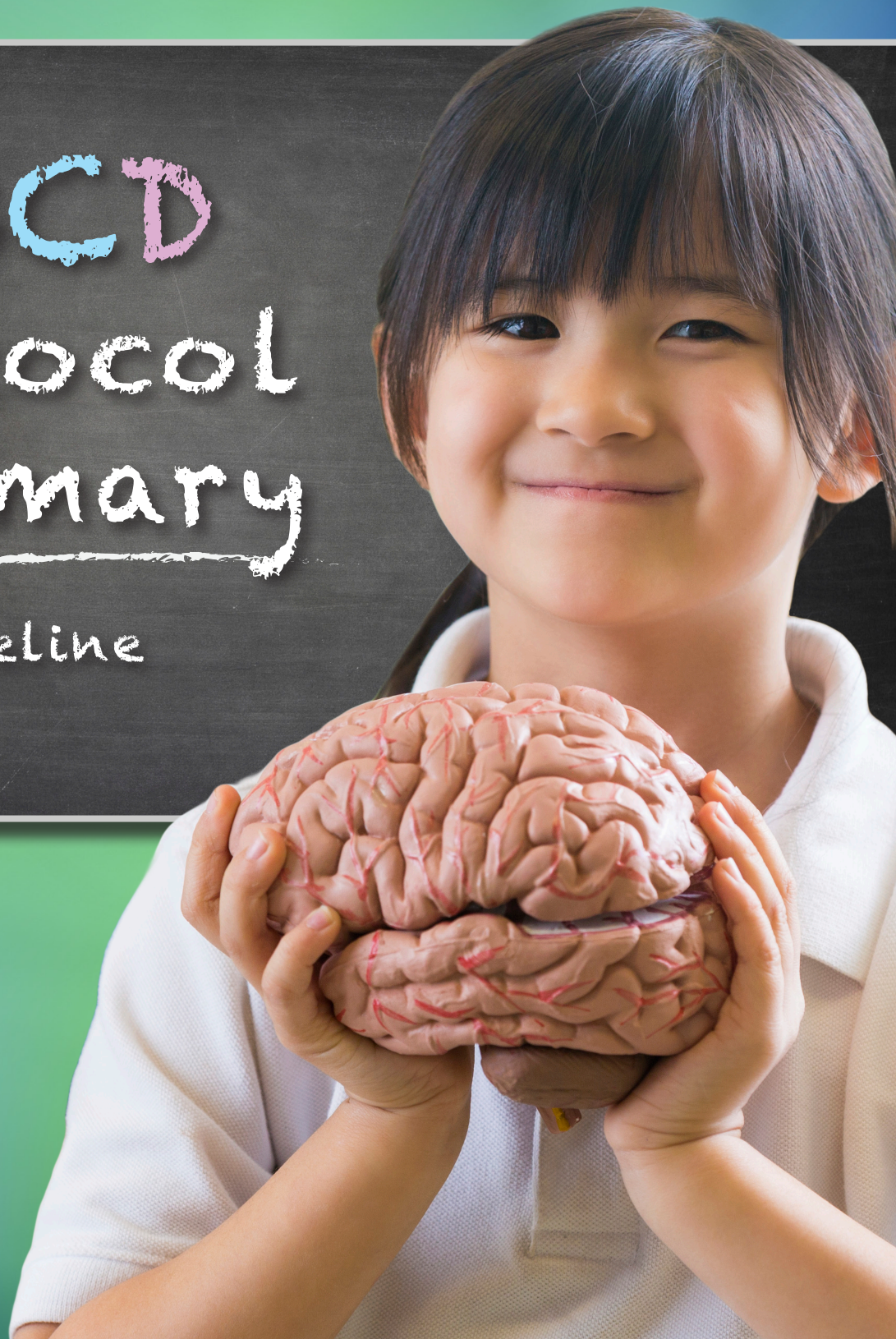


Adolescent Brain Cognitive Development®

Teen Brains. Today's Science. Brighter Future.

