Documentation for Records without Data Collection Forms

Medications (Record 06)*:

Reference:

- Psaty BM, Lee M, Savage PJ, Rutan GH, German PS, Lyles M. Assessing the Use of Medications in the Elderly: Methods and Initial Experience in the Cardiovascular Health Study. J Clin Epidemiol 1992; 45:683-692.

All of the Record 06 medication variables are coded 0=No and 1=Yes, indicating whether the participant took a particular type of prescription medication.

Data on medications were collected during the home-interview component of the baseline examination and during the annual visits. Participants were asked to provide the interviewers with the containers of all their current prescription medications, and the interviewers transcribed the name of the drug, the strength, and the dosing instructions from the prescription label. A "current" prescription was one for which a prescription was written by a physician, filled by a pharmacist (or physician), and taken by the participant during the 2 weeks prior to the interview or annual visit. Prior to year 6, information on over-the-counter drugs was not collected except by self report for several medications such as aspirin. More detailed information about over-the-counter medications was collected beginning in year 6, though these data are not being released at this time.

Data entry and coding were accomplished with CHSMeds, a database of all prescription medications and some non-prescription medications. The original source of the medicine database in CHSMeds was the Master Drug Data Base (MDDB: Medi-Span, Indianapolis, IN). Medication data were entered into CHSMeds, after which the program checked to see if a matching medication existed in the database. If it did, then the medication was automatically and transparently coded with a unique National Drug Code (NDC) number and with one of the class codes developed by the American Hospital Formulary Society (AHFS). If a matching medication could not be found in the database, then the information was entered, and coding occurred later. The CHSMeds database was supplemented to include new drugs as well as both trade and generic names for most drugs.

*For more information regarding the background, rationale, definitions, and data collection procedures for the medications, please see the appropriate section of the Manual of Operations.

Pulmonary Data (Record 18):

Reference:

- Enright PL, Kronmal RA, Higgins M, Schenker M, Haponik EF. Spirometry Reference Values for Women and Men 65 To 85 Years of Age. The Cardiovascular Health Study. Am Rev Respir Dis 1993; 147:125-133.

Spirometry was used to test the pulmonary function of CHS study participants at baseline, Year 6, and Year 9. Just prior to spirometry testing, the pulmonary function technician asked the participant about bronchodilator or beta-blocker use, recent cigarette smoking, consumption of caffeine-containing drinks, and recent respiratory infections (see Record 11). The flow-volume curve (FVC) maneuver was both explained and demonstrated. Participants were sitting unless they were severely overweight, as determined by a body mass index of 35 kg/m^2 or more.

The FVC and the maneuver duration in seconds were displayed in real-time on the computer monitor as an incentive. At the end of every FVC maneuver, acceptability and reproducibility checks were applied, quality control messages were displayed, and the best three previous FVC curves from the test session were displayed superimposed in different colors. The FVC maneuver was repeated as many as eight times or until at least three acceptable and two reproducible FVC maneuvers were obtained.

Time zero of each maneuver was determined using the back-extrapolation technique. The FEV_1, FVC, FEF_{max}, back-extrapolated volume (BEV), and forced expiratory time (FET) were all computed by standardized techniques, with resolutions of 10-ml volume, 10-ml/s flow, and 0.1-s FET. BTPS correction was performed using the spirometer temperature sampled at the beginning of each test session (BTPS = body temperature and ambient pressure, saturated with water -- the condition of air in the lungs). The three acceptable FVC maneuver variables with the highest sum of FVC plus PEFR were stored by the spirometry system (PEFR = peak expiratory flow rate). The largest FEV_1 and the largest FVC from the three stored acceptable FVC maneuvers was reported.

Each week, all test sessions were reviewed at the Pulmonary Function Reading Center by a single QC supervisor. The QC workstation displayed the best three FVC maneuvers from a test session. The QC supervisor indicated her choice of the single best maneuver and the test session QC grade. The flow grade indicated the reliability of the FEV_1 , and the volume grade indicated the reliability of the FVC.

The FEV_1/FVC ratio (x 100%) is generally used as a sensitive index to separate patients with borderline to mild airflow limitation from those with normal spirometry.

Hematology (Record 23) and Blood Data (Record 44):

Reference:

- Cushman M, Cornell ES, Howard PR, Bovill EG, Tracy RP. Laboratory Methods and Quality Assurance in the Cardiovascular Health Study. Clinical Chemistry 1995; 41/2:264-270.

After an 8-12 hour fast, participants underwent phlebotomy by atraumatic venipuncture with a 21-gauge butterfly needle connected to a vacutainer (Becton Dickinson, Rutherford, NJ) outlet via a Luer adaptor. Blood samples were sent for analysis to the Central Blood Analysis Laboratory (CBAL) at the University of Vermont (Burlington, VT).

Hematology assays. Hematocrit, platelet, and white blood cell counts were measured on automated instruments at local hematology laboratories near each field center.

Clinical chemistry assays. A Kodak Ektachem 700 analyzer with reagents (Eastman Kodak, Rochester, NY) was used for albumin, creatinine, glucose, triglycerides, potassium, and uric acid. The Olympus Demand system (Olympus, Lake Success, NY) was used for cholesterol, high-density lipoprotein (HDL) cholesterol, and triglyceride determinations. Dextran sulfate/magnesium sulfate precipitation and enzymatic methods were used for cholesterol and HDL (Dow Diagnostics, Indianapolis, IN). Enzymatic methods were used to measure triglycerides, including a triglyceride blank with each sample to measure free glycerol (Technicon, Tarrytown, NY). Insulin was measured by competitive RIA (Diagnostic Products Corp., Malvern, PA). Calculated low-density lipoprotein (LDL) was not directly measured but calculated from HDL, total cholesterol, and triglycerides.

Coagulation factor assays. Fibrinogen was measured in a BBL fibrometer (Becton Dickinson, Cockeysville, MD) by the Clauss method with Dade fibrinogen calibration reference (Baxter-Dade, Bedford, MA) and bovine thrombin (Parke-Davis, Lititz, PA). Factor VII and factor VIII were measured on the Coag-A-Mate X2 (Organon-Teknika, Durham, NC). Factor VII activity was determined by using factor VII-deficient plasma (Baxter-Dade) and Thromborel S (Behring Diagnostics, Marburg, Germany) human placenta-derived thromboplastin. Factor VIII activity was determined by using factor VIII-deficient plasma (Organon-Teknika) and partial thromboplastin (Organon Teknika). An unassayed pooled normal plasma (George King Biomedical, Overland Park, KS) was used as the standard and calibrated with the World Health Organization reference plasma for both assays.

