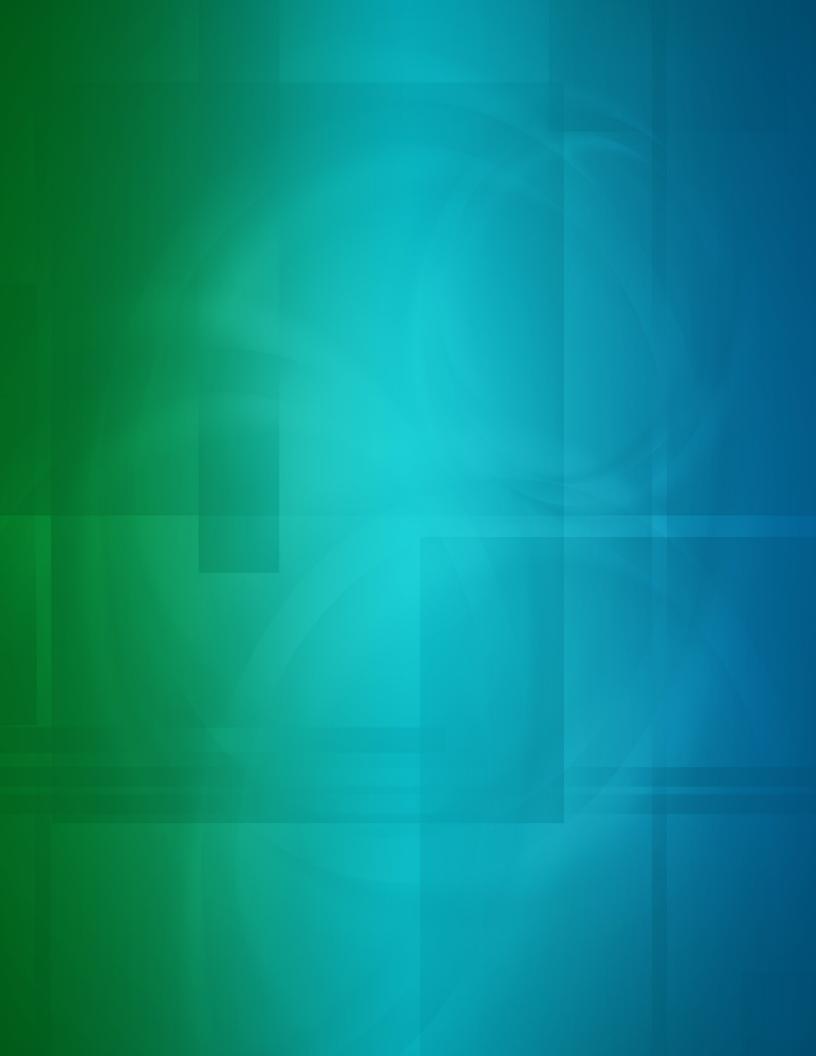
PROTOCOL SUMMARY

VISIT 4: 9-15 MONTHS



HEALthy Brain and Child Development Babies · Brains · Bright Futures

HBCDStudy.org



The HEALthy Brain and Child Development Study

The HBCD Study is the largest longitudinal study of early brain and child development in the United States. Knowledge gained from this research will have lasting impacts on future generations of children.

This ambitious project will enroll over 7,000 participating families from across the United States and follow them from pregnancy through early childhood. The HBCD Research Consortium consists of the HBCD Consortium Administrative Core (HCAC), the HBCD Data Coordinating Center (HDCC), and 27 recruitment sites across the country (see map).

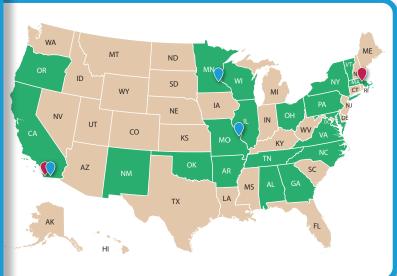
Leading researchers in the fields of child development and neuroscience will work with participating families and their children to understand how the brain develops and how exposure to substances and other environmental, social, and biological factors during pregnancy and after birth impact outcomes.

HBCD Open Science Model

The data generated in the study will be made broadly available to the research community through an open science model and serve as a resource to support numerous additional studies and foster new hypotheses to be explored.

