CHDWB Codebook

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The Center for Health Discovery and Well-Being (CHDWB)

NOTE: This is the External Version

The Emory/Georgia Tech Predictive Health Institute (PHI), through its Center for Health Discovery and Well Being (CHDWB), is a component of the Georgia Clinical & Translational Science Alliance, a collaborative effort of Emory University, Morehouse School of Medicine, Georgia Institute of Technology (Georgia Tech), and the University of Georgia. The Predictive Health Institute was established as part of the Emory University strategic plan in 2005 as an innovative approach to understanding and optimizing health that focuses on maintaining health rather than treating disease. The CHDWB was established as the clinical expression of Predictive Health, with the purpose of integrating PHI principles with scientific discovery, health focused research and education using a combination of established and cutting edge tools to identify and measure risks and deviations from health. The CHDWB serves as a practical test of the concept of health-focused care, as well as an academic resource and a clinical-translational laboratory with its innovative delivery model and longitudinal database and tissue repository.

Two core CHDWB goals have been to describe health in social, cultural and biological terms, and to use these tools to understand and predict deviations from health and overall health prognosis. A variety of metrics are used in this process, including a battery of questionnaires, assessments and laboratory tests that are either disease specific (e.g. cancer, neurodegenerative diseases, and atherosclerosis) or follow common pathways such as oxidative stress, inflammation, and immune status.

The CHDWB established a prospective longitudinal cohort of approximately 750 individuals who were enrolled as early as 2006 and have undergone annual assessments as participation permitted and excepting attrition. Participants from the Emory University pool of employees were randomly offered to join the CHDWB cohort. Those who agreed to participate and who provided informed consent were predominantly heathy individuals.

As the scientific arm of the Predictive Health Institute, two core CHDWB goals have been to describe health in social, cultural and biological terms, and to use these tools to understand and predict deviations from health and overall health prognosis. The CHDWB serves as a practical test of the concept of health-focused care, as well as an academic resource and a clinical-translational laboratory with its innovative delivery model and longitudinal database and tissue repository. A variety of metrics are used in this process, including a battery of questionnaires, assessments and laboratory tests that are either disease specific

(e.g. cancer, neurodegenerative diseases, and atherosclerosis) or follow common pathways such as oxidative stress, inflammation, and immune status. Examples of data elements collected from participants each year are personal and family health history, occupational history and exposures, tobacco and alcohol use, traditional medical and complementary medication use, detailed food intake, measures of stress, anxiety, depression, spirituality, validated metrics of physical functioning, social support, sleepiness and sleep quality. Participants also undergo traditional medical testing including treadmill testing, body composition and bone density testing, measures of cardiovascular function and risk, and traditional laboratory testing such as blood chemistry and hormone profiles. Innovative and cutting edge laboratory testing is also performed for regenerative cell potential, oxidative stress and inflammation, genetic and genomic analyses and large-scale metabolomics.

This Codebook

The rest of this "book" provides the documentation, codebook definitions, descriptions of each questionnaire, instrument, clinical measurement and lab results.

Personal Information (Demographics)

Overview

The Personal Information form collected information on each participant including:

- Age - computed from Date of Birth and visit date
- Home address including zip code
- Employment Information including employment status (part-time, full-time, etc) and affiliation (Emory, GaTech, etc)
- Birthweight, whether they were born premature and if so, by how many weeks
- If they were adopted
- Gender
- Race (up to 3 races were provided allowing for multirace)
- Ethnicity (Hispanic/Latino or not)
- Marital Status
- Children yes/no and if yes, how many
- Sexual Orientation
- Education as approximate years in school
- Income by ordinal category levels
- Birth City and State (and country)
- Military service information *(limited)*

Personal and Family Health History

Background

The Personal and Family Health History Form collected information on:

- Physical and Mental Health Assessment - list of any physical or mental conditions that may affect participant's ability to lie on their back, sit for long periods of time, walk on a treadmill or participate in physical activities.
- Activity restrictions
- Diet restrictions
- Pacemaker
- Childhood illnesses
- Mother - still living? age at time of death? cause of death?
- Father - still living? age at time of death? cause of death?
- Personal and Family Health History (parents, grandparents, siblings, children) for:
  - Anxiety or Depression
  - Emphysema
  - Asthma
  - Eye issues
  - CHEST Discomfort
  - Addictions
  - Alcoholism
  - Allergies (drugs, food, latex, seasonal)
  - Arthritis
  - Back problems (chronic pain, herniated discs, sciatica, scoliosis, whiplash)
  - Bladder, Kidney problems, anemia
  - Bleeding
  - Cancer
  - Chicken Pox
  - High Cholesterol
  - CMV (Cytomeglovirus)
  - Depression
  - Diabetes
  - Digestive problems
  - Diphteria
  - Ear problems (Ache, draining, hearing, itching)
  - Emphysema
  - Eye issues (eye bags, blur, Far sighted, Glaucoma, itching, lens problems, Near sighted, prescription glasses, reading glasses, redness)
  - Genetic conditions
  - Gout

- Head (headaches/migraines, dizziness, fainting, insomnia)
- Heart disease
- Hepatitis
- Hernia
- Herpes
- High Blood Pressure
- HIV
- Hormonal issues
- Immune problems
- Intestinal issues
- Kidney Disease, Infection
- Low Blood Pressure
- Lung issues (Asthma, Bronchitis, difficulty breathing, chest congestion, shortness of breath)
- Measles
- MONO
- Mouth issues (Canker sores, chronic coughing, Gagging, frequent need to clear throat, Sore throat, hoarseness, loss of voice, Swollen or discolored tongue, gums, lips, swallowing issues)
- Mumps
- Muscle issues (Feeling of weakness or tiredness, Pain or aches in joints, Pain or aches in muscles, Stiffness or limitation of movement,)
- Nervousness
- Neurological issues (Confusion, poor comprehension, Difficulty in making decisions, Learning disability, Poor concentration, Poor memory, Poor physical coordination, Slurred speech, Stuttering or stammering)
- Osteoporosis
- Overweight
- Pneumonia
- Polio
- Psychological disorders
- Reflux
- Respiratory issues
- Rheumatic fever
- Hemorrhoids
- Scarlett fever
- Seizures
- Sinus/Upper respiratory tract infection
- Skin issues (acne, Eczema, Flushing, hot flashes, Hair loss, Hives, rashes, dry skin, Psoriasis)
- Smallpox

- STD
- Stroke
- Suicidal/Suicide
- Thyroid issues (hyper, hypo)
- TMJ issues
- Tuberculosis
- Ulcer
- Venereal disease
- Weight loss
- Weight gain
- Whooping cough
- Other conditions and details

Medication, Supplement and Herb Use

Background

The Medication, Supplement and Herb Use Form collected information on any medications (over-the-counter and prescription), vitamins and mineral supplements, herbal remedies or other complementary or alternative supplements.

This data was collected using free text and was updated at every visit. To date, the data have not been sorted by drug/supplement class.

Health Symptoms

Background

The Health Symptoms Form asked the following 39 questions for symptoms assessment.

1. Headache
2. Feeling your heart pound or race
3. Back pain
4. Pain in arms, legs, or joints
5. Fainting spells
6. Stomach or abdominal pains
7. Dizzy spells
8. Tiredness or fatigue
9. Chest pain
10. Menstrual or menopausal problems
11. Nausea, gas or indigestion
12. Constipation, loose bowels or diarrhea

13. Sexual problems
14. Trouble sleeping
15. Trouble falling asleep
16. Awakening during sleep
17. Shortness of breath
18. Skin problems
19. Trouble urinating
20. Numbness in hands or feet
21. Problems swallowing
22. Sinus problems
23. In the past 1-2 year have you had your Blood Pressure taken?
24. In the past 1-2 years have you had your blood cholesterol (fat) checked?
25. In the past 1-2 years have you had your blood glucose (sugar) checked?
26. In the past year have you had an examination for blood in your stool performed?
27. If you are over 50 years old, have you had a colonoscopy performed (bowel scope exam)?
28. If you are a male, do you perform monthly testicular self-exams?
29. If you are a male over the age of 50 years old, have you had a blood test performed to check your prostate?
30. If you are a sexually active female and have a cervix, have you had a Pelvic/PAP Smear examination every 3 years?
31. If you are a female, do you perform monthly breast self-exams?
32. If you are a female over 40 years old, have you had a breast x-ray (mammogram) performed every 2 years?
33. Have you had a Rubella vaccine?
34. Have you had a Hepatitis B vaccine?
35. Have you had a Tetanus and Diphtheria vaccine (every 10 years)?
36. If you never had chickenpox, have you had a Varicella vaccine?
37. If you are over 50 years old, have you had a flu vaccine?
38. If you are over 65 years old, have you had a pneumonia vaccine?
39. From the following statements, please choose the most appropriate statement relating to your level of physical activity.

Perceived Stress Scale

Background

The Perceived Stress Scale (PSS) was used to determine how the participant "perceived" stress. The survey asks the following 14 questions about stressful situations and helps determine what stress is to the participant and how stressful they feel their life to be. Higher scores indicate higher levels of stress.

The 14 items are scored from 0 to 4. Total scores range from 0 to 56. Score categories are:

- Low Stress (scores 0 - 18)
- Moderate Stress (scores 19 - 37)
- High Stress (scores 38 - 56)

More information on the PSS (14 item version used here and others) by Dr. Sheldon Cohen is available at http://www.psy.cmu.edu/~scohen/scales.html.

PSS-14 Items

1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and stressed?
4. In the last month, how often have you dealt successfully with irritating life hassles?
5. In the last month, how often have you felt that you were effectively coping with important changes that were occurring in your life?
6. In the last month, how often have you felt confident about your ability to handle your personal problems?
7. In the last month, how often have you felt that things were going your way?
8. In the last month, how often have you found that you could not cope with all the things that you had to do?
9. In the last month, how often have you been able to control irritations in your life?
10. In the last month, how often have you felt that you were on top of things?
11. In the last month, how often have you been angered because of things that happened that were outside of your control?
12. In the last month, how often have you found yourself thinking about things that you have to accomplish?
13. In the last month, how often have you been able to control the way you spend your time?
14. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Complimentary and Alternative Therapy Use

Background

The Complimentary and Alternative Therapy Use form gathered information on whether in the last year:

- they saw any of the following:
  - ACUPUNCTURIST

- – CHIROPRACTOR
- – HOMEOPATH
- – MASSEUSE
- – MEDITATION
- – NATUROPATH
- they regularly practice any of the following:
  - – PRAYER
  - – TAICHI
  - – THERAPY_COMP
  - – THERAPY_PRACT
  - – XIGONG
  - – YOGA

Occupational History and Exposures

Background

The Occupational History and Exposures form captured the following information on each participant:

- Name of Employer
- Product or Service Provided
- Year Started
- Year Ended
- Job Title
- Job Duties
- Protective Equipment Used?
- Major Exposures
  - – Chemicals = c
  - – Metals = m
  - – Dusts = d
  - – Biologic = b
  - – Physical = ph
  - – Psychologic = ps

Tobacco and Alcohol Use

Background

The Tobacco and Alcohol Use form collected the following information:

- Alcohol Use Questions:

- Do you drink alcoholic beverages?
- Do you drink more than 2 alcoholic drinks a day?
- Do you now have or have you ever had problems with excessive alcohol use?
- If you drink more than an average of two alcoholic drinks each day, what are the major obstacles to your cutting down
- I seriously intend to decrease my alcohol consumption in the next 30 days
- I seriously intend to decrease my alcohol consumption in the next 6 months
- Tobacco Use
  - Did you smoke on a daily basis?
  - If yes, number of cigarettes and how often
  - If quit, for how long?
  - Have you EVER smoked tobacco?
  - If you smoke cigarettes now, how often?
  - If you smoke cigars now, how often?
  - What are the major obstacles to your quitting tobacco?
  - If you smoke a pipe now, how often?
  - I seriously intend to quit using tobacco in the next 30 days
  - I seriously intend to quit using tobacco in the next 6 months
  - Do you live with people who smoke?
  - If you use "smokeless tobacco" now, how often?