Baseline Nutrition Summary*:

References:

- Kumanyika S, Tell GS, Shemanski L, Polak J, Savage PJ. Eating Patterns of Community-Dwelling Older Adults: The Cardiovascular Health Study. AEP 1994; Vol. 4, No. 5: 404-415.

- Kumanyika S, Tell GS, Fried LP, Martel JK, Chinchilli VM. Picture-Sort Method for Administering a Food Frequency Questionnaire to Older Adults. Journal of the American Dietetic Association 1996; 96/2:137-144.

Nutrition summary data have been appended to the BASE2 database. These data were derived from the picture-sort data discussed below. The summary data includes percentage of kilocalories from fat, protein, carbohydrates, sweets, and alcohol. The daily average over a year was determined for the following nutritional variables: kilocalories, protein, fat, carbohydrates, calcium, phosphorus, iron, sodium, potassium, vitamin A, thiamin, riboflavin, niacin, vitamin C, saturated fat, oleic acid, linoleic acid, cholesterol, and fiber.

A picture-sort approach to administering the National Cancer Institute (NCI) ("Block") food frequency questionnaire was given to every participant in the original cohort at baseline. Dietary assessment data were available and judged to be of suitable quality for 4643 of the participants. What motivated the development of the picture-sort format was the need for an easy-to-administer but comprehensive dietary assessment for use in the initial interviews with CHS participants. Additionally, persons with poor reading skills or with impaired vision may have found it easier to identify foods using the picture-sort approach.

The NCI food list contains 99 items that were selected systematically to include foods contributing more than 90% of energy and more than 85% of several vitamin and mineral intakes as reported by respondents 18 years of age and older in the second National Health and Nutrition Examination Survey (NHANES II) database. The picture-sort included 96 of the 99 NCI food items. The three remaining items were for alcohol consumption, and questions about this were asked orally following the picture-sort. Each food or beverage item or group of items on the NCI food list was illustrated on a 5" by 7" card, was captioned with the name of the item(s), and was numbered in the order listed on the printed form of the NCI questionnaire. The medium portion listed on the NCI questionnaire was shown on the back of the card as a guide to the interviewer.

Each participant was given the stack of cards, in ascending numeric order corresponding to the position of the item on the printed NCI questionnaire, and was asked to sort them on a tray with five compartments, on the basis of the frequency of consumption during the past 12 months. The compartments corresponded to five categories, from left to right: "almost every day or at least five times per week", "about 1 to 4 times per week", "about 1 to 3 times per month", "about 5 to 10 times per year", or "never".

The dietary assessment also included a brief interview on other eating habit variables to assess the

frequency of eating selected foods in restaurants, duration of the current eating pattern, use of special diets and of low-salt and low-fat foods, fruit and vegetable consumption, and meal consumption patterns (see Record 25). Most of these questions were adapted from the NCI questionnaire. Beer, wine, and liquor consumption were assessed with questions on current practices (e.g., "Do you ever drink beer?"), with follow-up questions on frequency (e.g., "How often do you drink beer?" coded as daily, weekly, monthly, yearly, or rarely/never) and quantity (e.g., "How many 12-ounce cans or bottles of beer do you usually drink on one occasion?") where applicable.

The validity of the picture-sort approach as a way of administering the NCI food list was evaluated in an ancillary study of 47 female and 49 male CHS participants. Each participant in this substudy sorted the cards into the five piles as in the larger CHS study; in addition, the interviewer then went through each card in each pile to ask specific frequency per day, week, month, or year and address the portion size.

In addition to the picture sort, each participant in the substudy had six 24-hour recall interviews. The first interview was done immediately after the picture sort, and the five additional in-home interviews were conducted at approximately 1-month intervals. The 24-hour recall interview used a technique in which the participant was asked to describe in detail all items consumed within the 24-hour period before the interview. The interviews were scheduled so that no two interviews ever occurred on the same day of the week. The purpose of gathering the recall data was to test whether the correlation between the recall data and the picture-sort data was similar to correlations found in other studies between reference data and food frequency questionnaire data. The results were similar.

* For more information regarding the background, rationale, definitions, card sorting procedure, and supplementary questionnaire (Record 25), please see the appropriate section of the Manual of Operations.

Carotid Ultrasound (Records 41, 55 & 92):

Reference:

- O'Leary DH, Polak JF, Wolfson Jr. SK, Bond MG, Bommer W, Sheth S, Psaty BM, Sharrett AR, Manolio TA. Use of Sonography to Evaluate Carotid Atherosclerosis in the Elderly: The Cardiovascular Health Study. Stroke 1991; 22:1155-1163.

Carotid ultrasound scans were performed at baseline, Year 5 and Year 11. Because of evidence of reader drift between the two ultrasound visits, scans from the CHS baseline visit were reread by Year 5 readers. Original baseline readings are found in Record 41 of the ULTRABL database. Baseline re-reads are in Record 55 of the ULTRAYR5 database. Original Year 5 readings are in Record 41 of the ULTRAYR5 database. Both of these databases are located in the ULTRA folder. For over 99% of the participants, the Ultrasound Reading Center (URC) reader who read the Year 5 ultrasound study also reread that same participant's baseline carotid ultrasound scan. Year 11 ultrasound data are contained in Record 92 of the ULTRAY11 database located in the ULTRA folder.

In order to insure comparability across cohorts, analyses of CHS baseline carotid ultrasound measures using data from both CHS cohorts will need to utilize the Year 5 data for the African-American cohort (Record 41), and the baseline rereads (Record 55) for the original CHS cohort. In addition, in any longitudinal analyses involving both the baseline and Year 5 carotid ultrasound measurements, the baseline rereads should be used instead of the original baseline CHS carotid data. In analyses where a baseline carotid ultrasound measurement is the risk factor or outcome variable of interest, it is recommended that the average of the two baseline ultrasound readings (the original baseline and the baseline rereads) be used in the analysis.

The definition of the internal carotid artery encompassed the carotid bulb and the initial 10 mm of vessel distal to the tip of the flow divider that separates the external from the internal carotid artery. While the carotid bulb anatomically is incorporated into both the common carotid artery and the internal carotid artery, the decision to study it as part of the internal carotid artery was made for two reasons. The loss of parallel configuration, which marks the origin of the carotid bulb, is easily identified and serves as a consistent marker of the distal end of the common carotid artery. Also, plaques occur primarily along the outer wall of the internal carotid artery in the region of the carotid sinus opposite the flow divider. Because the protocol required three views of the proximal internal carotid artery, including the carotid bulb in that segment increased the likelihood of measurements being obtained of the largest plaque. The alternative approach of treating the carotid bulb as a segment separate from either the common carotid artery or the internal carotid artery was rejected because of time limitations imposed on the examination.