ABCD Protocol Summary

Baseline



The Adolescent Brain Cognitive Development (ABCD) Study

The ABCD Study is the largest long-term study of brain development and child health in the United States. The ABCD Research Consortium consists of a Coordinating Center (CC), a Data Analysis and Informatics Center (DAIC), and 21 research sites across the country (see map), which will invite more than 10,000 children ages 9-10 to join the study. Researchers will track their biological and behavioral development through adolescence into young adulthood.

The ABCD CC, DAIC, and Consortium Workgroups have established standardized and harmonized assessments of physical and mental health, neurocognition, substance use, and culture and environment. They also have established multimodal structural and functional brain imaging and bioassay protocols. Brain imaging and biospecimen collection for genetic and epigenetic analyses will be done every other year, and the remaining assessments will be conducted semi-annually or annually.

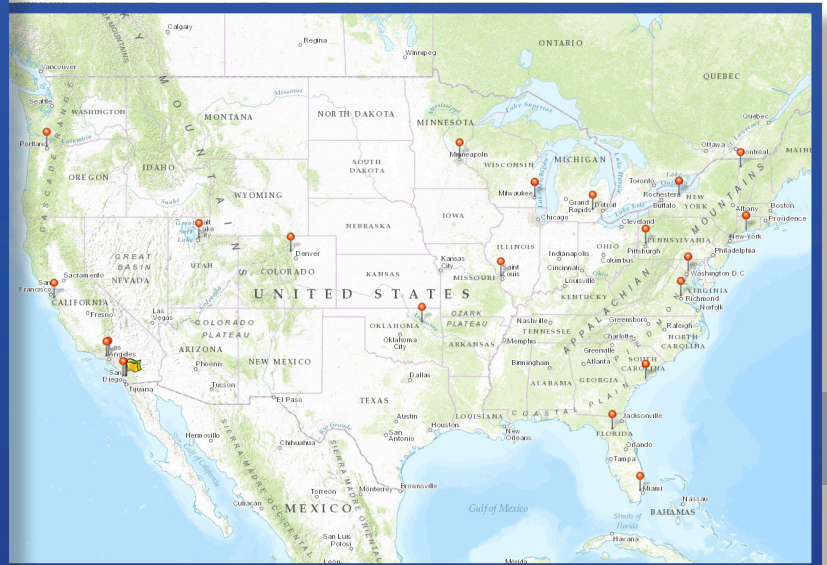
ABCD Open Science Model

One goal of the multisite longitudinal ABCD Study is to create a unique data resource for the entire scientific community by embracing an open science model. Curated data are released annually through the NIMH Data Archive (<https://data-archive.nimh.nih.gov/>), beginning in 2018 with an interim release that includes high quality baseline data from the first ~4500 participants. Information on how to access ABCD data is available on the website.

Sharing ABCD data in this way will allow scientists from all over the world to conduct analyses, pool resources, and enrich the value of this study by rapidly expanding the types of scientific questions answered.

Locations of ABCD Research Sites in the United States

	Coordinating Center	University of California, San Diego
	Data Analysis and Informatics Center	University of California, San Diego
	Research Sites	Children's Hospital of Los Angeles Florida International University Laureate Institute for Brain Research Oregon Health & Science University SRI International University of California, Los Angeles University of California, San Diego University of Colorado University of Florida University of Maryland University of Michigan University of Minnesota University of Pittsburgh University of Rochester Medical University of South Carolina University of Utah University of Vermont Virginia Commonwealth University Washington University in St. Louis University of Wisconsin-Milwaukee Yale University



Physical Health

ABCD Baseline Measure	What it measures:	Youth (min)	Parent (min)
Anthropometrics*	Height, weight, waist circumference	5	
Snellen Vision Screener	Vision screening	2	
Edinburgh Handedness Inventory	Handedness; Laterality quotient	1	
Youth Risk Behavior Survey: Exercise	Physical exercise	2	
Pubertal Development Scale and Menstrual Cycle Survey	Pubertal stage and menstrual phase	2	6
Screen Time Survey	Screen time utilization	3	2
Demographics Survey*	Demographics, race, gender, family structure, SES, education and occupation		5
Medical History Questionnaire	Medical history and health services utilization		10
Developmental History Questionnaire	Prenatal exposure by trimester - medications, drugs, alcohol, tobacco		15
Medications Survey*	Current and past medications		5
Sleep Disturbance Scale for Children	Sleep and sleep disorders		5
Sports and Activities Involvement Questionnaire	Involvement in sports, music, and hobbies, TBI risk		10
Ohio State TBI Screen - Short	Traumatic brain injury of youth		5
	Total Minutes	15	63