Absenteeism and Presenteeism Survey

Background

The Absenteeism and Presenteeism Survey asked the following items:

- About how many hours altogether did you work in the past 7 days? (If more than 97, enter 97.)
- How many hours does your employer expect you to work in a typical 7-day week? (If it varies, estimate the average. If more than 97, enter 97.)
- In the past 4 weeks (28 days), how many days did you miss an entire work day because of problems with your physical or mental health? (Please include only days missed for your own health, not someone else's health.)
- In the past 4 weeks (28 days), how many days did you miss an entire work day for any other reason (including vacation)?
- In the past 4 weeks (28 days), how many days did you miss part of a work day because of problems with your physical or mental health? (Please include only days missed for your own health, not someone else's health.)
- In the past 4 weeks (28 days), how many days did you miss part of a work day for any other reason (including vacation)?

- In the past 4 weeks (28 days), how many days did you come in early, go home late, or work on your day off?
- About how many hours altogether did you work in the past 4 weeks (28 days)? (See examples below.)
- On a scale from 0 to 10 where 0 is the worst job performance anyone could have at your job and 10 is the performance of a top worker, how would you rate the usual performance of most workers in a job similar to yours? (Use whole numbers only)
- Using the same 0-to-10 scale, how would you rate your usual job performance over the past year or two?
- Using the same 0-to-10 scale, how would you rate your overall job performance on the days you worked during the past 4 weeks (28 days)?

The dataset also includes computed values for:

- absolute_absenteeism_4_week
- relative_absenteeism_4_week
- relative_hours_of_work_4_week
- relative_total_score_4_week
- total_score_4_week
- absolute_absenteeism_7_day
- relative_absenteeism_7_day
- relative_hours_of_work_7_day
- relative_total_score_7_day
- total_score_7_day
- relative_presenteeism
- absolute_presenteeism

Oral Health Survey

Background

The Oral Health Survey asked the following questions about oral health:

- Gum disease is a common problem with the mouth. People with gum disease might have swollen gums, receding gums, sore or infected gums or loose teeth. Do you think you might have gum disease?
- Overall, how would you rate the health of your teeth and gums?
- Have you ever had treatment for gum disease such as scaling and root planning, sometimes called deep cleaning?
- Have you ever had any teeth become loose on their own, without an injury?
- Have you ever been told by a dental professional that you lost bone around your teeth?
- During the past three months, have you noticed a tooth that doesn't look right?

- Aside from brushing your teeth with a toothbrush, in the last seven days, how many days did you use dental floss or any other device to clean between your teeth?
- Aside from brushing your teeth with a toothbrush, in the last seven days, how many days did you use mouthwash or other dental rinse product that you use to treat dental disease or dental problems?

From the National Health and Nutrition Examination Survey (NHANES), Oral Health Survey, Version 08/31/2009 https://wwwn.cdc.gov/Nchs/Nhanes/2009-2010/OHQ_F.htm.

Early Trauma Inventory Self Report Survey

Background

The Early Trauma Inventory Self Report Survey asked the following questions:

1. Were you every exposed to a life-threatening natural disaster?
2. Were you involved in a serious accident?
3. Did you ever suffer a serious personal injury or illness?
4. Did you ever experience the death or serious illness of a parent or primary caretaker?
5. Did you experience the divorce or separation of your parents?
6. Did you experience the death or serious injury of a sibling?
7. Did you experience the death or serious injury of a friend?
8. Did you ever witness violence towards others, including family members?
9. Did anyone in your family ever suffer from mental health or psychiatric illness or have a "breakdown"?
10. Did your parent or primary caretaker have a problem with alcoholism or drug or drug abuse?
11. Did you ever see someone murdered?
12. Were you ever slapped in the face with an open hand?
13. Were you every burned with hot water, a cigarette or something else?
14. Were you ever punhed or kicked?
15. Were you ever hit with an object that was thrown at you?
16. Were you ever pushed or shoved?
17. Were you often put down or ridiculed?
18. Were you often ignored or made to feel that you didn't count?
19. Were you often told that you were no good?
20. Most of the time were you treated in a cold, uncaring way or made to feel like you were not loved?
21. Did your parents or caretakers often fail to understand you or your needs?
22. Were you ever touched in an intimate or private part of your body (e.g. breast, thighs, genitals) in a way that surprised you or made you feel uncomfortable?
23. Did you ever experience someone rubbing their genitals against you?

24. Were you ever forced or coerced to touch another person in an intimate or private part of their body?
25. Did anyone ever have genital sex with you against your will?
26. Were you ever forced or coerced to perform oral sex on someone against your will?
27. Were you ever forced to kiss someone in a sexual rather than affectionate way?
28. Did you ever experience emotions of intense fear, horror, or helplessness?
29. Did you ever feel out-of-your-body or as if you were in a dream?

More information on the Early Trauma Inventory Self Report Survey (ETISR-SF): http://onlinelibrary.wiley.com/doi/10.1002/1520-6394(2000)12:1%3C1::AID-DA1%3E3.0.CO;2-W/full

Beck Depression Index

Background

The Beck Depression Index (BDI) is a 21-item, self-report rating inventory that measures characteristic attitudes and symptoms of depression (BECK 1961). The BDI-II was a 1996 revision of the BDI (Beck et al. 1996) developed in response to the American Psychiatric Association's publication of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, which changed many of the diagnostic criteria for Major Depressive Disorder.

Items involving changes in body image, hypochondriasis, and difficulty working were replaced. Also, sleep loss and appetite loss items were revised to assess both increases and decreases in sleep and appetite. All but three of the items were reworded; only the items dealing with feelings of being punished, thoughts about suicide, and interest in sex remained the same. Finally, participants were asked to rate how they have been feeling for the past two weeks, as opposed to the past week as in the original BDI.

Like the BDI, the BDI-II also contains 21 questions, each answer being scored on a scale value of 0 to 3. Higher total scores indicate more severe depressive symptoms. The standardized cutoffs used differ from the original:

- 0–13: minimal depression
- 14–19: mild depression
- 20–28: moderate depression
- 29–63: severe depression.

It should be noted that several papers have been written on the underlying dimensions of the BDI on whether the instrument captures two underlying constructs (somatic and cognitive) or three (somatic, cognitive and affective) (Corbi'ere et al. 2011)

More information on the Beck Depression Index (BDI) can also be found at the website of the American Psychological Association.

BLOCK Food Frequency Survey

Background

The BLOCK Food Frequency Survey asked the following:

1. "Respondent ID (scanned RAW data)"
2. "Booklet Number (printed on paper FFQs)"
3. "Date completed (MMDDYYYY), 8 characters, RAW"
4. "Sex 1=M, 2=F, M=missing, E=Multiple mark"
5. "Pregnant? 1=N, 2=Y, 3=Not female"
6. "Age, years"
7. "Scanned Weight (lbs.), 3 characters"
8. "Height, feet"
9. "Height, inches"
10. "Body Mass Index"
11. 'Food energy,kcals'
12. 'Protein, gms'
13. 'Fat, gms'
14. 'Carbohydrate, gms'
15. 'Calcium, mg'
16. 'Phosphorus, mg'
17. 'Iron, mg'
18. 'Sodium, mg'
19. 'Potassium, mg'
20. 'Glutathione, total, mg'
21. 'Glutathione, reduced, mg'
22. 'Thiamin (Vitamin B1), mg'
23. 'Riboflavin (Vitamin B2), mg'
24. 'Niacin , mg'
25. 'Vitamin C, mg'
26. 'Saturated fat, gms'
27. 'Monounsaturated fatty acids, gms'
28. 'Polyunsaturated fatty acids, gms'
29. 'Cholesterol, mg'
30. 'Dietary fiber, gms'
31. "Dietary soluble fiber, gms"
32. 'Food folate, mcg'
33. 'Vitamin E as alpha-tocopherol, mg'
34. 'Zinc, total, mg'
35. 'Zinc, animal sources only, mg'

36. 'Vitamin B6, mg'
37. 'Magnesium, mg'
38. 'Vitamin A (mcg), RAE'
39. 'Retinol, mcg'
40. 'Alpha-carotene, mcg'
41. 'Beta-carotene, mcg'
42. 'Cryptoxanthin, beta, mcg'
43. 'Lutein-Zeaxanthin, mcg'
44. 'Lycopene, mcg'
45. 'Folic acid, mcg'
46. 'Vitamin B-12, mcg'
47. 'Vitamin D, IU'
48. 'Vitamin K as phylloquinone, mcg'
49. 'Copper, mg'
50. 'Selenium, mcg'
51. 'Sugars, total, gms'
52. 'Trans fats, total, gms'
53. 'Isoflavones, total, mg'
54. 'Quercetin, mg'
55. 'Cysteine (S-containing), mg'
56. 'Methionine (S-containing), mg'
57. 'Cystine (S-containing), mg'
58. 'Average daily Dietary Folate Equivalents, mcg'
59. 'Glycemic Index (glucose), average daily'
60. 'Glycemic Load (glucose), average daily'
61. "Dietary arginine, mg"
62. "Dietary PUFA (~N-6) 18:2, gms"
63. "Dietary PUFA (~N-3) 18:3, gms"
64. "Dietary PUFA (~N-3) 18:4, gms"
65. "Dietary PUFA (~N-6) 20:4, gms"
66. "Dietary N-3 PUFA 20:5 (EPA), gms"
67. "Dietary N-3 PUFA 22:5 (DPA), gms"
68. "Dietary N-3 PUFA 22:6 (DHA), gms"
69. "Avg. daily omega-6 FA, gms""
70. "Avg. daily omega-3 FA, gms""
71. 'Fructose, gms'
72. 'Lactose, gms'
73. 'Maltose, gms'
74. 'Galactose, gms'
75. 'Sucrose, gms'

76. 'Glucose, gms'
77. "Total choline, mg"
78. "Free choline, mg"
79. "Phosphocholine, mg"
80. "Glycerophosphocholine (GPC), mg"
81. "Phosphatidylcholine (PTD), mg"
82. "Betaine, mg"
83. "Sphingomyelin (SM), mg"
84. "# of solid foods respondent reported ever eating"
85. "Average total daily frequency of all solid foods"
86. 'Grams of solid food, average daily'
87. '% of kcal from fat'
88. '% of kcal from protein'
89. '% of kcal from carbohydrate'
90. '% of kcal from sweets, desserts'
91. '% of kcal from alcoholic beverages'
92. '% fat kcals, alcoholic beverages not in denominator'
93. '% protein kcals, alc. beverages not in denominator'
94. '% carbohydrate kcals, alc. beverages not in denom.'
95. 'Dietary fiber from beans, gms'
96. 'Dietary fiber from vegetables, fruits, gms'
97. 'Dietary fiber from grains, gms'
98. 'Avg. daily intake of sugary beverages, gms'
99. 'Kilocalories per day from sugary beverages'
100. 'Daily servings of vegetables'
101. 'Daily frequency of fruits & fruit juices'
102. 'Daily svgs breads, cereals, rice, pasta'
103. 'Daily svgs meat, fish, poultry, beans, eggs'
104. 'Daily servings of milk, yogurt, cheese'
105. 'Daily svgs fats & oils, sweets, sodas'
106. 'Average daily servings of whole grains'
107. 'Vit A from supplements, IU'
108. 'Vit C from supplements, mg'
109. 'Vit D from supplements, IU'
110. 'Vit E from supplements, a-TE'
111. 'Iron from supplements, mg'
112. 'Calcium from supplements, mg'
113. 'Zinc from supplements, mg'
114. 'Beta-carotene from supplements, mcg'
115. 'B-1 (Thiamin) from supplements, mg'