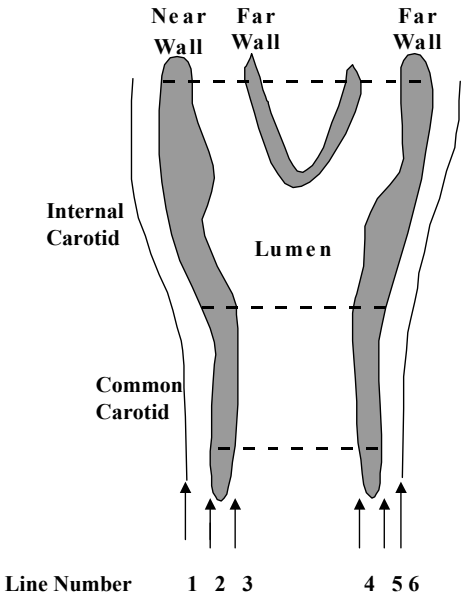
The distal end of the common carotid artery was defined as the beginning of the dilatation of the carotid bulb with loss of the parallel configuration of the near and far walls of the common carotid artery when this could be visualized, or as a point 8 mm proximal to the tip of the flow divider when the divergence of walls could not be demonstrated.

Carotid ultrasound data reflect measurements from four scans on each carotid artery (right and left

side) for each participant. For the common carotid, one view was obtained per side: the right side is numbered as Scan 1, and the left side is numbered Scan 5. For the internal carotid, three views (anterior, lateral, and posterior) were obtained per side. For the right side, Scans 2, 3, and 4 are associated with the anterior, lateral, and posterior views; and for the left side, Scans 6, 7, and 8 are associated with these views. CHS variables computed for both the right (Side 1) and left (Side 2) sides of the internal carotid artery (that is, not scan-specific) include percent stenosis, lesion surface, lesion morphology, lesion location, and lesion density and both Pulsed wave and Continuous wave Doppler maximum peak velocities. The above side and scan numbers are used in the suffixes of variable names (for example, PSTEN141 contains data for percent stenosis for the right side of the internal carotid artery).

The reader drew on each image up to six interface lines, according to the following conventions: line 1 as the periadventitia-adventitia interface of the near wall, line 2 as the adventitia-media interface of the near wall, line 3 as the intima-lumen interface of the near wall, line 4 as the lumen-intima interface of the far wall, line 5 as the media-adventitia interface of the far wall, and line 6 as the adventitia-periadventitia interface of the far wall. If an interface could not be visualized, no line was drawn. If an interface was interrupted, the line was similarly interrupted. (See Figure 1.)

Figure 1
Overview of CHS Carotid Artery Interfaces



For each scan, carotid intima-media thicknesses (IMT) were computed for both the near and far walls of the vessel. The minimum, mean, and maximum IMT measures were calculated using a computer algorithm based on the six lines drawn by the reader. Additionally, for each scan, the minimal and maximal lumen and the vessel maximum were computed. Near wall thicknesses of the intima-media complexes were calculated from the distances between lines 2 and 3, and far wall thicknesses were calculated from the distances between lines 4 and 5. The residual lumen measurements were calculated from the minimal distance between lines 3 and 4, representing the true lumen diameter, when both lines were drawn. If either line 3 or line 4 was not drawn, the computer program calculated the minimum distance between lines 2 and 4 (true lumen plus near wall), between lines 3 and 5 (true lumen plus far wall), or between lines 2 and 5 (true lumen plus near and far wall) for the measurement of lumen diameter.

Coding definitions:

1. Categorical Variables

(The wild card character * indicates that the codings apply to all variables which begin with those letters.)

Stenosis Ratings for the right and left side: (PSTEN*, MXSTEN*)
0=0% or Normal
1=1-24%
2=25-49%
3=50-74%
4=75-99%
5=100%

Lesion Surface Characteristics for the right and left side: (LSRFC*)
0=Smooth
1=Mildly Irregular
2=Markedly Irregular
3=Ulcerated

Lesion Morphology Ratings for the right and left side: (LMRPH*)
0=No Lesion
1=Homogeneous
2=Heterogeneous

Lesion Locations for the right and left side: (LOCAT*)
0=Normal
1=Internal
2=Bulb

Lesion Density Ratings for the right and left side: (LDENS*)
0=No Lesion
1=Hypoechoic

2=Isoechoic
3=Hyperechoic
4=Calcified

2. Continuous Variables

All Intima-Media Thickness variables and Vessel Maximum variables are given in millimeter units. Pulsed Wave and Continuous Wave Doppler measurements are maximum peak velocities and are given in m/sec units.

Aortic Ultrasound (Record 48):

Reference:

- Alcorn HG, Wolfson Jr. SK, Sutton-Tyrrell K, Kuller H, O'Leary D. Risk Factors for Abdominal Aortic Aneurysms in Older Adults enrolled in the Cardiovascular Health Study. Arteriosclerosis, Thrombosis, and Vascular Biology 1996;16:963-970.

Aortic ultrasound scans were performed on CHS participants in both cohorts during the CHS Year 5 visit. These data are found in Record 48 of the ULTRAYR5 database.

Participants underwent B-mode ultrasound of the abdominal aorta. The scanner was a Toshiba SSA 270A Color Doppler Duplex imager with a 3.75 MHZ convex probe. Aortic ultrasound data reflect measurements from four scans on the aorta for each participant. Scans 1, 2, 3, and 4 identify the transverse suprarenal, transverse infrarenal, longitudinal, and transverse widest portion of the aorta, respectively.

CHS variables computed for across all views of the aorta (that is, not scan-specific) include percent stenosis, lesion location, and lesion characteristics of the surface, morphology, and density. The above scan numbers are used in the suffixes of the variable names (for example, VMAX148 contains data for maximum vessel diameter for the transverse suprarenal view of the aorta).

For the longitudinal scan only, aortic intima-media thicknesses (IMT) were computed for both the near and far walls of the vessel. The minimum, mean, and maximum IMT measures were calculated using a computer algorithm based on the six lines drawn by the reader. Additionally, for all four scans, the minimal and maximal lumen and the vessel maximum were computed. Near wall thicknesses of the intima-media complexes were calculated from the distances between lines 2 and 3, and far wall thicknesses were calculated from the distances between lines 4 and 5. The residual lumen measurements were calculated from the minimal distance between lines 3 and 4, representing the true lumen diameter, when both lines were drawn. If either line 3 or line 4 was not drawn, the computer program calculated the minimum distance between lines 2 and 4 (true lumen plus near wall), between lines 3 and 5 (true lumen plus far wall), or between lines 2 and 5 (true lumen plus near and far wall) for the measurement of lumen diameter.