*Modified from PhenX

Mental Health

ABCD Baseline Measure	What it measures:	Youth (min)	Parent (min)	Parent 2 (min)
Kiddie Schedule for Affective Disorders and Schizophrenia (KSADS-5)				
Background Items Survey	Youth: school, sexual orientation	2		
	Parent: school, family, social relations		5	
Diagnostic Interview for DSM-5	Youth: mood, social anxiety, generalized anxiety disorder, suicide, sleep	13		
	Parent: all modules		60	
UPPS-P for Children - Short Form (ABCD version)	Impulsivity	3		
Behavioral Inhibition/Behavioral Approach System (BIS/BAS) Scales*	Inhibition and reward seeking	3		
Prodromal Psychosis Scale	Prodromal psychosis level	8		
Youth Resilience Scale	Resilience (friends)	1		
Child Behavior Checklist	Dimensional psychopathology, adaptive functioning		10	
Parent General Behavior Inventory - Mania	Subsyndromal mania		5	
Adult Self Report	Parent dimensional psychopathology		10	10
Family History Assessment	Family history of psychopathology and substance use (for biological or adoptive parent)		15	
Total Minutes		30	105	10

*Modified from PhenX

Substance Use

ABCD Baseline Measure	What it measures:	Youth (min)	Parent (min)
Participant Last Use Survey (PLUS)	Tobacco/caffeine/medication usage in the last 24 hours	1	1
Parent Rules	Parental substance use approval and rules		3
Community Risk & Protective Factors*	Perceived availability		2
Heard of alcohol, tobacco/nicotine, marijuana, other:			
Peer Group Deviance*	Peer group deviance & influences	1	
PATH Intention to Use Tobacco Survey	Intention to use, susceptibility	1	
Having tried alcohol, tobacco/nicotine, marijuana (e.g., sip or puff):			
Timeline Follow-back Survey	Quantity/frequency of all substance use	3-20	
iSay II Q2 Sipping Items	Early alcohol use	1	
Tobacco Low-Level Use Measure	Early tobacco use	1	
Marijuana Low-Level Use Measure	Early marijuana use	1	
Caffeine intake (only if heard of caffeine)	Caffeine use, type & quantity	1	
Having ever used alcohol, tobacco/nicotine, marijuana, other (e.g., full drink, more than just a puff):			
Acute Subjective Response to Alcohol*	Sensitivity to alcohol effects	2	
Acute Subjective Response to Tobacco*	Sensitivity to tobacco effects	1	
Acute Subjective Response to Marijuana	Sensitivity to marijuana effects	1	
Having two or more occasions of the respective substance use in past six months:			
Hangover Symptom Scale	Alcohol use consequences	3	
Rutgers Alcohol Problem Index	Alcohol use consequences	2	
Nicotine Dependence (from PATH)	Nicotine use consequences	2	
Marijuana Problem Index	Marijuana use consequences	2	
Drug Problem Index	Substance use consequences	2	
Total Minutes		1-42	6

*Modified from PhenX

NeuroCognition

ABCD Baseline Measure	What it measures:	Youth (min)
NIH Toolbox Tasks		
Picture Vocabulary	Language: vocabulary knowledge, estimated verbal IQ	4
Flanker Inhibitory Control and Attention	Attention, cognitive control; executive function; inhibition of automatic response	4
List Sorting Working Memory	Working memory, information processing	8
Dimensional Change Card Sort	Executive function: set shifting, flexible thinking; concept formation	6
Pattern Comparison Processing Speed	Information processing; processing speed	3
Picture Sequence Memory	Episodic memory; sequencing	7
Oral Reading Recognition	Language: oral reading (decoding) skills, academic achievement	3
Rey Auditory Verbal Learning Test	Learning and memory	9
Cash Choice Task	Motivation, disinhibition, risk-taking, impulsivity	1
Little Man Task	Visuospatial processing, flexibility, attention	6
Matrix Reasoning Task	Fluid intelligence; visuospatial reasoning	8
RAVLT Delayed Recall	Memory recall	1
Total Minutes		60