116. 'B-6 from supplements, mg'
117. 'B-12 from supplements, mcg'
118. 'Folic acid from supplements, mcg'
119. 'Copper from supplements, mg'
120. 'Selenium from supplements, mcg'
121. 'Riboflavin from supplements, mg'
122. 'Magnesium from supplements, mg'
123. 'Niacin from supplements, mg'
124. 'Omega-3 fatty acids from supplements, gms'
125. 'Omega-6 fatty acids from supplements, gms'
126. '"Added sugars, teaspoon equivalents"
127. "Alcohol drink-equiv. (about 13 g EtOH)"
128. '"Discretionary fat, oil, grams"
129. '"Discretionary fat, solid, grams"
130. '"Cheese, milk-equivalent servings"
131. '"Milk, cups"
132. '"Total dairy, milk-equivalent servings"
133. '"Yogurt, cups"
134. '"Citrus melon berries, cups"
135. '"Other fruit, cups"
136. '"Total fruit, cups"
137. '"Solid fruit (not juice), cups"
138. "Juices (including in fruit sodas), cups"
139. "Juices (only 100% juice), cups"
140. '"Non-whole grains, ounce-equivalents"
141. '"Total grains, ounce-equivalents"
142. '"Whole grains, ounce-equivalents"
143. '"Dry beans peas, cups"
144. '"Eggs, lean meat ounce-equivalents"
145. "Fish seafood, high in omega-3, ounces"
146. "Fish seafood, low in omega-3, ounces"
147. '"Lunch meats, ounces"
148. '"Beef pork lamb, ounces"
149. '"Meat fish poultry, ounces"
150. '"Nuts seeds, lean meat ounce-equivalents"
151. '"Organ meats, ounces"
152. '"Poultry, ounces"
153. '"Soy foods, cups"
154. '"Vegetables deep yellow orange, cups"
155. '"Vegetables dark green leafy, cups"

156. '"Vegetables other, cups"
157. '"Vegetables potatoes, cups"
158. '"Vegetables starchy, cups"
159. '"Vegetables tomatoes, cups"
160. '"Total vegetables, cups"
161. "My Pyramid Fruit - total, incl juice (cups)"
162. "My Pyramid Veg - not legumes/potatoes (cups)"
163. "My Pyramid Veg - dark green (cups)"
164. "My Pyramid Veg - orange (cups)"
165. "My Pyramid Legumes, soy (cup equiv)"
166. "My Pyramid Veg - potato (cups)"
167. "My Pyramid Veg - other, incl tomatoes (cups)"
168. "My Pyramid Grain - total (1-oz. equivalents)"
169. "My Pyramid Grain - whole (1-oz. equiv.)"
170. "My Pyramid Meat - fish, chix, meat (1 oz.)"
171. "My Pyramid Nuts, seeds - (1-oz. meat equiv.)"
172. "My Pyramid Eggs - meat equiv (1 egg = 1 oz.)"
173. "My Pyramid Dairy - milk, cheese (1 cup equiv.)"
174. "Beneficial Oils - dressings, fish, nuts, avocado (1 tsp)"
175. "Breakfast egg sandwich, frequency"
176. "Breakfast egg sandwich, quantity"
177. "Other eggs, frequency"
178. "Other eggs, quantity"
179. "Breakfast sausage, frequency"
180. "Breakfast sausage, quantity"
181. "Bacon, frequency"
182. "Bacon, quantity"
183. "Pancakes, frequency"
184. "Pancakes, quantity"
185. "Cooked Cereal, frequency"
186. "Cooked Cereal, quantity"
187. "Cold cereal, frequency"
188. "Cold cereal, quantity"
189. "MILK ON CEREAL - SCANNED FREQUENCY"
190. "Yogurt, frequency"
191. "Yogurt, quantity"
192. "Cheese, frequency"
193. "Cheese, quantity"
194. "Bananas, freq"
195. "Bananas, quantity"

196. "Apples, freq"
197. "Apples, quantity"
198. "Oranges, freq"
199. "Oranges, quantity"
200. "Grapefruit, freq"
201. "Grapefruit, quantity"
202. "Peaches, raw, freq"
203. "Peaches, raw, quantity"
204. "Other fresh fruit, freq"
205. "Other fresh fruit, quantity"
206. "Canned fruit, freq"
207. "Canned fruit, quantity"
208. "Cantaloupe, in season, freq"
209. "Cantaloupe, in season, quantity"
210. "Strawberries, in season, freq"
211. "Strawberries, in season, quantity"
212. "Watermelon, in season, freq"
213. "Watermelon, in season, quantity"
214. "Broccoli, freq"
215. "Broccoli, quantity"
216. "Carrots, freq"
217. "Carrots, quantity"
218. "Corn, freq"
219. "Corn, quantity"
220. "Green beans, freq"
221. "Green beans, quantity"
222. "Spinach, freq"
223. "Spinach, quantity"
224. "Greens, freq"
225. "Greens, quantity"
226. "Sweet potato, freq"
227. "Sweet potato, quantity"
228. "French Fries, freq"
229. "French Fries, quantity"
230. "Other potatoes, freq"
231. "Other potatoes, quantity"
232. "Cole slaw, freq"
233. "Cole slaw, quantity"
234. "Green salad, freq"
235. "Green salad, quantity"

236. "Tomatoes, freq"
237. "Tomatoes, quantity"
238. "Salad dressing, freq"
239. "Salad dressing, quantity"
240. "Other vegetables, freq"
241. "Other vegetables, quantity"
242. "Refried beans, freq"
243. "Refried beans, quantity"
244. "Other beans, freq"
245. "Other beans, quantity"
246. "Vegetable stew, freq"
247. "Vegetable stew, quantity"
248. "Vegetable soup, freq"
249. "Vegetable soup, quantity"
250. "Bean soup, freq"
251. "Bean soup, quantity"
252. "Other soup, freq"
253. "Other soup, quantity"
254. "Pizza, freq"
255. "Pizza, quantity"
256. "Spaghetti with meat sauce, freq"
257. "Spaghetti with meat sauce, quantity"
258. "Mac N Cheese, freq"
259. "Mac N Cheese, quantity"
260. "Other noodles, freq"
261. "Other noodles, quantity"
262. "Tofu, freq"
263. "Tofu, quantity"
264. "Meat substitutes, freq"
265. "Meat substitutes, quantity"
266. "Ever eat meat (1=Yes, 2=No)"
267. "Hamburger (cheeseburger), freq"
268. "Hamburger (cheeseburger), quantity"
269. "Hot dogs, freq"
270. "Hot dogs, quantity"
271. "Lunch Meats, freq"
272. "Lunch Meats, quantity"
273. "Meat loaf, freq"
274. "Meat loaf, quantity"
275. "Beef, freq"

276. "Beef, quantity"
277. "Tacos, freq"
278. "Tacos, quantity"
279. "Ribs, freq"
280. "Ribs, quantity"
281. "Pork, freq"
282. "Pork, quantity"
283. "Veal, lamb, frequency"
284. "Veal, lamb, quantity"
285. "Liver, freq"
286. "Liver, quantity"
287. "Pigs feet, variety meats, freq"
288. "Pigs feet, variety meats,quantity"
289. "Menudo, freq"
290. "Menudo, quantity"
291. "Other beef dish, freq"
292. "Other beef dish, quantity"
293. "Fried chicken, freq"
294. "Fried chicken, quantity"
295. "Roast chicken, freq"
296. "Roast chicken, quantity"
297. "Other chicken dishes, freq"
298. "Other chicken dishes, quantity"
299. "Oysters, freq"
300. "Oysters, quantity"
301. "Shellfish, freq"
302. "Shellfish, quantity"
303. "Tuna, freq"
304. "Tuna, quantity"
305. "Fried fish, freq"
306. "Fried fish, quantity"
307. "Other fish, freq"
308. "Other fish, quantity"
309. "Biscuits, freq"
310. "Biscuits, quantity"
311. "Burger rolls, freq"
312. "Burger rolls, quantity"
313. "Bagels, English muffins, freq"
314. "Bagels, English muffins, quantity"
315. "Tortillas (flour), freq"

316. "Flour tortillas, quantity"
317. "Corn bread, freq"
318. "Corn bread, quantity"
319. "White bread, freq"
320. "White bread, quantity"
321. "Rice, freq"
322. "Rice, quantity"
323. "Margarine, freq"
324. "Margarine, quantity"
325. "Butter, freq"
326. "Butter, quantity"
327. "Power bars, freq"
328. "Power bars, quantity"
329. "Breakfast bars, freq"
330. "Breakfast bars, quantity"
331. "Nuts, freq"
332. "Nuts, quantity"
333. "Peanut butter, freq"
334. "Peanut butter, quantity"
335. "Chips, freq"
336. "Chips, quantity"
337. "Crackers, freq"
338. "Crackers, quantity"
339. "Jelly, freq"
340. "Jelly, quantity"
341. "Mayonnaise, freq"
342. "Mayonnaise, quantity"
343. "Catsup, freq"
344. "Catsup, quantity"
345. "Mustard, freq"
346. "Mustard, quantity"
347. "Donuts, freq"
348. "Donuts, quantity"
349. "Cake, freq"
350. "Cake, quantity"
351. "Cookies, freq"
352. "Cookies, quantity"
353. "Ice cream, freq"
354. "Ice cream, quantity"
355. "Chocolate syrup, freq"

356. "Chocolate syrup, quantity"
357. "Pumpkin Pie, freq"
358. "Pumpkin Pie, quantity"
359. "Other pie, freq"
360. "Other pie, quantity"
361. "Chocolate candy, freq"
362. "Chocolate candy, quantity"
363. "Other candy, freq"
364. "Other candy, quantity"
365. "Milk (default 2%), freq"
366. "Milk (default 2%), quantity"
367. "Slimfast, freq"
368. "Slimfast, quantity"
369. "Tomato juice, freq"
370. "Tomato juice, quantity"
371. "Real orange juice, freq"
372. "Real orange juice, quantity"
373. "Other real juice, freq"
374. "Other real juice, quantity"
375. "Hi C, freq"
376. "Hi C, quantity"
377. "Drinks with some juice, freq"
378. "Drinks with some juice, quantity"
379. "Ice tea, freq"
380. "Ice tea, quantity"
381. "Kool aid, freq"
382. "Kool aid, quantity"
383. "Sodas, freq"
384. "Sodas, quantity"
385. "Beer, freq"
386. "Beer, quantity"
387. "Wine, freq"
388. "Wine, quantity"
389. "Liquor, freq"
390. "Liquor, quantity"
391. "Water, freq"
392. "Water, quantity"
393. "Coffee, freq"
394. "Coffee, quantity"
395. "Hot tea, freq"

396. "Hot tea, quantity"
397. "Cream/milk in coffee"
398. "Cream/milk in tea"
399. "Sugar in coffee: 1=No, 2=Yes"
400. "Teaspoons: sugar in coffee"
401. "Sugar in tea: 1=No, 2=Yes"
402. "Teaspoons: sugar in tea"
403. "How many vegetables eaten per day/week"
404. "How many fruits eaten per day or week"
405. "How often use fat/oil in cooking"
406. "What type of milk"
407. "Type of Slim Fast: low-carb, regular"
408. "Type of OJ: with Calcium or regular"
409. "Type of Soda: diet/low-cal, regular"
410. "Type of tea: home, bottled, sugar, not"
411. "Beer: reg., lite, low-carb, no-alc"
412. "Type Hamburger: just beef, w cheese"
413. "HotDogs: low-fat/turkey, regular"
414. "Type LunchMeat: low-fat/turkey, reg."
415. "Type Spaghetti: meatless, meat/balls"
416. "Type of Cheese: low-fat, regular"
417. "Salad Dressg: low-carb, low-fat, reg."
418. "EnergyBars: low-carb, low-fat, regular"
419. "BreakfastBars: low-carb, low-fat, reg."
420. "Bread: 100% whole grain, low-carb, reg."
421. "Type of Tortillas: corn, flour"
422. "ChocolateCandy: low-car, low-fat, reg."
423. "Cookies: low-carb, low-fat, reg."
424. "Cake: low-carb, low-fat, regular"
425. "Ice Cream: low-carb, low-fat, regular"
426. "Jelly: low-carb/low sugar, regular"
427. "How often eat fat on meat"
428. "How often eat skin on chicken"
429. "Cooking Fat - PAM OR NO OIL"
430. "Cooking Fat - Butter"
431. "Cooking Fat - Butter/marg. blend"
432. "Cooking Fat - Stick margarine."
433. "Cooking Fat - Soft tub margarine"
434. "Cooking Fat - Lowfat margarine"
435. "Cooking Fat - Corn oil"