Coding definitions:

1. Categorical Variables

Stenosis Rating: (PSTEN48)

0=0% or Normal
1=1-24%
2=25-49%
3=50-74%
4=75-99%
5=100%

Lesion Surface Characteristic: (LSRFC48)

0=Smooth
1=Mildly Irregular
2=Markedly Irregular
3=Ulcerated

Lesion Morphology Rating: (LMRPH48)
0=No Lesion
1=Homogeneous
2=Heterogeneous

Lesion Location: (LOCAT48)
0=Normal
1=Internal
2=Bulb

Lesion Density Rating: (LDENS48)
0=No Lesion
1=Hypoechoic
2=Isoechoic
3=Hyperechoic
4=Calcified

2. Continuous Variables
All Intima-Media Thickness variables and Vessel Maximum variables are given in millimeter units.

Electrocardiogram (ECG) Data (Record 42)*:

References:

- Rautaharju PM, Manolio TA, Siscovick D, Zhou SH, Gardin JM, Kronmal R, Furberg CD, Borhani NO, Newman A. Utility of New Electrocardiographic Models for Left Ventricular Mass in Older Adults. Hypertension 1996; 28:8-15.

- Furberg CD, Manolio TA, Psaty BM, Bild DE, Borhani NO, Newman A, Tabatznik B, Rautaharju PM. Major Electrocardiographic Abnormalities in Persons Aged 65 Years and Older (the Cardiovascular Health Study). Am J Cardiol 1992; 69:1329-1335.

- Rautaharju PM, et al. Cardiac infarction injury score. An electrocardiographic coding scheme for ischemic heart disease. Circulation 1981;64:249-256.

Twelve-lead resting electrocardiograms (ECG) were obtained on participants at baseline and at each of the yearly visits.

ECG Methodology. The ECGs were obtained using the MAC PC-DT electrocardiographic recorder (Marquette Electronics Inc, Milwaukee, WI). The electrocardiographic recording consisted of 10 seconds of data from leads I, II, and V_1-V_6 sampled simultaneously with a sampling rate of 250 samples per second and lead. Leads III, aVR, aVL, and aVF were calculated from leads I and II. The ECGs stored in the MAC PC units were transmitted daily to the Electrocardiographic Reading Center (EPICORE Center, Division of Cardiology, University of Alberta, Canada) for analysis and classification with the Novacode ECG measurement and classification program. Results were sent to the CHS Coordinating Center for transfer into the central data base. No measurements were available for analysis from participants with electronic pacemakers since the pacemaker firing distorts ECG completion.

ECG technicians were trained to make a special effort to reduce chest electrode placement errors, thereby reducing interindividual variability and improving the consistency of serial ECG recordings. Careful attention was paid to proper identification of the fourth and fifth intercostal spaces for correct level of the chest electrodes and the left midaxillary line for the V_6 electrode location. In addition, a special electrode locator was used for positioning of the V_4 electrode at a 45° angle between the midsternal and left midaxillary lines at the fifth intercostal space. Electrodes V_3 and V_5 were then located in a straight line halfway between electrodes V_2 and V_4, and V_4 and V_6, respectively.

Abnormal ECGs. Any ECG classified as "Abnormal ECG" by the MAC/PC cardiograph required further review by the technician: the program quite frequently classified ECGs as abnormal in situations which did not require any special acute medical attention. Such conditions include reference to an old myocardial infarction and ventricular conduction defects, abnormal P or QRS axis, non-specific ST-T abnormalities, etc. Whenever the overall classification was "abnormal ECG" (the last printed diagnostic statement), the technician verified whether any of the preceding statements included any serious arrhythmias or reference to myocardial injury or ischemia due to possible recent myocardial infarction.

Alerts. The following statements qualified as alerts:

- Heart rate less than 50 or over 100
- Atrial Fibrillation
- Atrial Flutter
- Wolf-Parkinson White (WPW) or Ventricular Pre-Excitation
- Idioventricular Rhythm
- Ventricular Tachycardia
- Complete Heart Block
- Acute Pericarditis
- Any statement including reference to injury or ischemia.

The alert data are located in Record 21.

Cardiac Injury Score. For more on the calculation of the cardiac injury score, please see the third reference listed above.

Determination of Left Ventricular Mass (LVM). Traditionally, the Novacode program has been used for predicting LVM. It has algorithms for ECG classification according to the Minnesota code, classification of left ventricular hypertrophy (LVH) according to a variety of ECG criteria, and statistical multivariate models for estimation of echocardiographic LVM. However, we found that the Novacode model overestimated echocardiographic LVM in our study population. We developed our own electrocardiographic model, which includes adjustments for body weight, eliminated left ventricular mass prediction bias, and improved the correlation between echocardiographic and electrocardiographic left ventricular mass as compared to the Novacode model. A simpler, reduced subset of ECG variables was used for feature selection. The variables chosen were those that have shown potential, as single variables or as combinations, in earlier studies: RaVL, SV_3, RV_5, SV_1, TV_5, TV_6, JV_5, and QRS duration, where R is the R wave amplitude; S, the absolute value of the S wave amplitude; T, the signed value of the T wave; and J, the absolute value of the J-point depression. RV_5 and SV_1 are components of the traditional Sokolow-Lyon criterion for LVH used, for instance, in the Minnesota Code. RaVL and SV_3 are components of the Cornell voltage criteria for LVH. JV_5 measurement requires careful identification of the endpoint of QRS. Models for predicting LVM in normal ventricular conduction and in various categories of ECG abnormalities according to the Minnesota Code are shown on the next page. The LVM42 variable is based on these models, not the Novacode model.

Category	Model
Normal ventricular conduction and no MI	
Men	LVM=0.025(RaVL+SV_3)+21.54(Sqrt BW-2.7)
Women	LVM=0.024(RaVL+SV_3)+17.20(Sqrt BW-2.1)
Inferior MI	
Men and Women	LVM=1.26xQRS duration-0.085xTV_5+32.06(Sqrt BW-6.6)
Lateral or anterior MI	
Men and Women	LVM=1.41xQRS duration-0.042xTV_6+24.37(Sqrt BW-7.1)
Left bundle branch block	
Men and Women	LVM=TV_6(142-QRS duration)/66.7+50.41(Sqrt BW-5.1)
Right bundle branch block	
Men and Women	LVM=0.055(RaVL+SV_3)+1.39(QRS duration-120) + 25.77(Sqrt BW-5.1)
Indeterminate type ventricular conduction delay	
Men	LVM=0.40 JV_5+19.74(Sqrt BW-1.3)
Women	LVM=0.40 JV_5+19.74(Sqrt BW-0.5)

BW=Body Weight

* For more information regarding the background, purpose, definitions, alerts, ECG equipment and methods, and data collection procedures, please see the appropriate section of the Manual of Operations.