Locations of HBCD Recruitment Sites in the United States

Sites	Cedars-Sinai Medical Center Children's Hospital of Los Angeles Children's Hospital of Philadelphia Cincinnati Children's Hospital Emory University Johns Hopkins University/Kennedy Krieger Institute New York University School of Medicine Northwestern University Oklahoma State University Center for Health Sciences Oregon Health & Science University Pennsylvania State University-University Park Pennsylvania State University College of Medicine University of Alabama at Birmingham University of Alabama at Tuscaloosa University of Arkansas for Medical Sciences University of Maryland University of Morth Carolina Chapel Hill University of North Carolina Chapel Hill University of Wisconsin-Madison University of California, San Diego Vanderbilt University Virginia Tech Washington University	WA OR NV CA AK
НСАС	University of California San Diego Boston Children's Hospital Harvard Medical School	
HDCC	University of California San Diego University of Minnesota Washington University	



9-15 Months of Age

HBCD Measure	What it Measures	Child (min)	Adult (min)			
Adult Health						
American Psychiatric Association (APA) DSM-5 Level 1	Current mental health symptoms, including depression, anxiety, sleep problems, memory, psychosis, personality functioning, etc.		5			
APA Patient-Reported Outcome Measurement Information System (PROMIS) Level 2	More detailed assessment of current mental health symptoms, including anxiety, depression, anger, sleep disturbances, mania, obsessive-compulsive behaviors, and personality functioning		5			
DSM-5 Severity Scales - Acute Stress or Post-Traumatic Stress Disorder (PTSD)	Severity of acute stress and PTSD symptoms		5			
	Substance Use					
Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)	Lifetime and current substance use (last 3 months)		5			
	Biospecimens					
Saliva	Genome-wide association studies (GWAS), Epigenome- wide association studies (EWAS), transcriptomes	10	10*			
Stool	Metabolome, microbiome	15				
Urine	Metabolites and environmental exposures	5				
S	ocial and Environmental Determinants					
Adverse Childhood Experiences (ACEs)	Difficult or potentially traumatic events that occurred during childhood, such as abuse, violence, and exposure to caregivers with mental health conditions		2			
Composite Abuse Scale Revised - Short Form (CAS _R -SF)	Physical or emotional intimate partner violence in the past 12 months		4			
Demographics	Race, ethnicity, marital status, gender identity, sexual orientation, education, income, jobs during pregnancy and household composition*		20			
Patient-Reported Outcome Measurement Information System (PROMIS) Social Support / Perceived Stress	Availability of social support and perceptions of stress during the past 12 months		4			
Residential History for Geocoded Data Linkage	Home, work, or other frequented addresses for linking to external data sets		5			
	Transitions in Care					
Transitions in Care Screener	Survey to assess whether there were changes in child's main caregiver since the last visit		3			
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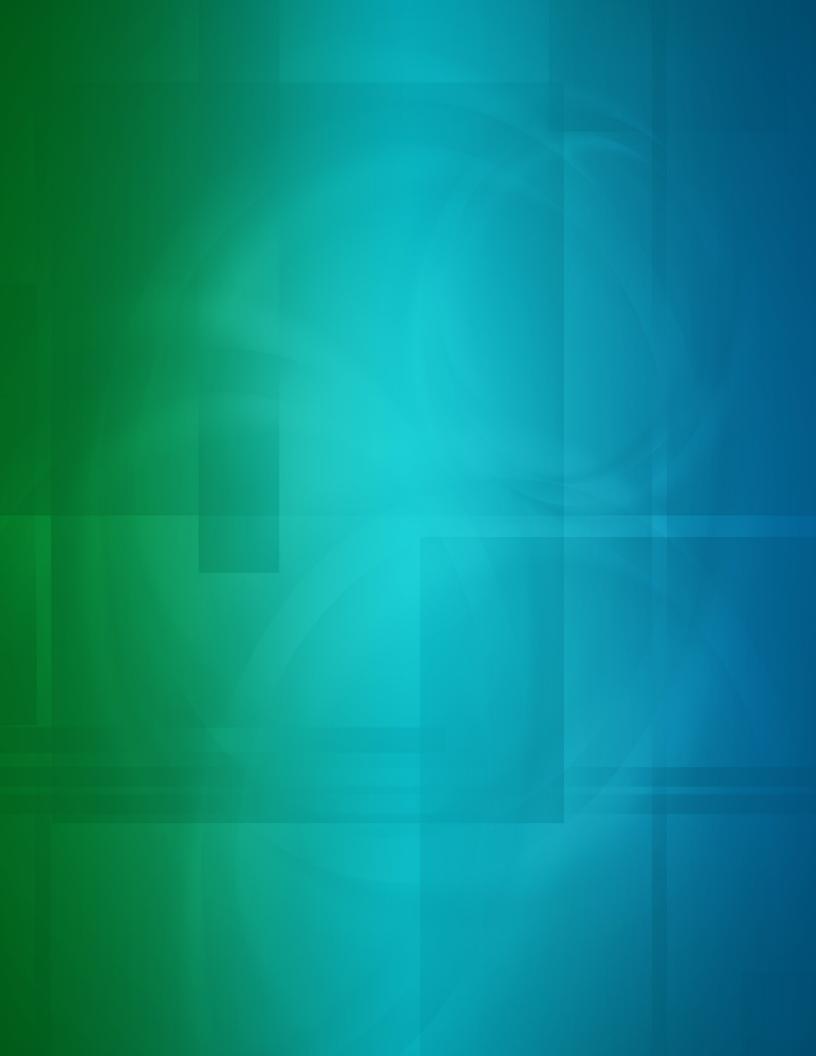
9-15 Months of Age