436. "Cooking Fat - Olive oil"
437. "Cooking Fat - Lard"
438. "Cooking Fat - Crisco"
439. "Cold cereal type: Low-carb (165)"
440. "Cold cereal type: Cheerios (166)"
441. "Cold cereal type: Total (167)"
442. "Cold cereal type: Fiber (168)"
443. "Cold cereal type: Product 19 (169)"
444. "Cold cereal type: Bran (170)"
445. "Cold cereal type: Other fiber (171)"
446. "Cold cereal type: Sweetened (172)"
447. "Cold cereal type: Other (007)"
448. "How often Prenatal vitamins type"
449. "Number of Years: Prenatal vitamins"
450. "How often One-A-Day type w minerals"
451. "Number of Years: One-A-Day w minerals"
452. "How often Stress-Tabs, B-complex type"
453. "Number of Years: Stress-Tabs/B-complex"
454. "How often Vitamin A"
455. "Number of Years of Vitamin A type"
456. "How often Beta-Carotene"
457. "Number of Years: Beta-Carotene type"
458. "How often Vitamin C"
459. "Number of Years: Vitamin C type"
460. "How often Vitamin E"
461. "Number of Years: Vitamin E type"
462. "How often Folate"
463. "Number of Years: Folate type"
464. "How often Calcium/Dolomite"
465. "Number of Years: Calcium/Dolomite"
466. "How often Vitamin D, alone, w Calcium"
467. "Number of Years: Vitamin D"
468. "How often Zinc"
469. "Number of Years: Zinc type"
470. "How often Iron"
471. "Number of Years: Iron type"
472. "How often Selenium"
473. "Number of Years: Selenium type"
474. "How often Omega-3, fish/flax seed oil"
475. "Number Years: Omega-3, fish/flax oil"

476. "Minerals Y/N: 1=With, 2=W/O, M=DK"
477. "How many Mg per Vitamin C tablet"
478. "How many IU per Vitamin E capsule"
479. "Ginkgo"
480. "Ginseng"
481. "St. John's Wort"
482. "Kava Kava"
483. "Echinacea"
484. "Melatonin"
485. "DHEA"
486. "Glucosamine/Chondroitin"
487. "Didn't take these supps"
488. "Would you say your health is…"
489. "Currently trying to lose weight?"
490. "Ever drink more than currently?"
491. "Smoke cigarettes now?"
492. "If so, how many cigarettes?"
493. "Are you Hispanic or Latino?"
494. "Are you White?"
495. "Are you African American/Black?"
496. "Are you Asian?"
497. "Are you American Indian or Alaskan Native?"
498. "Are you Native Hawaiian or Pacific Islander?"
499. "Do not want to provide Race/Ethnicity info"

CAPS Typical Week Physical Activity Survey

Background

The Cross-Cultural Activity Participation Study (CAPS) Typical Week Physical Activity Survey is designed to identify the time and frequency spent in various activities during a typical week. The participants answers were used to determine is their current activity levels met the American College of Sports Medicine (ACSM)/American Heart Association (AHA) Physical Activity and Public Health Guidelines. The information was used to help the participants improve their activity levels for optimal health.

CAPS Survey - 30 items

1. Light Effort: Cooking, cleaning up, laundry, shopping, dusting
2. Moderate or Vigorous Effort: Scrubbing, vacuuming, repairs, mopping, washing car
3. Moderate Effort: Weeding, sweeping, mowing, raking
4. Vigorous Effort: Shoveling, pruning, chopping wood

5. Light Effort: Bathing, feeding, playing with child or animal
6. Moderate Effort: Lifting and carrying, pushing wheelchair or stroller
7. Light Effort: Drive or ride in a car, ride the bus or subway include travel to work
8. Moderate Effort: Walking to get places, to the bus, car, or work
9. Moderate Effort: Walking for exercise or social, walking your dog, during work breaks
10. Moderate Effort: Dancing in church, ceremonies, or for pleasure
11. Moderate or Vigorous Effort: Sports-golf, soccer, softball, tennis, racquetball, basketball
12. Moderate Effort: Low impact aerobics, health club machines, bicycling, Tai Chi
13. Vigorous Effort: Step aerobics, running/jogging, karate, swim training
14. Light Effort: Stretching and flexibility exercises
15. Moderate effort: Lifting weights, strength training
16. Light Effort: Watching TV and doing nothing else
17. Light Effort: Reading, sewing, or using a computer (not at work)
18. Do you work to earn money?
19. How many hours/week do you work to earn money in all jobs?
20. How many days/week in all jobs?
21. Light Effort: Sitting (e.g., office/lab work)
22. Light Effort: Standing (e.g., copy making, assembly, clerking)
23. Moderate Effort: Standing or walking (nursing, custodial, making deliveries)
24. Vigorous effort: Manual labor, ranch or farm labor, loading trucks
25. Do you work as a volunteer in activities you have not mentioned in the survey?
26. Light Effort: Sitting or standing
27. Moderate Effort: Standing or walking
28. Vigorous Effort: Pushing, lifting, carrying, climbing
29. Light Effort: How many hours do you sleep per night during the week (Monday-Friday)?
30. Light Effort: How many hours do you sleep per night during the weekend (Saturday - Sunday)?

From the items above based on daily/weekly time and frequencies, the following composite scores were computed:

- DAYLIVING_TOTAL - **NEED TO CHECK UNITS Met-minute/day or kcal/week??**
- MODERATE_GUIDELINE - was guideline met?
- MODERATE_GUIDELINE_DAYS - # days/week guideline was met
- MODERATE_TOTAL - **NEED TO CHECK UNITS Met-minute/day or kcal/week??**
- STRENGTH_GUIDELINE - was guideline met?
- STRENGTH_GUIDELINE_DAYS - # days/week guideline was met
- VIGOROUS_GUIDELINE - was guideline met?
- VIGOROUS_GUIDELINE_DAYS - # days/week guideline was met
- VIGOROUS_TOTAL - **NEED TO CHECK UNITS Met-minute/day or kcal/week??**

NOTE: The participants were told that it is recommended that healthy adults over the age of 18 perform moderately intense cardiovascular exercise for 30 minutes a day, five days a week or vigorously intense cardiovascular exercise for 20 minutes per day, three days a week and perform strength training exercises twice a week. Examples were provided as follows. Activities of daily living include routine activities which are of light intensity (self care, child care, casual walking, grocery shopping) or more intense activities that are less than 10 minutes in duration (walking to the parking lot, taking out the trash, etc). It is recommended to maintain or increase activities of daily living while minimizing sedentary lifestyle behaviors.

For more information, refer to the publication: "Moderate Physical Activity Patterns of Minority Women: The Cross-Cultural Activity Participation Study"; by Barbara E. Ainsworth, Melinda L. Irwin, Cheryl L. Addy, Melicia C. Whitt, and Lisa M. Stolarczyk. Journal of Women's Health & Gender-Based Medicine. July 2004, 8(6): 805-813. https://doi.org/10.1089/152460999319129.

SF36 Quality of Life Survey

Background

The SF36 Quality of Life Survey measures 8 general aspects of physical and mental health:

- vitality
- social functioning
- role-emotional
- mental health
- physical functioning
- role-physical
- bodily pain
- general health

and 2 composite scores for:

- physical component score
- mental component score

For each, the population normed scores are compiled. For each, the population norms have an average of 50. So, scores > 50 are above the population norm and scores < 50 are below.

More information on the SF36 Quality of Life survey can also be found at https://www.rand.org/health/surveys_tools/mos/36-item-short-form.html.

Memory and Cognition Survey

Background

The NexAde Memory and Cognition Survey provides indications of brain function and cognition. The test assesses the participant's brain functions including attention, memory, visuospatial learning and executive function. The results are then compared to other individuals in their age range who have also taken the test. The higher the score, the better brain function in that area.

The following data elements are available:

- Executive functions
- Mental flexibility
- Digit Symbol Substitution
- Visuospatial learning
- Spatial short term memory
- Focused attention
- Digits Recall Forward (memory span)
- Pattern Recall
- Symbol Spotting
- Pattern Identification
- Sustained attention
- Digits Recall Backward (memory span)
- Memory recognition
- Memory recall
- Delayed Pattern Recall

Family Assessment Device

Background

The Family Assessment Device (FAD) Survey asked the participant about their family during the past two months. Their scores show how well their family communicated and lived together as a unit. A low score indicates better family functioning - higher is worse family functioning indicating higher stress levels in the family.

Available online at
http://www.nctsnet.org/sites/default/files/assets/pdfs/family_assessment_device.pdf

The FAD is based on the McMaster Model of Family Functioning. The original scale has 60 items and measures 6 scales that assess the 6 dimensions of the MMFF - affective involvement, affective responsiveness, behavioral control, communication, problem

solving, and roles - as well as a 7th scale measuring general family functioning. However, the version used here consisted of 27-items focusing on 3 scales:

- Problem Solving
- Communication
- General Family Functioning

Each item is scored 1-4. Some items are reversed prior to summary. Final scores for each scale are the average across the items in their scale such that the final scores also range from 1-4.

Clinical Cutoffs are:

- General family functioning: scores > 2.00 are considered to indicate poor family functioning
- Communication and Problem Solving: scores > 2.20 are considered to indicate poor communication or problem solving skills respectively.

Additional information can be found at: (Akister and Stevenson-Hinde 1991) and (Bihum et al. 2002) and (Epstein, Baldwin, and Bishop 1983) and (Miller et al. 1985).

Items included

The following 27 items were included for the FAD version used in this study:

1. Planning family activities is difficult because we misunderstand each other.
2. We resolve most everyday problems around the house.
3. When someone is upset the others know why.
4. In times of crisis we can turn to each other for support.
5. We cannot talk to each other about the sadness we feel.
6. We usually act on our decisions regarding problems.
7. You can't tell how a person is feeling from what they are saying.
8. Individuals are accepted for what they are.
9. People come right out and say things instead of hinting of them.
10. We avoid discussing our fears and concerns.
11. It is difficult to talk to each other about tender feelings.
12. After our family tries to solve a problem, we usually discuss whether it worked or not.
13. We can express feelings to each other.
14. We talk to people directly rather than through go-betweens.
15. There are lots of bad feelings in the family.
16. We often don't say what we mean.
17. We feel accepted for what we are.
18. We resolve most emotional upsets that come up.
19. Making decisions is a problem for our family.
20. We are frank with each other.

21. We are able to make decisions about how to solve problems.
22. We confront problems involving feelings.
23. We don't get along well together.
24. We don't talk to each other when we are angry.
25. We confide in each other.
26. When we don't like what someone has done, we tell them.
27. We try to think of different ways to solve problems.

ENRICHD Social Support Instrument (ESSI)

Background

The ENRICHD Social Support Instrument (ESSI) was used to measure the participant's range of social support in their life. Higher scores indicated higher levels of social support.

The ESSI consists of 7 items. The first 6 used a 5-point LiKert scale numbered 1 to 5. The 7th item is a yes/no question, scored 4 for yes and 2 for no. Total scores range from 8 to 34. More information is available from: (Mitchell et al. 2003)

Items included

The 7 items are:

1. Is there someone available to you whom you can count on to listen to you when you need to talk?
2. Is there someone available to you to give you good advice about a problem?
3. Is there someone available to you who shows you love and affection?
4. Is there someone available to help you with daily chores?
5. Can you count on anyone to provide you with emotional support (talking over problems or helping you make a difficult decision)?
6. Do you have as much contact as you would like with someone you feel close to, someone in whom you can trust and confide?
7. Are you currently married or living with a partner?

The Epworth General Sleep Survey

Background

The Epworth Sleepiness Scale (ESS) is a scale intended to measure daytime sleepiness that is measured by use of a very short questionnaire. This can be helpful in diagnosing sleep disorders. It was introduced in 1991 by Dr Murray Johns of Epworth Hospital in Melbourne, Australia (Johns MW (1991)).

