

# HBCD

PROTOCOL SUMMARY

VISIT 2: 0-1 MONTH



HEALthy Brain and Child Development  
*Babies · Brains · Bright Futures*

[HBCDStudy.org](http://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

**Recruitment Sites**

- Arkansas Children’s Hospital Research Institute
- Boston Children’s Hospital | Harvard Medical School
- 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 Minnesota
- University of New Mexico
- University of North Carolina Chapel Hill
- University of Vermont
- University of Wisconsin-Madison
- University of California, San Diego
- Vanderbilt University
- Virginia Tech
- Washington University

**HCAC**

- University of California San Diego
- Boston Children’s Hospital | Harvard Medical School

**HDCC**

- University of California San Diego
- University of Minnesota
- Washington University

# 0–1 Month of Age

| HBCD Measure   | What it Measures   | Child (min) | Adult (min) |
|--|--|-------------|-------------|
| <b>Adult Health</b>  |  |             |             |
| <b>American Psychiatric Association (APA) DSM-5 Level 1</b>  | Current mental health symptoms, including depression, anxiety, sleep problems, memory, psychosis, personality functioning, etc.  |             | 2.5         |
| <b>APA Patient-Reported Outcome Measurement Information System (PROMIS) Level 2</b>                      | More detailed assessment of current mental health symptoms, including anxiety, depression, anger, sleep disturbances, mania, obsessive-compulsive behaviors, and personality functioning |             | 2.5         |
| <b>DSM-5 Severity Scales - Acute Stress or Post-Traumatic Stress Disorder (PTSD)</b>                     | Severity of acute stress and PTSD symptoms   |             | 5           |
| <b>Edinburgh Postnatal Depression Scale (EPDS)</b>   | Symptoms of postnatal depression   |             | 3*          |
| <b>Health History</b>  | Most recent pregnancy health history, medication and other substance exposures, delivery and birth outcomes  |             | 30*         |
| <b>Substance Use</b>   |  |             |             |
| <b>Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)</b>                                | Lifetime and current substance use (end of pregnancy and since birth)  |             | 5*          |
| <b>Timeline Followback (TLFB)</b>  | Quantitative estimates of prenatal alcohol and substance use   |             | 20*         |
| <b>Biospecimens</b>  |  |             |             |
| <b>Saliva</b>  | Genome-wide association studies (GWAS), Epigenome-wide association studies (EWAS), transcriptomes  | 10          | 10*         |
| <b>Stool</b>   | Metabolome, microbiome   | 15          |             |
| <b>Urine</b>   | Metabolites and environmental exposures  | 5           |             |
| <b>Nails</b>   | Substance and environmental exposures  |             | 15*         |
| <b>Social and Environmental Determinants</b>   |  |             |             |
| <b>Patient-Reported Outcome Measurement Information System (PROMIS) Social Support/ Perceived Stress</b> | Availability of social support and perceptions of stress during the past month   |             | 4           |
| <b>Residential History for Geocoded Data Linkage</b>   | Home, work, or other frequented addresses for linking to external datasets   |             | 5           |
| <b>Transitions in Care</b>   |  |             |             |
| <b>Transitions in Care Screener</b>  | Survey to assess whether there were changes in child's main caregiver since the last visit   |             | 3           |

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\*Measure to be completed by the birthing parent only.

# 0–1 Month of Age

| HBCD Measure                              | What it Measures  | Child (min)            | Adult (min) |
|---|---|------------------------|-------------|
| <b>Physical Health</b>                    |   |                        |             |
| <b>2-Item Food Insecurity Screen</b>      | Household food insecurity   |                        | 1           |
| <b>Head Circumference, Height, Weight</b> | Child's physical growth   | 5                      |             |
| <b>Health History</b>                     | Child's medication and environmental exposures  |                        | 20          |
| <b>PhenX Breastfeeding Questionnaire</b>  | Whether the child was breastfed, breastfeeding duration, and introduction of solid foods                      |                        | 1           |
| <b>Novel Technology/Wearables</b>         |   |                        |             |
| <b>Activity Surveys</b>                   | Child activity levels and functioning of movement and heart rate sensors, assessed once daily for 72-96 hours |                        | 12          |
| <b>Heart Rate Sensors</b>                 | Child heart rate, SpO2, and respiratory rate using LED sensors  | 72 hours, worn at home | 5           |
| <b>Movement Sensors</b>                   | Child movement and sleep/wake cycles using sensors with an accelerometer and gyroscope                        | 72 hours, worn at home | 5           |
| <b>Brain Imaging</b>                      |   |                        |             |
| <b>Outside the Scanner</b>                | Pre-Scan & Post-Scan Surveys: Sleep information, social behavior, transportation, scheduling, etc.            |                        | 40          |
| <b>Magnetic Resonance Imaging (MRI)</b>   | Diffusion MRI   | 13                     |             |
|   | Functional MRI (resting state)  | 16                     |             |
|   | MR Spectroscopy   | 10                     |             |
|   | Quantitative MRI  | 4                      |             |
|   | Structural MRI (T1/T2)  | 10                     |             |
| <b>Total Visit Time (min)</b>             |   | <b>277</b>             |             |







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