

Diabetes Measures for PhenX Toolkit

	Measure	Brief Description of Recommended Protocols	
1	Autoimmune Diseases Related to Type 1 Diabetes	One question to ascertain whether a respondent (or his or her child) has autoimmune diseases related to type 1 diabetes.	
2	Diabetic Peripheral Neuropathy	Fifteen yes-or-no questions that assess feelings in the legs and feet.	
3	Diabetic Retinopathy	Three questions that capture history of diabetic eye disease and laser treatment for diabetic retinopathy.	
4	Family History of Diabetes	A questionnaire that captures incidence and age of diagnosis of diabetes and related conditions for a participant and among that participant's immediate family.	
5	Fasting C-peptide Assay for Residual Beta Cell Function	A protocol that describes procedures for drawing and processing blood and provides guidelines to aid comparability among different assays and studies.	
6	Fasting Plasma Glucose for Diabetes Screening	a. Blood Draw	This protocol describes procedures for drawing blood and processing the sample and provides guidelines to aid comparability among different studies. Glucose concentration is determined by the hexokinase method.
		b. Glucometer	This protocol describes measuring blood glucose concentrations using a glucose meter or glucometer.
7	Fasting Serum Insulin	A protocol that describes procedures for drawing and processing blood and provides guidelines to aid comparability among different assays and studies.	
8	Glycosylated Hemoglobin Assay that Reflects Long-Term Glucose Concentration	A protocol that describes procedures for drawing and processing blood and provides guidelines to aid comparability among different assays and studies. Researchers are referred to the National Glycohemoglobin Standardization Program for standardized assays.	
9	Medication Inventory	Participants are asked to bring in all current prescription and over-the-counter medications. The interviewer records the name of the medications, the strength, the amount prescribed, and the amount taken during the last 2 weeks.	
10	Oral Glucose Tolerance Test	Participants undergo an initial blood draw to determine fasting glucose levels. Participants then drink a dextrose solution and have a second blood draw 2 hours later. Glucose concentration is determined by the hexokinase method.	
11	Personal History of Kidney Failure	Three questions that capture history of kidney failure, renal dialysis, and kidney transplantation.	
12	Personal History of Type 1 and Type 2 Diabetes	Six questions to ascertain whether an individual has diabetes.	
13	Serum Creatinine Assay for Kidney Function	A protocol that describes procedures for drawing and processing blood and provides guidelines to aid comparability among different assays and studies. Creatinine concentration is determined by the Jaffe rate method.	
14	Urinary Creatinine Assay for Kidney Function	A protocol that describes procedures for collecting and processing urine and for determining creatinine concentration by the Jaffe rate method.	
15	Urinary Microalbumin Assay for Kidney Function	A protocol that describes procedures for collecting and processing urine and for determining albumin concentration by fluorescent immunoassay.	

NOTE: Complete protocols and links to common data elements are available through the PhenX Survey at <https://www.phenxtoolkit.org>.

What Is PhenX?

PhenX is a collaborative, consensus project between RTI International, the National Human Genome Research Institute (NHGRI) of the National Institutes of Health, and the larger research community. The objective of PhenX is to recommend measures with specified measurement protocols that have a high priority for inclusion in genome-wide association studies (GWAS). The consistent use of some measurement protocols across studies will facilitate cross-study comparisons. High-priority measures are, therefore, those measures that are broadly relevant to multiple health outcomes or assessments of health outcomes, although the measures are not focused on differential diagnosis.

Research Domains

The PhenX Steering Committee (SC) chose 21 research domains. A research domain is a field of research with a unifying theme and easily enumerated quantitative and qualitative measures. Working Groups (WGs) of experts in a specific domain were constituted, and they:

- Evaluated the scope of the domain and the broad elements of that scope, and then
- Recommended potential high-priority measures with specific measurement protocols.

These measures were vetted with the larger research community, and final recommendations from the WGs were reviewed by the SC. The primary goal of the project is to collect these recommendations in a Toolkit that will enable scientists to select measures and implement those measures in studies.

For more information on the PhenX project, please visit the project's website at <https://www.phenx.org/>.

Research Area (Domain)	Status	WG Chair(s)	SC Liaison
Alcohol, Tobacco and Other Substances	In Toolkit	Deborah S Hasin	Erin M Ramos
Anthropometrics	In Toolkit	Michele Forman	Michelle Williams
Cancer	In Toolkit	Neil Caporaso and Christine B Ambrosone	Margaret R Spitz
Cardiovascular	In Toolkit	Thomas A Pearson	William R Harlan
Demographics	In Toolkit	Myles Cockburn	Peter Kraft
Diabetes	In Toolkit	Craig L Hanis	William R Harlan
Environmental Exposures	In Toolkit	Lynn R Goldman	Diane Wagener
Gastrointestinal	In Toolkit	David Whitcomb	William R Harlan
Infectious Diseases and Immunity	In Toolkit	Richard Kaslow	Jonathan Haines
Neurology	In Toolkit	Jeffery M Vance	Lindsay A Farrer
Nutrition and Dietary Supplements	In Toolkit	Patrick J Stover	Jose M Ordovas
Ocular	In Toolkit	Janey L Wiggs	Jonathan Haines
Oral Health	In Toolkit	James Beck and Bryan Michalowicz	Mary L Marazita
Physical Activity and Physical Fitness	In Toolkit	Bill Haskell and Rick Troiano	Jose M Ordovas
Psychiatric	In Toolkit	Jordan Smoller and Kenneth Kendler	Carlos N Pato
Psychosocial	In Toolkit	Bernice Pescosolido	Carlos N Pato
Reproductive Health	In Toolkit	Carol Hogue	Michelle Williams
Respiratory	In Toolkit	Edwin K Silverman	Terri H Beaty
Skin, Bone, Muscle and Joint	In Toolkit	Douglas P Kiel	Lindsay A Farrer
Social Environments	In Toolkit	Barbara Entwisle	Peter Kraft
Speech and Hearing	In Toolkit	Cynthia Morton and Mabel Rice	Mary L Marazita