More information from the Epworth Sleepiness Scale website.

Dr Johns first developed the ESS for adults in 1990 and subsequently modified it slightly in 1997. He developed it so he could assess the 'daytime sleepiness' of the patients in his own private practice of Sleep Medicine. He named the questionnaire after Epworth Hospital in Melbourne, where he established the Epworth Sleep Centre in 1988.

The ESS is a self-administered questionnaire with 8 questions. Respondents are asked to rate, on a 4-point scale (0-3), their usual chances of dozing off or falling asleep while engaged in eight different activities. Most people engage in those activities at least occasionally, although not necessarily every day. The ESS score (the sum of 8 item scores, 0-3) can range from 0 to 24. The higher the ESS score, the higher that person's average sleep propensity in daily life (ASP), or their 'daytime sleepiness'. The questionnaire takes no more than 2 or 3 minutes to answer. It is available in many different languages.

The 1997 version of the ESS is the standard version that can be used by most adults. A license is needed to use it, whether or not license fees are payable.

Pittsburgh Sleep Quality Index (PSQI)

Background

The Pittsburgh Sleep Quality Index (PSQI) was used to measure the quality and patterns of sleep for the participants. It asks about the quality of sleep at night over the past month. Higher scores indicate worse sleep quality - lower scores are better.

Details on the PSQI may be obtained from the University of Pittsburgh - Department of Psychiatry, http://www.psychiatry.pitt.edu/node/8240 along with a copy of the form and scoring instructions. The PSQI was originally published in 1989, (Buysse et al. 1989).

The PSQI yields an overall sleep quality score ranging from 0 (best sleep quality) to 21 (worst sleep quality); total scores > 5 are considered to be an indication of poor sleep quality. The total score is a sum of 7 component scores of sleep (ranging from 0-3) for:

- duration
- disturbance
- latency
- day dysfunction due to sleepiness
- efficiency
- overall sleep quality
- needing meds to sleep

Mental Health Continuum - Mental Health Survey (MHC)

Background

The Mental Health Continuum - Mental Health Survey (MHC) form used in this study is the 14-item short form version. The MHC was created by Corey Keyes at Emory University, (Keyes 2002).

MHC Short Form: 14 Items

The short form 14 item version asks how often in the past month the respondent felt "X" - each of these 14 feelings and thoughts are listed below. Each item is rated from 0 (never) to 5 (every day). The final scoring provides an indication of whether each participant is "flourishing", "languishing", or "moderately mentally healthy". See more at http://bttop.org/sites/default/files/public/MHC-SF%20Brief%20Introduction%209.22.2014.pdf.

How often in the past month have you felt?

1. happy
2. interested in life
3. satisfied
4. that you had something important to contribute to society
5. that you belonged to a community (like social group, your neighborhood, your city)
6. that our society is becoming a better place for people
7. that people are basically good
8. that the way our society works makes sense to you
9. that you liked most parts of your personality
10. good at managing the responsibilities of your daily life
11. that you had warm and trusting relationships with others
12. that you have experiences that challenge you to grow and become a better person
13. confident to think or express your own ideas and opinions
14. that your life has a sense of direction or meaning to it

Spiritual/Quality of Life Survey (FACIT-sp)

Background

The Functional Assessment of Chronic Illness Therapy - Spiritual Well-Being (FACIT-sp), see http://www.facit.org/FACITOrg/Questionnaires.

The FACIT survey was used to provide a quality of life battery to tap into both traditional religiousness dimensions (faith factor) and spiritual dimensions (meaning and peace factor). These factors have been shown to have a strong association with psychological

adjustments in that individuals who score high on this scale are much more likely to report a generally enjoyable life.

Expanded 23 item version

The 23-item expanded version, *FACIT-Sp-Ex: Functional Assessment of Chronic Illness Therapy - Spiritual Well-Being, Expanded version*, scoring instructions yields 4 scores:

- Meaning/peace score (ranging from 0-32)
- Faith score (ranging from 0-16)
- Sp-12 score (ranging from 0-48)
- Sp-EX overall score (ranging from 0-92)

Items:

1. I feel peaceful
2. I have a reason for living
3. My life has been productive
4. I have trouble feeling peace of mind
5. I feel a sense of purpose in my life
6. I am able to reach down deep into myself for comfort
7. I feel a sense of harmony within myself
8. My life lacks meaning and purpose
9. I find comfort in my faith or spiritual beliefs
10. I find strength in my faith or spiritual beliefs
11. My illness has strengthened my faith or spiritual beliefs
12. I know that whatever happens with my illness, things will be okay
13. I feel connected to a higher power (or God)
14. I feel connected to other people
15. I feel loved
16. I feel love for others
17. I am able to forgive others for any harm they have ever caused me
18. I feel forgiven for any harm I may have ever caused
19. Throughout the course of my day, I feel a sense of thankfulness for my life
20. Throughout the course of my day, I feel a sense of thankfulness for what others bring to my life
21. I feel hopeful
22. I feel a sense of appreciation for the beauty of nature
23. I feel compassion for others in the difficulties they are facing

General Anxiety Survey (GAD7)

Background

The General Anxiety Survey (GAD7) was used to measure anxiety levels, see
http://www.phqscreeners.com/. Lower scores indicate minimal anxiety levels. Scores can
be interpreted as follows:

- 0-4 Minimal Anxiety
- 5-9 Mild Anxiety
- 10-14 Moderate Anxiety
- 15-21 Severe Anxiety

Items

Seven items ask "Over the past 2 weeks, how often have you been bothered by the
following problems..." Responses range from 0 (not at all sure) to 3 (nearly every day):

1. Feeling nervous, anxious or on edge
2. Not being able to stop or control worrying
3. Worrying too much about different things
4. Trouble relaxing
5. Being so restless that it is hard to sit still
6. Becoming easily annoyed or irritable
7. Being afraid as if something awful might happen.

One final question - responses range from 0 (not difficult at all) to 3 (extremely difficult):

8. If you checked off any of the above problems, how difficult have these problems made
   it for you to do your work, take care of things at home or get along with other people?

Total Scores range from 0 (minimal anxiety) to 21 (severe anxiety).

Reproductive Health Survey (REPR)

Background

The Reproductive Health Survey (REPR) gathered information on:

- AGE AT SURVEY
- MENARCHE
- MENSTRL PAST YEAR
- REASON NO MENSTRUAL
- REASON NO MENSTRL TEXT
- MENSTRUAL DATE

- AGE LAST MENSTRUAL
- M CYCLE
- EVER PREGNANT
- TOTAL PREGNANCIES
- LIVEBIRTH
- BRSTFEED
- BRSTFEED HOWMANY CHILD
- BRSTFEEDLEN
- MISCARRIAGES
- STILLBIRTHS
- ABORTIONS
- ECTOPICPREG
- VAGINAL PREG
- CSECTION
- CSECTION NUMBER
- Other questions (RHQ143, RHQ152, RHQ162, RHQ172, RHQ173, RHQ180, RHQ190, RHQ197, RHQ200, RHQ205)
- MENOPAUSE
- MENOPAUSEAGE
- SURGICALMENOPAUSE
- COMPLETEHYSTERECTOMY
- PARTIALHYSTERECTOMY
- TUBALLIGATION
- TUBALLIGATIONAGE
- HORMONEREPLACE
- MENSTRL REPRODUCTIVE

Instruments

Overview - Instruments

The following instruments were used for physical measurements performed:

Automatic Blood Pressure Monitor

Blood pressure was taken on the arm - resulting in two numbers, one high (systolic pressure (in mm Hg), and one low, diastolic pressure (in mm Hg)). Systolic is the first vessel constriction then Diastolic is the second stage of vessel constriction. The upper limit of normal blood pressure is 120/80.

Normal Ranges/Interpretation

Rating	Systolic	and/or	Diastolic
Normal	<120	and	<80
Prehypertension	120-139	or	80-89
Stage 1 Hypertension	140-159	or	90-99
Stage 2 Hypertension	>=160	or	>=100

Heart Rate was also measured and reported (in beats per minute, bpm).

- Normal range: 60-100 bpm
- Bradycardia: <=60 bpm
- Tachycardia: >=100 bpm

Body Composition - overview

Body composition and bone density were measured. They measured the distribution of the participant's body tissue (fat and muscle) and how strong their bones were. Using these data, BMI, waist-hip ratio, total percent body fat, lean tissue mass and total fat mass were then reported back to each participant.

Tanita Body Composition Analyzer

BIA (Bioelectrical Impedance Analysis technique which is based on the fact that lean tissues have a high water and electrolyte content, and thus provide a good electrical pathway. Fat mass contains a lower percentage of body water, and thus is a poor conductor of the electrical signal. By inducing a low energy, high frequency, electrical signal (50kHz, 500 microamp), a measurement of the baseline resistance to the flow of electrical current can be made. This current is passed through the anterior electrode on the scale platform, and the voltage drop is then measured on the posterior electrode. The resistance measurement relates directly to the volume of the conductor which is used to determine total body water, lean body mass, and finally, fat mass. Percent body fat, as calculated by Tanita, is highly researched proprietary formula combining impedance and weight measurements with height, gender, and age information. It is looked upon a chart of percentages among age groups and gender.

Measurements include:

- Weight- total body weight which includes muscle, bone, fat, water, etc.
- BMI- Correlates physical stature and body weight with mortality ratios like diabetes, cardio-pulmonary disease, cancer, etc. BMI is recognized as a valid assessment tool in identifying obese individuals. Body composition analysis may provide more information regarding actual changes in composition over an extended period of time.
- BMR- Basal metabolic rate measures the energy expended by the body to maintain normal body functions such as respiration and circulation.
- Impedance – measured in Ohms, the impedance value reflects how hard a mild electrical signal has to work to travel through the body. Lean mass (containing water and electrolytes) conducts the current, while fat mass acts as a resistor to the current.

A standard range for impedance is 200-650. Do not compare impedance values among different people.

- Fat mass - Actual fat mass (in pounds, kilos, k or st. pounds) in the body.
- Fat Percent
- FFM (fat free mass)- Fat free mass (in pounds, kilos, or st. pounds) is comprised of muscle, bone, tissue, water, and all other fat free mass in the body. A healthy ratio for fat free mass to fat mass is approximately 5:1 for females, and 7:1 for males. Males carry more muscle than females therefore have a higher FFM.
- TBW (total body water) – (in pounds, kilos, or st. pounds) reflects the amount of water in the body. This monitors the hydration level. TBW/weight X 100= % hydration. According to dialysis standards, women should be approximately 50-60% hydrated, and males should be 60-70% hydrated.
- Body Type
- Age
- Gender

Normal Ranges/Interpretation

Gender	Age	Underfat	Healthy	Overfat	Obese
Female	20-39	0-20%	21-32%	33-37%	38-50%
	40-59	0-23%	24-33%	34-39%	40-50%
	60-79	0-24%	25-36%	37-43%	44-50%
Male	20-39	0-7%	8-20%	21-25%	26-50%
	40-59	0-11%	12-23%	24-28%	29-50%
	60-79	0-13%	14-25%	26-30%	31-50%

Lunar iDXA Bone Density and Body Composition

Name of Equipment: Lunar iDXA, GE Medical Systems, ME+200156

Bone density is a measurement of how well the body captures calcium while building bones. Calcium is not static in the system, this mineral can move in and out of bones depending on a person's nutrition, stress levels, and general health.