Echocardiography Data Baseline & Year 7 (Record 43):

Baseline Reference:

- Gardin JM, Wong ND, Bommer W, Klopfenstein HS, Smith VE, Tabatznik B, Siscovick D, Lobodzinski S, Anton-Culver H, Manolio TA. Echocardiographic Design of a Multicenter Investigation of Free-living Elderly Subjects: The Cardiovascular Health Study. Journal of the American Society of Echocardiography 1992; 5:63-72.

For each subject, a baseline echocardiogram was recorded, with a second echocardiogram done in Year 7, with a goal of determining whether changes in cardiac anatomy or function over a 5-year period are important predictors of morbidity or mortality from coronary heart disease and stroke. A comprehensive echocardiography protocol -- including M-mode, two-dimensional, and Doppler echocardiography -- was incorporated in the design of CHS. Presently, we are releasing only the baseline echocardiography data.

M-mode measurement methodology. The American Society of Echocardiography standards, featuring leading-edge to leading-edge methodology, were used for making all M-mode echocardiographic measurements. For M-mode echocardiographic, pulsed, and continuous wave Doppler parameters, measurements were made, when possible, from consecutive beats. The aortic root dimension was measured at the onset of the QRS complex and the left atrial dimension at its maximum during systole. For M-mode measurements on the left ventricle, left atrium, and aorta, all of which were derived from a cursor positioned on the two-dimensional image in the parasternal short-axis view, measurements were not made from beats recorded with the cursor at greater than 30-degree angle to the meridian. Similarly, to avoid making measurements from off-axis readings, M-mode ventricular measurements were not made when, in the absence of wall motion abnormalities, an eccentricity index existed in the two-dimensional parasternal short-axis view of ≥ 1.3 (i.e., when the radius of the left ventricular cavity in one axis was ≥ 1.3 times the radius of the cavity in another axis).

Three of the M-mode variables were calculated from the M-mode echocardiographic left ventricular measurements:

(1) left ventricular percentage fractional shortening:

$$\text{MMLVFS43} = \frac{\text{MMLVDD43} - \text{MMLVDS43}}{\text{MMLVDD43}} * 100\%$$

where MMLVDD43 is the left ventricular internal dimension at end-diastole, and MMLVDS43 is the left ventricular internal dimension at end-systole.

(2) left ventricular end-systolic meridional wall stress:

$$\text{NEWESS43} = \frac{0.334*\text{SUPSYS16} * \text{MMLVDS43} * \text{MMLVWS43}}{1 + (\text{MMLVWS43}/\text{MMLVDS43})}$$

where SUPSYS16 is the systolic arm cuff pressure, MMLVWS43 is the left ventricular posterior wall thickness in systole, and MMLVDS43 is the left ventricular internal dimension in systole.

(3) left ventricular mass (grams) (derived from formula of Devereux):
NEWLVM43 =

$$0.80(1.04[(MMVSTD43 + MMLVDD43 + MMLVWD43)^3 - (MMLVDD43)^3]) + 0.6$$

where the MMVSTD43 is the ventricular septal thickness at end-diastole, MMLVDD43 is the left ventricular internal dimension at end-diastole, and MMLVWD43 is the posterior wall thickness at end-diastole.

Two-dimensional measurement methodology. For two-dimensional images of the left ventricle, measurements were made from views in which at least 80% of the endocardium (and epicardium) was visualized well enough to be planimetered. The black-white interface, rather than the leading edge, was used for planimetering the endocardium. For purposes of planimetry, the papillary muscles were included within the left ventricular cavity. Images were selected at end diastole and end systole for computation of left ventricular end-diastolic volume and mass, end-systolic volume, and ejection fraction. The video frame corresponding to end diastole was identified as the frame with the largest visible left ventricular dimension recorded in early diastole by referring to the QRS complex. End-systole was determined by locating the frame demonstrating the smallest visible left ventricular dimension.

Left ventricular volumes at end diastole (EDV) and end systole (ESV) were calculated from the two-dimensional images (parasternal short-axis and apical four-chamber or two-chamber views) using truncated ellipsoid and modified Simpson's rule methods. Left ventricular ejection fraction (LVEF243) was calculated from the following formula:

$$LVEF243 = [(EDV - ESV)/(EDV)] * 100\%$$

Left ventricular mass was estimated using biplane Simpson's rule and truncated ellipsoid methods. Quantitative analyses of left ventricular segmental wall motion were performed automatically from the same planimetered images used to estimate two-dimensional left ventricular volumes, ejection fraction, and mass. The Dextra off-line image analysis system displays percent radial shortening of the left ventricle in 100 radial segments in short-axis and apical views. To simplify data collection and analysis, custom algorithms were written to average these radial shortening measurements, using the center-line method, over the 20 left ventricular wall segments suggested by the American Society of Echocardiography in its myocardial wall segments document. In addition, wall motion scores ("normal," "hypokinesis," "akinesis," and "dyskinesis") were assigned by the readers to each of these 20 segments.

Doppler measurement methodology. For pulsed Doppler measurements of left ventricular outflow tract, pulmonary, and mitral peak flow velocity (and flow velocity) integrals, spectral curves were traced using the peak velocity convention (i.e., the outer edge of the spectral envelope). Measurements were made from beats demonstrating the following characteristics: (1) highest peak velocity, (2) narrowest spectral dispersion, and (3) most normal appearing contour.

Coding and Definitions for Categorical Variables from the Baseline Echo

LVCS43, LACS43, LVEF43, LVSWM43:
(Qualitative assessments: Left ventricular chamber size, Left atrial chamber size, Left ventricular ejection fraction, Left ventricular wall motion)
1=Normal
2=Borderline
3=Abnormal

For qualitative left ventricular chamber size (LVCS43), NORMAL signifies maximal displacement of atrial area by the color flow jet in any view is less than 1/3. MODERATE signifies maximal displacement is 1/3 to ½, and SEVERE means maximal displacement is > ½.

Year 7

A. CODING AND DEFINITONS FOR SELECTED CATEGORICAL VARIABLES FROM THE YEAR 7 ECHO

MR43, AR43, TR43, MAC43, AOAC43, RWMA43, AOTHCK43
0 = CANT ASSESS
1 = NONE
2 = MILD
3 = MODERATE
4 = SEVERE

For Mitral and Tricuspid Regurg (MR43 and TR43), MILD signifies maximal displacement of atrial area by the color flow jet in any view is less than 1/3. MODERATE signifies maximal displacement is 1/3 to 1/2, SEVERE means maximal displacement is > 1/2.

For Aortic Regurg (AR43), MILD means the width of color flow jet in LV outflow tract is less than 1/2 of the LVOT width. MODERATE means the width of the jet is 1/2 to 3/4 LVOT width, SEVERE means the width of the jet > 3/4 LVOT width.