HBCD Measure	What it Measures	Child (min)	Adult (min)			
Physical Health						
Brief Infant Sleep Questionnaire Short Form (BISQ-SF)	Perceptions of infant sleep, infant sleep quality, bedtime routines and behaviors related to promoting sleep		5			
Head Circumference, Height, Weight	Child's physical growth	5				
Medical Record Extraction	Child's diagnoses, vaccinations, developmental screens, medications, hospitalizations, surgeries, laboratory results		10			
Pediatric Adverse Childhood Experiences and Related Life Events Screener (PEARLS)	Exposure to childhood adversity and other potential risk factors for stress, such as abuse, violence, and food or housing insecurity		2			
Vision Screener	Vision and common vision problems	1				
	Brain Imaging		•			
Outside the Scanner	Pre-Scan & Post-Scan Surveys: Sleep information, social behavior, transportation, scheduling, etc.		40			
	Diffusion MRI	13				
	Functional MRI (resting state)	16				
Magnetic Resonance Imaging (MRI)	MR Spectroscopy	10				
	Quantitative MRI	4				
	Structural MRI (T1/T2)	10				
	Brain Activity					
Outside of Electroencephalogram (EEG)	Pre-EEG and Post-EEG Measurements	30				
	Faces Task	4				
	Mismatch Negativity/Auditory Oddball Task	12				
Electroencephalogram (EEG)	Video Resting State	3				
	Visual Evoked Potential Task	1				
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9-15 Months of Age

HBCD Measure	What it Measures	Child (min)	Adult (min)			
Neurocognition and Language						
Bayley Scales of Infant and Toddler Development	Cognitive development, motor development, and communication	75				
MacArthur-Bates Communicative Development Inventory (CDI): Words and Gestures	Early language and communication skills		10			
Multilingual Language Development Survey	Assessment of child's exposure to different languages		3			
National Institutes of Health	Cognitive and Executive Function (gaze-based and touch-based tasks)	10				
(NIH) Baby Toolbox	Memory	10				
Be	Behavior and Caregiver-Child Interactions					
Confusion, Hubbub and Order Scale (CHAOS)	Features of the home environment, such as disorganization or environmental confusion		5			
Family Assessment Device General Functioning (FAD-GF-12)	Global health and functioning of the family unit, including communication, the emotional climate, and closeness among members of the family		3			
Home Observation for Measurement of the Environment in the 21st Century (HOME-21)	Parental responsiveness, discipline practices, exposure to stimulating materials, and enriching family interactions		7			
Laboratory Temperament Assessment Battery (Lab-TAB) Behavioral Inhibition Task	Inhibitory behaviors, such as social fear and distress, when the child is faced with a friendly but novel and unknown person	3				
Semi-Structured Play Task	Caregiver-child dynamics in a non-stressful environment with age-appropriate toys	5				
Total Visit Time (min)			95			

*Measure to be completed by the birthing parent only.





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