Ranges and Interpretation

Total Densitometry Range from 0-1.3

Gender	Normal	Osteopenia	Osteoporosis
Women	1.181-1.282	0.777-0.979	0.575-0.777
Men	1.100-1.402	0.998-1.099	<0.998

iDXA Data Fields include:

- T-score
- Z-score
- Total Body Right Trunk Composition Fat
- Total Body Right Trunk Composition Lean
- Total Body Right Trunk Composition Region Fat
- Total Body Right Trunk Composition BMC
- Total Body Right Trunk BMD
- Total Body Right Arm Composition Total Mass
- Total Body Right Trunk Area
- Total Body Right Trunk BMC
- Total Body Right Trunk Composition Tissue
- Total Body Right Trunk Composition Tissue Fat
- Total Body Right Leg Composition Fat
- Total Body Right Leg Composition Lean
- Total Body Right Leg Composition Region Fat
- Total Body Right Leg Composition BMC
- Total Body Right Leg BMD
- Total Body Right Trunk Composition Total Mass
- Total Body Right Leg Area
- Total Body Right Leg BMC
- Total Body Right Arm Composition Tissue Fat
- Total Body Right Arm Composition Tissue
- Total Body Legs Area
- Total Body Legs BMC
- Total Body Legs BMD
- Total Body Legs Composition Total Mass
- Total Body Left Total Composition Total Mass
- Total Body Left Total Composition Region Fat
- Total Body Left Total Composition Tissue
- Total Body Left Total Composition Tissue Fat
- Total Body Pelvis Area
- Total Body Pelvis BMC
- Total Body Right Arm Composition Fat
- Total Body Right Arm Composition Lean
- Total Body Right Arm Composition Region Fat
- Total Body Right Arm Composition BMC
- Total Body Right Arm BMD
- Total Body Pelvis BMD
- Total Body Right Arm Area
- Total Body Right Arm BMC

- Total Body Right Leg Composition Tissue
- Total Body Right Leg Composition Tissue Fat
- Total Body Total %AM
- Total Body Total Z-score
- Total Body Total Area
- Total Body Total Composition Total Mass
- Total Body Total Composition Tissue Fat
- Total Body Total Composition Lean
- Total Body Total Composition Region Fat
- Total Body Total Composition Tissue
- Total Body Total BMC
- Total Body Total BMD
- Recall
- Recommendation
- Total Body Trunk BMD
- Total Body Trunk BMC
- Total Body Total %YA
- Total Body Total T-score
- Total Body Trunk Area
- Total Body Total Composition Fat
- Total Body Total Composition Centile
- Total Body Right Total Composition Fat
- Total Body Right Total Composition Lean
- Total Body Right Total Composition Region Fat
- Total Body Right Total Composition BMC
- Total Body Right Total BMD
- Total Body Right Leg Composition Total Mass
- Total Body Right Total Area
- Total Body Right Total BMC
- Total Body Right Total Composition Tissue
- Total Body Right Total Composition Tissue Fat
- Total Body Spine BMC
- Total Body Spine BMD
- Total Body Total Composition BMC
- Total Body Spine Area
- Total Body Ribs BMD
- Total Body Right Total Composition Total Mass
- Total Body Ribs Area
- Total Body Ribs BMC
- Total Body Left Total Composition Lean

- Total Body Left Total Composition Fat
- Total Body Gynoid Composition Tissue Fat
- Total Body Gynoid Composition Total Mass
- Total Body Head Area
- Total Body Gynoid Composition Tissue
- Total Body Gynoid Composition Region Fat
- Total Body Gynoid Composition BMC
- Total Body Gynoid Composition Fat
- Total Body Gynoid Composition Lean
- Total Body Head BMC
- Total Body Head BMD
- Total Body Trunk Composition Tissue Fat
- Total Body Trunk Composition Total Mass
- Total Body Left Arm Area
- Total Body Trunk Composition Tissue
- Total Body Trunk Composition Region Fat
- Total Body Trunk Composition BMC
- Total Body Trunk Composition Fat
- Total Body Trunk Composition Lean
- Total Body Fat Mass Ratio Legs/Total
- Total Body Fat Mass Ratio Trunk/Total
- Total Body Arms Composition Tissue Fat
- Total Body Arms Composition Total Mass
- Total Body Android Composition BMC
- Total Body Arms Composition Tissue
- Total Body Arms Composition Region Fat
- Total Body Arms Composition BMC
- Total Body Arms Composition Fat
- Total Body Arms Composition Lean
- Total Body Android Composition Fat
- Total Body Android Composition Lean
- Total Body Arms BMC
- Total Body Arms BMD
- Total Body Fat Mass Ratio Extremities/Total
- Total Body Arms Area
- Total Body Android Composition Total Mass
- Total Body Android Composition Region Fat
- Total Body Android Composition Tissue
- Total Body Android Composition Tissue Fat
- Total Body Left Arm BMC

- Total Body Left Arm BMD
- Total Body Left Leg BMC
- Total Body Left Leg BMD
- Total Body Left Leg Composition BMC
- Total Body Left Leg Area
- Total Body Left Trunk Composition Total Mass
- Total Body Left Trunk Composition Region Fat
- Total Body Left Trunk Composition Tissue
- Total Body Left Trunk Composition Tissue Fat
- Total Body Left Leg Composition Fat
- Total Body Left Leg Composition Lean
- Total Body Left Total BMC
- Total Body Left Total BMD
- Total Body Left Total Composition BMC
- Total Body Left Total Area
- Total Body Left Leg Composition Total Mass
- Total Body Left Leg Composition Region Fat
- Total Body Left Leg Composition Tissue
- Total Body Left Leg Composition Tissue Fat
- Total Body Left Trunk Composition Lean
- Total Body Left Trunk Composition Fat
- Total Body Left Arm Composition Tissue Fat
- Total Body Left Arm Composition Total Mass
- Total Body Legs Composition BMC
- Total Body Left Arm Composition Tissue
- Total Body Left Arm Composition Region Fat
- Total Body Left Arm Composition BMC
- Total Body Left Arm Composition Fat
- Total Body Left Arm Composition Lean
- Total Body Legs Composition Fat
- Total Body Legs Composition Lean
- Total Body Left Trunk BMC
- Total Body Left Trunk BMD
- Total Body Left Trunk Composition BMC
- Total Body Left Trunk Area
- Total Body Legs Composition Tissue Fat
- Total Body Legs Composition Region Fat
- Total Body Legs Composition Tissue
- Assessment

Waist-to-Hip Measurement

Description of Equipment: The measurements of the waist and hips were done with measuring tape. Once measured (in cm), the waist and hip circumferences are divided = waist/hip. Example for a man waist is 40" and a 38" (inches) hip would be (40/38) = 1.05 which may indicate that they are at a higher risk for disease. Each measurement was made 3 times and the average computed. The "umbilicus" was also measured which is the waist measurement at the "belly-button".

The NIH provided a protocol for the measurement of waist circumference for the Multi-Ethnic Study of Atherosclerosis (MESA) study. This protocol indicates that the waist measurement should be made at the level of the umbilicus or navel. However, published reports indicate that measurements of waist circumference made at the level of the umbilicus may underestimate the true waist circumference (CROFT et al. 1995). Some studies have assessed the waist circumference at the point of the minimal waist (Ross et al. 2008).

Normal Ranges/Interpretation

Men	Women	Disease Risk
< .95	< .80	Very Low
0.96-0.99	0.81-0.84	Low
> 1.00	> 0.85	High

Holtain Skin Fold Thickness Calipers

Name of Equipment: Anthropometric Measurement Techniques Holtain Calipers

Description of Equipment: Measurement of body girths at different sites such as: Chest (men), Abdomen (men), Thigh (men and women), Triceps (women), Supraillium (women). The reason being is that most men collect all of their fat in the abdomen and chest. Most women collect fat in the triceps and around the waist and thighs. Calipers are one of the few measurements to take because of cost and time.

Type of Measurement: Measuring the body fat area then calculated the measurements a total of three attempts. The calculation answer will be the BMI which is then categorized along with your height and weight and age. This determines if you are under the underweight, normal, overweight, and obese category. Measurements range from 0-100 mm.

Data fields reported:

- TOTAL_BODYFAT
- SF_TRICEPS3
- SF_TRICEPS2
- SF_TRICEPS1
- SF_THIGH3

- SF_THIGH2
- SF_THIGH1
- SF_SUPRAILIAC3
- SF_SUPRAILIAC2
- SF_SUPRAILIAC1
- SF_SUBSCAPULAR3
- SF_SUBSCAPULAR2
- SF_SUBSCAPULAR1
- SF_MIDAXILLARY3
- SF_MIDAXILLARY2
- SF_MIDAXILLARY1
- SF_CHEST3
- SF_CHEST2
- SF_CHEST1
- SF_ABDOMINAL3
- SF_ABDOMINAL2
- SF_ABDOMINAL1
- NOTES
- MEASUREMENT_TYPE
- INCOMPLETE

GE T2100 Treadmill Modified Blake Protocol

Name of Equipment: GE Treadmill 2100

Description of Equipment: Our fitness test that was completed on the treadmill is known as the Bruce Protocol. This test measures the participant's ability to adjust to increasing levels of exercise. Unlike a doctor's office stress test, we are not pushing people to a level of exercise that they are not comfortable with. Instead, a target heart rate is used that is based on established data for each person's age and gender.

Type of Measurement: Exercise level by using the participant's target heart rate which is 220-age. Example 220-25 = 195.

Measurements reported:

Field Description	Integer	Digits	Units
Target Heart Rate	positive	0-300	BPM
Grade	positive	0-30%	percentage
Miles Per Hour (mph)	positive	0-6	MPH
MET	positive	0-24	whole number
Modified Balke Protocol	pick list (yes or no)	a protocol	a protocol
Bruce Protocol	pick list (yes or no)	a protocol	a protocol

VO2 Max Estimate	positive	calculated equation	volume of oxygen
Heart Rate	positive	0-200	BPM

Vivid 7 Ultrasound Caroid IMT

Name of Equipment: GE Vivid 7 Ultrasound

Description of Equipment: This is a measure of how thick the wall of the artery in the participant's neck (carotid artery) is. That is one measure of the status of their blood vessels. In a group of very healthy people age 20-70 years, carotid IMT increased on average with age (see graph). However, some older people had low numbers. We think the low numbers are healthier and we will discover whether that is the case by studying a large number of people over time, including you. For example, the report could say "Your carotid IMT is *0.42 mm* and the large star on the graph shows where you fit in the normal population."

Type of Measurement: Measures thickness of carotid artery.

Normal Ranges/Interpretation: This result indicates that your carotid IMT thickness is less than the average for people your age, possibly indicating better than average vascular health.

Measurements include:

Field Description	Integer	Digits	Units
RCNW (mm)	positive	0.001-1.0	mm
RCRW (mm)	positive	0.001-1.0	mm
Right Mean Carotid IMT (mm)	positive	0.001-1.0	mm
LCNW (mm)	positive	0.001-1.0	mm
LCFW (mm)	positive	0.001-1.0	mm
Left Mean Carotid IMT (mm)	positive	0.001-1.0	mm
Plaque (yes or no)	yes or no	yes or no	yes or no

SphygmoCor Pulse Wave Velocity

Name of Equipment: SphygmoCor Pulse Wave Analysis, SCOR-PX

Description of Equipment: This is a special measure of blood pressure that interprets the pulse wave generated by the beating heart to estimate the pressure in your aorta, the large blood vessel that carries blood from the heart throughout the body. There is some evidence that this measure of blood pressure is a better predictor of how healthy your blood vessels are than blood pressure the usual way it is taken.

Approximate Time to Complete: 15 minutes

Type of Measurement: Average Pulse height, Pulse height variation, Diastolic variation, Shape deviation, and your central blood pressure.

Normal Ranges/Interpretation: Average Pulse height - greater than 80, Pulse height variation- less than 5, Diastolic variation- less than 5, Shape deviation- less than 2.

Measurements include:

Field Description	Integer	Digits	Units
Central Systolic Pressure	positive	0-300	mmHg
Central Diastolic Pressure	positive	0-300	mmHg
Central Pulse Pressure	positive	0-200	mm Hg
Central Augment Index	positive	0-100	percentage
Augmentation Pressure	positive	0-100	mmHg*ms

Itamar Endo-Pat2000

Name of Equipment: Itamar Endo-PAT2000 (EP), Itamar Medical Ltd.

Description of Equipment: The Endo-PAT2000 device is a non-invasive, intended for use as a diagnostic aid in the detection of coronary artery Endothelial Dysfunction (positive or negative) using a reactive hyperemia procedure.

Type of Measurement: Any kind of dysfunction in the Endothelial layer means some of some blockage in the body.