For Qualitative Mitral Annular Calcification (MAC43), MILD signifies focal, limited increased echodensity of mitral annulus, MODERATE signifies marked echodensity involving more than 1/3 of ring, SEVERE signifies marked echodensity involving 1/2 or more of ring, with at least some compression of LV inflow tract.

For Qualitative Aortic Ring Thickening/Calcification (AOAC43), MILD signifies focal, limited increased echodensity of aortic annulus, MODERATE signifies extensive echodensity involving more than 1/2 of ring circumference, but with preserved leaflet mobility, SEVERE indicates extensive echodensity involving entire circumference of aortic ring, with limitation of leaflet excursion.

For Regional Wall Motion Abnormalities (RWMA43), NORMAL means no dyssynchronous LV wall segments, at least 75% of 16 segments available, MILD means hypokinesis of 1/3 or less of evaluable segments, MODERATE means hypokinesis of 1/2 to 2/3 of evaluable segments, or

akinesis/dyskinesis of 1/3 of evaluable segments, SEVERE signifies akinesis/dyskinesis of 1/3 evaluable segments and hypokinesis of additional 1/3 or more.

For Qualitative Aortic Leaflet Thickening (AOTHCK43), MILD means focal, limited increased echodensity of aortic leaflets, MODERATE indicates diffuse of extensive increased echodensity, some thin leaflet echos appreciable, SEVERE signifies diffuse "white out" of aortic valve tissue.

VARIABLE LVFNCT43
0 = CANT ACCESS
1 = NORMAL
2 = MILD DECREASE
3 = MOD DECREASE
4 = SEV DECREASE

For Qualitative LV Function (LVFNCT43), NORMAL signifies that the ejection fraction is estimated equal or more than 55%, MILD signifies ejection fraction equal to 45-54%, MODERATE signifies ejection fraction of 30-45%, and SEVERE indicates an ejection fraction < 30%.

To compare year 7 LV Function (LVFNCT43) and the year 2 LV ejection fraction (LVEF43) use the following equivalents:

LVEF43		LVFNCT43
Normal	=	Normal
Borderline	=	Mild Decrease
Abnormal	=	Moderate or Severe Decrease

AOEXC43
0 = CANT ACCESS
1 = NORMAL
2 = MILD IMP
3 = MODERATE IMP
4 = SEVERE IMP

For Qualitative Aortic Leaflet Excursion (AOEXC43), NORMAL signifies maximal cusp separation 1.5 cm or greater, MILD means cusp separation 1.0 to 1.4 cm, MODERATE indicates cusp separation 0.5 to 0.9 cm, SEVERE signifies cusp separation < 0.5 cm.

B. FORMULAE FOR COMPUTED YEAR 7 ECHO VARIABLES

(1) LV PERCENT FRACTIONAL SHORTENING

$$MMLVFS43 = \frac{MMLVDD43 - MMLVDS43}{MMLVDD43} \times (100\%)$$

(2) LV MASS

$$MMLVMS43 = \{0.80 * 1.04 * [(MMLVDD43 + MMVSTD43 + MMLVWD43)^3 - MMLVDD43^3]\} + 0.6$$

(3) END SYSTOLIC STRESS

$$MMLVSS43 = \frac{0.334 \times SUPSYS16 \times MMLVDS43}{\left(1 + \frac{MMLVWS43}{MMLVDS43}\right) \times MMLVWS43}$$

C. FORMULAE FOR ADJUSTING YEAR 7 VARIABLES TO BASELINE

The Echo lab had done some duplicate reading of records, which were originally considered Quality Control readings but were meant to replace the original readings. The replacement has been done. In addition, for some of the Echo variables, there is an original value and an adjusted value. The adjustment value aligns the Yr 7 readings with the baseline ones for analyses examining change over time or for analyses combining the baseline and Yr 7 echo readings. The adjustment variables are indicated by an "AD" ending and the originals by the record "43" ending in the YR7 file. The adjustment variables are defined as follows:

DPMAPAD = (DPMAP43 + 3.24)/100
DPMEPAD = (DPMEP43 + 2.41)/100
MMARDAD = MMARD43 - 0.097
MMLVDDAD = MMLVDD43 + 0.067
MMLVDSAD = MMLVDS43 + 0.089
MMVSTSAD = MMVSTS43 - 0.112
MMLVFSAD = 100*(MMLVDDAD-MMLVDSAD)/(MMLVDDAD)

Holter (Records 45 & 46)*:

Reference:

- Manolio TA, Furberg CD, Rautaharju PM, Siscovick D, Newman AB, Borhani NO, Gardin JM, Tabatznik B. Cardiac Arrhythmias on 24-hour Ambulatory Electrocardiography in Older Women and Men: The Cardiovascular Health Study. JACC 1994; 23/4:916-925.

During the baseline CHS examination, 24-hour ambulatory ECG monitoring was performed in a randomly selected subset of study participants. The baseline holters were completed halfway through Year 3, and the Year 7 holters (data not included) were completed at the end of Year 8. For the baseline examination, holter ischemia data were recorded in Record 45, and holter rhythm data were recorded in Record 46. For the Year 7 holters, all data were recorded in Record 46; Record 46 was modified to include ischemia summary variables as well as the rhythm data at Year 7.

Ambulatory ECG monitors were applied at the end of the baseline clinical examination, usually between 11:00 a.m. and 1:00 p.m. and were removed the following day. Five electrodes were applied to monitor two bipolar V_1- and V_5-like leads from the right subclavicular space to the V_5 position (lead CV_5) and from the left subclavicular space to the V_1 position (lead CV_1) using a Dynacord model 420 Cassette Holter Recorder (Del Mar Avionics). Recordings were analyzed for the presence of hourly frequency of arrhythmic events and ischemic episodes using Century model 48 hardware and software (Biomedical Systems).

Ectopic beats were identified by creating templates on normally conducted QRS complexes and complexes considered to be ventricular ectopic complexes that were displayed to and classified by an operator whenever there was uncertainty in the computer algorithm. Supraventricular ectopic complexes were those with QRS morphology matching the template of normally conducted complexes and were detected strictly by their prematurity in the cardiac cycle.

Ventricular arrhythmias as a group included ventricular tachycardia ($\geq$3 consecutive complexes) and frequent ventricular ectopic activity ($\geq$15 complexes/hr). Supraventricular arrhythmias included tachyarrhythmias/bradyarrhythmias (heart rate $\leq$40 and $\geq$130 beats/min sustained >12 sec), sustained or intermittent atrial fibrillation or flutter, frequent supraventricular ectopic activity ($\geq$15 complexes/hr), and supraventricular tachycardia ($\geq$3 consecutive complexes). Bradycardia/conduction blocks included Mobitz type II or third-degree atrioventricular (AV) block, pauses >3 sec and bradycardia $\leq$40 beats/min sustained >12 sec.