Culture & Environment

ABCD Baseline Measure	What it measures:	Youth (min)	Parent (min)
Parental Monitoring Survey	Parental monitoring/supervision	1	
Acceptance Subscale from Children's Report of Parental Behavior Inventory (CRPBI) - Short	Environment - Family & Religion	2	
School Risk & Protective Factors Survey*	Risk and protective factors	1	
Prosocial Behavior Survey	Resilience	1	1
Acculturation Survey*	Cultural factors	1	1
Family Environment Scale - Family Conflict Subscale*	Family dynamics, cohesion, expressiveness, conflict	2	2
Neighborhood Safety/Crime Survey*	Risk and protective factors, crime	1	1
Vancouver Index of Acculturation - Short Survey	Acculturation		5
Multi-Group Ethnic Identity - Revised Survey	Cultural affiliation		2
Mexican American Cultural Values Scale	Familism, religion, independence, self-reliance		5
Native American Acculturation Scale	Tribal affiliation (for Native American Parents only)		5
Total Minutes		9	22

*Modified from PhenX

Brain Imaging Protocol

ABCD Scan Module	Protocol	Youth (min)
Pre Scan (outside scanner)	Day of Scan Additional MR Screening*	1
	MR Simulator with motion compliance while practicing tasks	20-30
	Pre Scan Questionnaire	1
Scan (inside scanner)	Setup	3-6
	Localizer	1.5
	3D T1 (show child movie)	6.5-8
	fMRI Field Map	0.25
	rsfMRI: 2-5 min. runs with 10 sec. film clip between runs [^]	10
	Diffusion Field Map	0.25
	DTI (show child movie)	9-10
	3D T2 (show child movie)	6-7
	fMRI Field Map	0.25
	rsfMRI: up to 2- 5 min. runs with 10 sec. film clip between runs [^]	5-10
	fMRI Field Map	0.25
	fMRI Monetary Incentive Delay Task (2-5.5 min. runs)	12
	fMRI Field Map	0.25
	fMRI Stop Task (2-5.75 min. runs)	13
	fMRI Field Map	0.5
	fMRI Emotional N-Back Task	12
Post Scan (outside scanner)	Post Scan Questionnaire- on iPad	1
	Recognition Memory for Emotional N-Back Task	11
	Monetary Incentive Delay Task Survey	2
Total Minutes		116-137

*To be completed by Parent and Child at screening, at scheduling, and at scan. All other measures Child only
[^]To avoid fatigue, sleep, compliance problems will show 10-20 sec. movie clips between each 5 min. rsfMRI run

Biospecimens

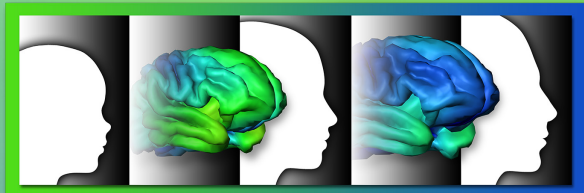
ABCD Baseline Bioassay	What It Measures	Method	Youth (min)	Parent (min)
Alcohol Screen*	Past day alcohol use	Breathalyzer	1	
Drug Screen*	Past day drug use	Oral fluid - Drager	1	
Substance Use History	Metabolites of past 3 month substance use	Hair (~100 strands)	5	
Pubertal Hormones	Estradiol, testosterone, and DHEA	Oral fluid	7	
DNA (bank)	Genetic and epigenetic factors	Oral fluid/blood*	8-10	
Baby Teeth	Substance and environmental toxin exposure	Prior/newly shed baby teeth		5
Total Minutes			22-24	5

*Subset of participants

Other Data Sources

ABCD Baseline Measure	What it measures:	Parent (min)	Teacher (min)
Geocoding from Residential History	Environmental risk	5	
School Records	Educational attainment	3	
Brief Problem Monitor - Teacher Form	Dimensional psychopathology, adaptive functioning		2
Total Minutes		8	2

*Subset of participants



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