This device aids in the detection of the overall functioning of the arteries in the heart. The results from the Endo-Pat have been shown to be predictive of early heart disease and artery dysfunction but is not intended to be diagnostic. Reactive Hyperemia Index (RHI) and Augmentation Index (AI) are reported.

Normal Ranges/Interpretation for RHI:

- RHI > 1.67-Normal, Above 1.67 means there is no Endothelial Dysfunction.
- RHI < 1.67-Abnormal, Below 1.67 means there is Endothelial dysfunction.

Flow Mediated Dilation Ultrasound

Data Fields:

- PARTICIPANT_FASTING
- OPERATOR
- NOTES
- INCOMPLETE
- HYPEREMIA_VTI
- HYPEREMIA_QRS3
- HYPEREMIA_QRS2

- HYPEREMIA_QRS1
- HYPEREMIA_PEAKV
- HYPEREMIA_MEAN
- HYPEREMIA_HR
- FMD_PCT
- DATE_PERFORMED
- BASELINE_VTI
- BASELINE_QRS3
- BASELINE_QRS2
- BASELINE_QRS1
- BASELINE_PEAKV
- BASELINE_MEAN
- BASELINE_HR
- AFTER_BLOOD_DRAW
- ABSOLUTE_CHANGE

Labs General and Research (LABS)

Laboratory General

The following general laboratory measurements were performed:

- Lipid panel
    - Triglycerides
    - Total cholesterol
    - HDL
    - LDL
    - CHOL/HDLC ratio
    - non-HDL cholesterol
- Microalbumin, random urine
    - Random Urine Creatinine
    - Microalbumin
    - Microalbumin/creatinine ratio
- Iron and total iron binding capacity
    - Iron, total
    - Iron binding capacity
    - % saturation
- Comprehensive metabolic panel
    - Glucose
    - Urea nitrogen (BUN)
    - Creatinine

- EGFR, non-African American
- EGFR, African American
- BUN/Creatinine ratio
- Sodium
- Potassium
- Chloride
- Carbon dioxide
- Calcium
- Protein, total
- Albumin
- Globulin
- Albumin/globulin ratio
- Bilirubin, total
- Alkaline phosphatase
- AST
- ALT
- CBC
  - WBC
  - RBC
  - Hemoglobin
  - Hematocrit
  - MCV
  - MCH
  - MCHC
  - RDW
  - Platelet count
  - Absolute neutrophils
  - Absolute lymphocytes
  - Absolute monocytes
  - Absolute eosinophils
  - Absolute basophils
  - Neutrophils
  - Lymphocytes
  - Monocytes
  - Eosinophils
  - Basophils
- Compounds, proteins and hormones
  - C-reactive protein
  - Ferritin
  - Vitamin B-12

- Insulin
- TSH (thyroid stimulating hormone), 3rd generation
- Estradiol
- Testosterone
- Free testosterone
- Testosterone bioavailable
- SHBG
- Albumin serum
- Vitamin D
  - Vitamin D, 25-OH, total
  - Vitamin D, 25-OH, D3
  - Vitamin D, 25-OH, D2

Endocrine Health:

Insulin: Insulin is a hormone that regulates blood glucose (blood sugar) and is released from the beta cells of the pancreas. High blood glucose, which typically happens after eating a meal, stimulates the release of insulin, whereas low blood glucose levels inhibits insulin release. Insulin levels measured while fasting can give information about the body's sensitivity to insulin. This is a test that measures the amount of insulin in your blood.

- Insulin Ideal range < 16 uIU/mL

Testosterone: Testosterone is a steroid hormone. It is produced primarily in the testes in males and in the ovaries in females. Alternative forms of testosterone are produced in the adrenal glands and may have similar effects to both sexes. Testosterone levels are important for normal growth and development, adult reproductive health, and contribute to a variety of physical features such as male-pattern hair growth. The range of normal testosterone levels depends on age and sex. The proportion of estradiol to testosterone is often an important health indicator.

- Testosterone Ideal Range: 250 - 1100 NG/DL

Thyroid Stimulating Hormone (TSH): TSH is measured as a screening test for thyroid function. This test measures the amount of TSH in the blood. The measurement provides more information about endocrine health.

- TSH Ideal Range: 0.4-4.5 MIU/L

Immune Health

White Blood Cells: White blood cells, also known as leukocytes, help fight infections. There are five major types of white blood cells: Basophils, Eosinophils, Lymphocytes (T cells and B cells), Monocytes, Neutrophils. This test counts the amount of white blood cells you have in your blood. Your body produces more white blood cells when you have an infection, allergic reaction, or if you are under stress.

- WBC Ideal Range: 3.8 - 10.8 THOUS/MCL
- Critical Ranges: < 2.5 or > 50.0

Red Blood Cells: Red blood cells contain hemoglobin, which carries oxygen. The amount of oxygen your body uses is dependent on the number of RBCs you have. This test counts the amount of RBCs in your blood.

- RBC Ideal Range: 4.2 - 5.8 MILL/MCL

Hemoglobin: Hemoglobin is a protein in red blood cells that carries oxygen. This test measures how much hemoglobin you have in your blood.

- Hemoglobin ideal range: 13.2 - 17.1 G/DL
- Critical: <8.0 g/dL

Hematocrit: The hematocrit blood test measures the number of red blood cells and the size of red blood cells. It gives a percentage of red blood cells found in whole blood. This test is almost always ordered as part of a complete blood count.

- Hematocrit ideal range: 38.5 - 50.0%
- Critical: < 25.0%

Platelets: Platelets are blood cells produced in the bone marrow that help the blood clot. The number of platelets in your blood gives some information about the health of your bone marrow. This test measures the platelet count in your blood.

- Platelets ideal range: 140 - 400 THOUS/MCL
- Critical: <50 or > 749

Inflammation Health

C-Reactive Protein (CRP-high sensitivity): C-Reactive protein is a molecule whose quantity in blood rises with the degree of systemic or generalized inflammation in a person's body. It does not indicate any specific infection or inflammatory process but is a marker for non-specific inflammation. Lower quantities are generally better.

- CRP ideal range: < 0.79 mg/dL

Metabolic Health

Albumin: Albumin is the protein of the highest concentration in the plasma and is made in the liver. The amount of albumin in the blood is a general indicator of nutritional health. This test measures the amount of albumin within the serum of blood.

- Albumin ideal range: 3.6 - 5.1 g/dL

Alkaline Phosphatase: Alkaline phosphatase is a protein found in all body tissues. Tissues with particularly high amounts of ALP include the liver, bile ducts, and bone. This test measures the amount of ALP in your blood and provides information relevant to liver and bone health.

- Alkaline Phosphatase ideal range: 40 - 115 U/L

Alanine Transaminase (ALT): This test measures the amount of the liver enzyme ALT in the blood. The measurement provides additional information about liver health.

- ALT ideal range: 9 - 60 U/L

Aspartate Aminotransferase (AST): AST is found in high concentration in heart muscle, liver cells, and skeletal muscle cells. This test provides additional information about liver health by measuring the amount of AST in the blood.

- AST ideal range: 10 - 35 U/L

Bilirubin: Bilirubin is a product that results from the breakdown of hemoglobin. Its concentration in the blood is primarily an indicator of how well the liver and the gallbladder are functioning.

- Bilirubin Ideal range: .2 - 1.2 mg/dL

Blood Urea Nitrogen (BUN): BUN is what forms when protein breaks down. A test can be done to measure the amount of urea nitrogen in the blood, which is a measure of kidney health.

- BUN Ideal range: 7 - 25 mg/dL

Chloride: Chloride is a negatively charged molecule in the fluid outside the body's cells. It works with other substances, including sodium, to help control the body's fluid level and acid-base balance. This test measures the amount of chloride in the blood.

- Chloride Ideal range: 98 - 110 mmol/L

Carbon Dioxide (CO_2): CO_2 levels in the blood are influenced by kidney and lung function. The kidneys are mainly responsible for maintaining the normal bicarbonate levels. This test provides information about your kidney and lung health by measuring the amount of carbon dioxide is in your blood, usually in the form of bicarbonate.

- CO_2 Ideal range: 21 - 33 mmol/L

Glucose: This test measures the amount of sugar (glucose) in the blood. The test may be used to diagnose or screen for diabetes and to monitor patients who have diabetes.

- Glucose Ideal range: 65 - 99 mg/dL
- Glucose Impaired fasting: < 50 or 100 - 126 mg/dL
- Glucose Suspect diabetes: > 126 mg/dL

Potassium: Potassium helps nerves and muscles communicate. It also helps move nutrients into cells and waste products out of cells. This test measures the amount of potassium in the blood.

- Potassium Ideal range: 3.5 - 5.3 mmol/L

Protein: This test is a rough measure of all the proteins found in the fluid portion of your blood. Specifically it looks at the total amount of two classes of proteins: albumin and globulin. This is a general measure of nutritional health.

- Protein Ideal range: 6.2 - 8.3 g/dL

Sodium: This test measures the amount of sodium in the blood. The level of sodium in your blood is a balance between the sodium in the food and drinks you consume and the amount in urine excreted.

- Sodium Ideal range: 135 - 146 mmol/L

Cholesterol: Cholesterol is a soft, wax-like substance found in all parts of the body. Your body needs a small amount of cholesterol to work properly. This test measures all the cholesterol and triglycerides in your blood.

- Cholesterol Ideal range: 125 - 200 mg/dL
- Cholesterol Borderline low: < 125
- Cholesterol Borderline high: 200 - 239
- Cholesterol High: > 240

Triglyceride: Triglycerides are a type of fat that is either made by your body or comes from the food you eat. When you eat, your body uses calories for immediate energy. Leftover calories are turned into triglycerides and stored in fat cells for later use. This test measures the amount of triglycerides in your blood.

- Triglyceride Ideal range: < 150 mg/dL

High Density Lipoprotein (HDL): The main function of HDL is to help soak up excess cholesterol from the walls of blood vessels and carry it to the liver, where it breaks down and is removed from the body in the bile. Studies of both men and women have shown that the higher your HDL, the lower your risk of coronary heart disease, thus HDL is sometimes referred to as "good" cholesterol.

- HDL Ideal range: > 39 mg/dL

Low Density Lipoprotein (LDL): This test measures how much LDL you have in your blood. LDL is a type of cholesterol. Too much LDL in the blood can clog arteries. This test is usually done to determine your risk for heart disease. The LDL test is usually done as part of a lipid analysis, which also check for total cholesterol, HDL, and triglycerides.

- LDL Ideal range: < 130 MG/DL (CALC)
- LDL Borderline high: 130 - 159
- LDL High: 160 - 189
- LDL Very high: > 190

Microvascular Health

Urine Microalbumin/Creatinine Ratio: Creatinine, a byproduct of muscle metabolism, is normally excreted into the urine on a consistent basis. Its level in the urine is relatively stable. Since the concentration (or dilution) of urine varies throughout the day, this property of creatinine allows its measurement to be used as a corrective factor in random urine samples. When a creatinine measurement is performed along with a random microalbumin, the resulting microalbumin/creatinine ratio approaches the accuracy of the 24-hour microalbumin test without the extended collection hassle.

- Urine Microalbumin/Creatinine Ratio Ideal range: < 30 mcg/mg creatinine
- Urine Microalbumin/Creatinine Ratio Microalbuminuria: 30 - 299
- Urine Microalbumin/Creatinine Ratio Clinical Albuminuria: > 300

Nutrition Screen

25-hydroxy Vitamin D : This test that measures the amount of 25-hydroxy vitamin D in the blood. This test is the most accurate measure of the amount of vitamin D in the body. You can obtain vitamin D from supplements or by exposure to sunlight.

- VIT-D Ideal range: 30 - 100 ng/mL
- VIT-D Optimal: >=30 ng/mL
- VIT-D Insufficiency: 20 - 30 ng/mL
- VIT-D Deficiency: <20 ng/mL

Vitamin B-12: This test that measures the amount of Vitamin B-12 in your blood. A Vitamin B-12 level can tell us information about your nutritional health.