* For more information regarding the background, rationale, definitions, alerts, Holter equipment and methods, and data collection procedures, please see the appropriate section of the Manual of Operations.

MRI (Record 54):

References:

- Bryan RN, Wells SW, Miller TJ, Elster AD, Jungreis CA, Poirier VC, Lind BK, Manolio TA. Infarctlike Lesions in the Brain: Prevalence and Anatomic Characteristics at MR Imaging of the Elderly - Data from the Cardiovascular Health Study. Radiology 1997; 202/1: 47-54.

- Bryan RN, Manolio RA, Schertz LD, Jungreis C, Poirier VC, Elster AD, Kronmal RA. A Method for Using MR to Evaluate the Effects of Cardiovascular Disease in the Brain: The Cardiovascular Health Study. AJNR 1994; 15:1625-1633.

Cerebral MRIs were completed on 3660 CHS participants (3223 original cohort members and 437 African-American cohort members). A pilot study, consisting of 300 MRIs, was completed in early 1992; these MRIs are included in the 3660 total. The bulk of the MRIs were completed during Year 5 (June 1992 - May 1993), and the remainder were completed during Year 6 (June 1993 - May 1994). The pilot study was designed as a case control study in which the cases were participants who reported a positive history of stroke at baseline. Two controls, matched on age and sex, were included for each case.

MR imaging included a T1-weighted (500/20 [repetition time msec/ echo time msec], one signal acquired), sagittal-localizing sequence with a 5-mm section thickness, no section gap, 24-cm field of view, and 128 x 256 matrix. Midline sagittal images were used to identify the anterior commissure-posterior commissure line along which all oblique axial images were aligned. Spin-echo spin-density weighted (3,000/30, one-half or one signal acquired), spin-echo T2-weighted (3,000/90, one-half or one signal acquired), and T1-weighted (500/20, one or two signals acquired) oblique axial images with a 5-mm section thickness, no intersection gap, 24-cm field of view, and 192 x 256 matrix were acquired from the vertex to the foramen magnum on 1.5-T (GE Medical Systems, Milwaukee, Wis; Picker, Cleveland, Ohio) instruments at three sites or a 0.35-T (Toshiba American Medical Systems, Duluth, Ga) instrument at one site.

The resulting images were displayed simultaneously on four 1,024 x 1,024-pixel workstation monitors for evaluation by trained readers. Each study had a primary and secondary interpretation rendered by a different reader blinded to any information except that the studies were from the CHS. All primary readers were board-certified radiologists with subspecialty neuroradiology fellowship training. The group of secondary readers included the same radiologists plus an experienced neuroimaging technologist. Each reader had completed an MR image-interpretation training course specifically designed for the CHS project and had met specified reader-reproducibility criteria. Interpretations of the images were recorded in a computerized database that included fields for lesion number, location, size, signal intensity, and anatomic location.

Infarctlike lesions were defined as focal, nonmass areas, hyperintense to gray matter on both spin-density-weighted and T2-weighted images. The intensity of the lesions on T1-weighted images relative to normal gray matter was recorded. To be considered an infarctlike lesion in cerebral white matter and the brain stem, lesions were required to be hypointense on T1-weighted images, with

intensities that approximated that of cerebrospinal fluid.

Nonhemorrhagic infarcts involving cortical gray matter had to be bright on spin density- and T2-weighted images relative to normal gray matter. They could be hypointense or isointense on T1-weighted images. Similarly, nonhemorrhagic infarcts involving the deep nuclear region had to be bright on spin density-weighted images and bright on T2-weighted images. They also could have been isointense or dark on T1-weighted images. The requirement for hyperintensity or spin density-weighted images was intended to distinguish small deep nuclear region infarcts from dilated perivascular spaces. For the purposes of this study, the deep nuclear region was defined to include the caudate nucleus, lentiform nucleus, internal capsule, external capsule, extreme capsule, and thalamus.

Nonhemorrhagic infarcts in the white matter likewise had to be bright on spin density-weighted images and bright on T2-weighted images, but they also had to be dark on T1-weighted images, approaching the T1 hypointensity of cerebrospinal fluid. This T1 hypointensity requirement was intended to distinguish actual white matter infarction from the more prevalent, nonnecrotic, white matter disease.

Any hemorrhagic nonmass lesion in a vascular distribution was recorded as an infarct with hemorrhage. Signal criteria included heterogeneously increased signal on T1-weighted images and heterogeneously decreased signal on T2-weighted images.

The dimensions of the lesions were carefully measured by using an electronic cursor with images magnified three times to approximately 5 x 5 cm. The maximum right-to-left and anteroposterior dimensions of each lesion were recorded. The superoinferior dimension was reported according to the number of axial sections on which the lesion appeared. The maximum right-to-left or anteroposterior dimension of a lesion was used for analysis of lesion size. Lesions with a greatest dimension less than 3 mm could not be measured accurately owing to pixel resolution and were recorded as less than 3 mm.

For anatomic location, lesions were assigned to one or more of 23 anatomic regions defined by gross anatomic and vascular characteristics. The primary anatomic region occupied by the lesion was used for analysis.

A summary of variable names and descriptive statistics for the most commonly used MRI variables appears below. The MRI data are located in the MRRECS database.

MRI VARIABLES

1. Graded variables
    - Ventricles (VENT54)
    - Sulci (SULCI54)
    - White Matter Grade (WHGRD54)

These variables are measures of atrophy and were scored with a value of 0-9. For Ventricles and Sulci, 0 = smallest and 9 = largest, and for White Matter Grade, 0 = no changes and 9 = most pronounced changes. The scores were based on a set of reference pictures which the readers used during the reading; image interpretation was based on "pattern matching" of individual subject scans to a library of 40 example studies retained at the MR Imaging Reading Center.

2. Measured variables

Bifrontal distance (cm) (BIDIST54)
Inner table distance (cm) (ITDIST54)
Central sulcus width (cm) (CNTSUL54)

These are continuous variables containing: size measurements for the distance between the frontal horns (bifrontal distance); the largest right-left diameter from the inner table of the skull; and the largest perpendicular diameter of the right central sulcus in the axial projection.

3. White matter variables

White matter location (WHPLOC54): codes are
1=PV > SC (periventricular > subcortical)
2=PV = SC
3=PV < SC

White matter symmetry (WHSYM54):codes are
1= right = left
2=right > left
3=right < left

Brain stem lesions (WHBRST54): codes are
1=none
2=minimal
3=moderate, severe

4. Small infarcts (< 3mm)

Specific information on the size and location of small infarcts was not obtained. The only information that is available is the presence or absence of any small infarcts, and the presence/absence and side of small infarcts in three areas of the brain: basal ganglia, white matter, and brain stem.