- VIT B-12 Ideal range: 200 - 1100 PG/ML

Ferritin: The amount of ferritin in your blood (serum ferritin level) is directly related to the amount of iron stored in your body. Iron is important for producing red blood cells.

- Ferritin Ideal range: 20 - 380 NG/ML

Serum Iron: This is another test that measures how much iron is in your blood.

- Serum Iron Ideal range: 45 - 170 mcg/dL

Laboratory General - Data Fields:
- LG URINECREAT
- LG MICROALBUMIN
- LG ALBUM CREAT RATIO

- LG TOTCHOLESTEROL
- LG HDL
- LG TRIGLYCERIDES
- LG LDL

- LG CHOL HDLC RATIO
- LG NON HDL CHOL

- LG GLUCOSE
- LG BUN
- LG CREATININE
- LG EGFR NAM
- LG EGFR
- LG BUN CREAT RATIO
- LG SODIUM
- LG POTASSIUM
- LG CHLORIDE
- LG CO2
- LG CALCIUM
- LG PROTEIN
- LG ALBUMIN
- LG GLOBULIN
- LG ALB GLOB RATIO
- LG BILIRUBIN
- LG ALKPHOSPHATASE
- LG AST
- LG ALT

- LG D25TOTAL
- LG D25D2
- LG D25D3

- LG TSH

- LG WHITEBLOODCELL
- LG REDBLOODCELL
- LG HEMOGLOBIN
- LG HEMATOCRIT
- LG MCV
- LG MCH
- LG MCHC
- LG RDW
- LG PLATELET
- LG ABS NEUTHROPHILS
- LG ABS LYMPHOCYTES
- LG ABS MONOCYTES
- LG ABS EOSINOPHILS

- LG ABS BASOPHILS
- LG NEUTHROPHIS
- LG LYMPHOCYTES
- LG MONOCYTES
- LG EOSINOPHILS
- LG BASOPHILS

- LG TOT IRON CAPACITY
- LG IRON CAPACITY
- LG SATURATION

- LG FERRITIN
- LG B12
- LG C CREATIVE
- LG INSULIN
- LG ESTRADIOL
- LG TESTOSTERONE
- LG FREE TESTOSTERONE
- LG TESTOSTERONE BIOAVAIL
- LG SHBG
- LG ALBUMIN SERUM

Laboratory Research

The following research laboratory measurements were performed:

- HPLC redox
- MMP-9
- 4-Plex Data
- T-cell Data
- CD34

Introduction to Research Biomarkers (from the Health Action Report)

Research biomarkers are a group of tests that measure four processes that we believe will provide new definitions of what health is and give clues to new things that can be done to maintain health. These four processes (oxidative stress, inflammation status, regenerative potential and immune health) are believed to be "generic" markers of health. They will detect very early changes long before any disease occurs, but they are not specific to any one disease. When these processes go awry, the end result might be cancer, heart disease, Alzheimer's disease, diabetes, or cancer. If we are right, these measurements will become critical to health focused care. Your participation in the Center's activities is helping in a very real way to develop research information to determine their usefulness.

We believe that measurements of inflammation, immune function, oxidative stress and regenerative potential will be better predictors of health than the things we are now using. We have some information to support that idea. In this section, we will summarize measurements of those processes in you and tell you what we know (and don't know) about what these measurements mean at this point. As we discover further meaning of these tests, we will share that information with you.

Research Biomarkers

Oxidative Status (redox): All of our cells use oxygen for energy. Over time, some cellular processes can start to work improperly causing a condition called oxidative stress. This means that the cells are not fully converting oxygen to energy in the manner that they would in a completely healthy condition. Similar to a misfiring car engine, the fuel may not be used efficiently and harmful waste products can occur. The inefficient use of oxygen is measured in terms of being oxidized or reduced.

- Cys Redox result given in mV
- Typical range for healthy adults is -98 to -62 mV

- GSH Redox results given in mV
- Typical range for healthy adults is -155 to -121 mV

Inflammation Status: The immune system is important in providing protection against infections and plays a critical role in regulating healing responses. When called into action, immune cells cause inflammation through which they wall off and destroy infections and other abnormal conditions. If not regulated tightly, such inflammatory responses can turn against healthy tissues and cause a vast spectrum of chronic inflammatory diseases, such as rheumatoid arthritis, atherosclerosis, diabetes and Alzheimer's disease. The immune system is composed of trillions of cells which can be easily accessed in a blood sample and analyzed in sophisticated assay systems. The composition of the immune system changes over time, influenced by infectious experiences and exposure to environmental challenges. A major factor in shaping the immune system is age, as the ability to rebuild and maintain immune cells changes over life time. A careful analysis of the immune system can therefore provide insights into life stresses and biologic effects of the aging process and can reveal subtle changes long before individuals actually get sick.

- TNF-a usually analyzed and displayed as log(TNF-a)

Regenerative Potential: We each have the capacity to heal our organs and tissues from innate systems of repair. A key component of the innate repair system is the circulating precursor or stem cells that can be found circulating in the blood. These precursor cells can be isolated from your blood specimen and tested for activity. In general, a vigorous response to an injury or abnormal situation indicates a positive tendency toward being able to self-repair damages in tissues and organs.

- CD34 cells results given in cells/uL

Laboratory Research - Data Fields:

1. lr_cyss
2. lr_cys
3. lr_cysgsh
4. lr_gsh
5. lr_gssg
6. lr_ehgsh
7. lr_ehcys
8. lr_total_cys
9. lr_total_gsh
10. lr_IL_6
11. lr_tnf_a
12. lr_IL-8
13. lr_IFN-r
14. lr_cd34
15. lr_CD45+CD34+CD133+PERUL
16. lr_CD45+CD34+CD133+VEGF2+MNC
17. lr_CD45+CD34+CD133+VEGF2+CXCR4
18. lr_CD45MEDFREQOFCD34
19. lr_CD133+VEGF-ONCD45MED
20. lr_CD133+VEGF+ONCD45MED
21. lr_CD133-VEGF+ONCD45MED
22. lr_CD133-VEGF-ONCD45MED
23. lr_CD133+VEGF-ONCD34
24. lr_CD133+VEGF+ONCD34
25. lr_CD133-VEGF+ONCD34
26. lr_CD133-VEGF-ONCD34
27. lr_CD133+VEGF-ONMNCS
28. lr_CD133+VEGF+ONMNCS
29. lr_CD133-VEGF+ONMNCS
30. lr_CD133-VEGF-ONMNCS
31. lr_CD34+CD133+ONMNCS
32. lr_CD34+CD133-ONMNCS
33. lr_CD34-CD133-ONMNCS
34. lr_CD34-CXCR4+ONMNCS
35. lr_CD34+CXCR4+ONMNCS
36. lr_CD34+CXCR4-ONMNCS
37. lr_CD34-CXCR4-ONMNCS
38. lr_CXCR4-VEGF+
39. lr_CXCR4+VEGF+

40. lr_CXCR4+VEGF-
41. lr_CXCR4-VEGF-
42. lr_CXCR4-CD133+ONMNCS
43. lr_CXCR4+CD133+ONMNCS
44. lr_CXCR4+CD133-ONMNCS
45. lr_CXCR4-CD133-ONMNCS
46. lr_CXCR4-VEGF+ONCD45MED
47. lr_CXCR4+VEGF+ONCD45MED
48. lr_CXCR4+VEGF-ONCD45MED
49. lr_CXCR4-VEGF-ONCD45MED
50. lr_CXCR4-CD133+ONCD45MED
51. lr_CXCR4+CD133+ONCD45MED
52. lr_CXCR4+CD133-ONCD45MED
53. lr_CXCR4-CD133-ONCD45MED
54. lr_CXCR4-VEGF+ONCD34
55. lr_CXCR4+VEGF+ONCD34
56. lr_CXCR4+VEGF-ONCD34
57. lr_CXCR4-VEGF-ONCD34
58. lr_CXCR4-CD133+ONCD34
59. lr_CXCR4+CD133+ONCD34
60. lr_CXCR4+CD133-ONCD34
61. lr_CXCR4-CD133-ONCD34
62. lr_CD34-VEGF+ONMNCS
63. lr_CD34+VEGF+ONMNCS
64. lr_CD34+VEGF-ONMNCS
65. lr_CD34-VEGF-ONMNCS
66. lr_CD34-CD133+ONMNCS
67. lr_MMP-9/NGAL
68. lr_Isoleucine
69. lr_Valine
70. lr_Urea
71. lr_3-Hydroxybutyrate
72. lr_Acetate
73. lr_Acetone
74. lr_Alanine
75. lr_Citrate
76. lr_Creatine
77. lr_Creatinine
78. lr_Formate
79. lr_Glucose

80. lr_Glutamate+Glutamine
81. lr_1-Methylhistidine
82. lr_Lactate
83. lr_Leucine
84. lr_Lysine
85. lr_Ornithine
86. lr_Phenylalanine
87. lr_Proline
88. lr_Pyruvate
89. lr_Serine
90. lr_Succinate
91. lr_Tryptophan
92. lr_Tyrosine
93. lr_CD3+CD8+CELLS/UL
94. lr_CD3+CD4+CELLS/UL
95. lr_CD3+CELLS/UL

CHDWB Publications to Date

Research Published to date from the CHDWB Database and Related Collaborations

For the up to date list of publications resulting from the Predictive Health Institute dataset, see **https://predictivehealth.emory.edu/research/publications.html**

Final Processing Notes

R Packages Used

The analyses presented above and this report were completed using R (R Core Team 2017) with the following packages:

1. haven (Wickham and Miller 2017)
2. dplyr (? 2017)
3. tidyr (Wickham and Henry 2017)
4. psych (Revelle 2017)
5. knitr (Xie 2017a; Xie 2015; Xie 2014)
6. knitcitations (Boettiger 2017)
7. printr (Xie 2017b)
8. likert (Bryer and Speerschneider 2016)

R Session Info as of 2018-01-19 13:07:46

```
## R version 3.4.3 (2017-11-30)
## Platform: x86_64-w64-mingw32/x64 (64-bit)
## Running under: Windows 10 x64 (build 15063)
##
## Matrix products: default
##
## locale:
## [1] LC_COLLATE=English_United States.1252
## [2] LC_CTYPE=English_United States.1252
## [3] LC_MONETARY=English_United States.1252
## [4] LC_NUMERIC=C
## [5] LC_TIME=English_United States.1252
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## other attached packages:
##  [1] likert_1.3.5       xtable_1.8-2        ggplot2_2.2.1
##  [4] printr_0.1         knitcitations_1.0.8 knitr_1.18
##  [7] psych_1.7.8        tidyr_0.7.2         dplyr_0.7.4
## [10] haven_1.1.0
##
## loaded via a namespace (and not attached):
##  [1] Rcpp_0.12.13       compiler_3.4.3     plyr_1.8.4
##  [4] bindr_0.1          forcats_0.2.0      tools_3.4.3
##  [7] digest_0.6.12      gtable_0.2.0       jsonlite_1.5
## [10] lubridate_1.6.0    evaluate_0.10.1    tibble_1.3.4
## [13] nlme_3.1-131       lattice_0.20-35    pkgconfig_2.0.1
## [16] rlang_0.1.4        bibtex_0.4.2       rstudioapi_0.7
## [19] curl_3.0           yaml_2.1.16        parallel_3.4.3
## [22] bindrcpp_0.2       gridExtra_2.3      xml2_1.1.1
## [25] RefManageR_0.14.20 stringr_1.2.0      httr_1.3.1
## [28] rprojroot_1.3-2    grid_3.4.3         glue_1.1.1
## [31] R6_2.2.2           foreign_0.8-69     rmarkdown_1.8.5
## [34] bookdown_0.5.10    reshape2_1.4.2     purrr_0.2.4
## [37] magrittr_1.5       scales_0.5.0       backports_1.1.1
## [40] htmltools_0.3.6    assertthat_0.2.0   mnormt_1.5-5
## [43] colorspace_1.3-2   stringi_1.1.5      lazyeval_0.2.0
## [46] munsell_0.4.3
```

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