Small infarcts present? (SMLINF54)	1=yes; 2=no
Number of small basal ganglia infarcts:(BGNUM54)	1=1-2, 2= > 2
Side of small basal ganglia infarcts: (BGSIDE54)	1=right; 2=left; 3=both
T1 small basal ganglia infarcts: (BGTI54)	1=yes; 2=no

Number of small white matter infarcts:(WMNUM54)	1=1-2; 2= > 2
Side of small white matter infarcts: (WMSIDE54)	1=right; 2=left; 3=both
Number of small brain stem infarcts: (BSNUM54)	1=1-2; 2= >2
Side of small brain stem infarcts: (BSSIDE54)	1=right; 2=left; 3=both

5. Large infarcts (≥ 3mm)

Any lesion with a maximum diameter of at least 3 mm is considered a large infarct. Up to five large infarcts can be described for each participant, and each of these infarcts can have up to 4 locations. For each infarct there is a set of variables, listed below. The size of the infarct is measured in 3 dimensions: right-left, anterior-posterior, and the number of slices. The size used for analysis is generally the maximum of the right-left and the anterior-posterior dimensions.

Large infarct #1 present? (LINF154)	1=yes; 0=no
Large infarct # 1:	
side (ISIDE154)	1=right; 2=left; 3=both
right/left measurement (ISZRL154)	0.3 to 9.9 cm
anterior/posterior measurement (ISZAP154)	0.3 to 9.9 cm
Number of slices (IZ154)	1 to 15
T1 signal (IMRT1154)	1=increased; 2=isointense; 3=decreased
PD signal (IMRPD154)	1=increased; 2=isointense; 3=decreased
T2 signal (IMRT2154)	1=increased; 2=isointense; 3=decreased
Hemorrhagic? (IHEM154)	1=yes; 0=no
Location #1 (ILOC1154)	1= ACA: frontal; 2= ACA: parietal 3= MCA: frontal 4= MCA: parietal 5= MCA: temporal 6= PCA: parietal 7= PCA: temporal 8= PCA: occipital 9= supCerebellarA 10= AICA 11= PICA 12= deep cerebellar white matter 13= caudate 14= lentiform nuclei 15= interior capsule anterior limb 16= interior capsule posterior limb 17= thalamus 18= midbrain 19= pons 20= medulla

21= Watershed ACA:MCA
22= Watershed MCA:PCA
23= deep cerebral white matter

Location # 2 (same codes as above)
Location # 3 (same codes as above)
Location # 4 (same codes as above)

Note that not every infarct appears in 4 distinct locations. If a location variable is missing for a particular infarct, that indicates fewer than 4 locations for that infarct.

Large Infarct # 2	(same variables as above)
Large Infarct # 3	(same variables as above)
Large Infarct # 4	(same variables as above)
Large Infarct # 5	(same variables as above)

The 23 locations listed above can be grouped as follows:

1-8 cerebro-cortical
9-11 cerebellar-cortical
12 deep cerebellum
13-17 Deep cerebrum (or Basal Ganglia)
18-20 Brain stem
21-23 Deep cerebral white matter

6. Hematomas

As with large infarcts, there is a set of variables describing each hematoma, and up to three hematomas can be described. Each of these hematomas can have up to 4 locations.

Hematoma #1 present? (HEM154)	1=yes; 0=no
Hematoma # 1:	
side (HSIDE154)	1=right; 2=left; 3=both
right/left measurement (HSZRL154)	0.3 to 9.9 cm
anterior/posterior measurement (HSZAP154)	0.3 to 9.9 cm
Number of slices (HZ154)	1 to 15
T1 signal (HMRT1154)	1=increased; 2=isointense; 3=decreased
PD signal (HMRPD154)	1=increased; 2=isointense; 3=decreased
T2 signal (HMRT2154)	1=increased; 2=isointense; 3=decreased
age (HAGE154)	1=acute; 2=subacute; 3=chronic
Location #1 (HLOC1154)	1= ACA: frontal; 2= ACA: parietal 3= MCA: frontal 4= MCA: parietal

5= MCA: temporal
6= PCA: parietal
7= PCA: temporal
8= PCA: occipital
9= supCerebellarA
10= AICA
11= PICA
12= deep cerebellar white matter
13= caudate
14= lentiform nuclei
15= interior capsule anterior limb
16= interior capsule posterior limb
17= thalamus
18= midbrain
19= pons
20= medulla
21= Watershed ACA:MCA
22= Watershed MCA:PCA
23= deep cerebral white matter

Location # 2 (same codes as above)
Location # 3 (same codes as above)
Location # 4 (same codes as above)

Note that not every hematoma appears in 4 distinct locations. If a location variable is missing for a particular hematoma, that indicates fewer than 4 locations for that hematoma.

Hematoma # 2 (same variables as above)
Hematoma # 3 (same variables as above)

7. Focal brain atrophy

Focal brain atrophy: (FOCAL54) 1=yes; 0=no

Each location is a separate variable, coded as 1=right, 2=left, or 3=both:
Cerebrum atrophy variables:

ACA: frontal (ACAF54)
ACA: parietal (ACAP54)
MCA: frontal (MCAF54)
MCA: parietal (MCAP54)
MCA: temporal (MCAT54)
PCA: parietal (PCAP54)
PCA: temporal (PCAT54)

PCA: occipital (PCAO54)

Cerebellum atrophy variables:

SupCerebellarA (SCA54)
AICA (AICA54)
PICA (PICA54)

Deep matter atrophy variables:

Deep cerebellar white matter (CBLWM54)
Caudate (CAUD54)

Watershed atrophy variables:

Watershed ACA:MCA (ACAMCA54)
Watershed MCA:PCA (MCAPCA54)

8. Other variables

Perivascular spaces: (PERSIP54)
1=codes are normal; 2=mild increase; 3=marked increase

Other diagnoses:(OTHDIA54)
1=none
2=congenital
3=inflammatory
4=neoplasm
5=hydrocephalus
6=hemorrhage
7=vascular
8=other

Parenchymal hematoma: (PARHEM54) 1=yes, 2=no

Completion status: (COMPLETE)
0= Not recruited, reason unknown
1= MRI done, data
2= MRI done, no data
3= ineligible
4= no show
5= previous MRI
6= unable
7= refused
8= scanner unavailable
9= unknown reason
10=deceased
11=no clinic visit

Nutrition Data (Record 65):

The Dietary Assessment Form collects food frequency information which is converted into the nutrient variables that follow. The raw dietary information is not included. For more information see the Food Frequency Questionnaire in Forms and Method of Operations Record 65.

Calories (Kcal):	CAL65
Protein (gm):	PROT65
Animal Fat (gm):	AFAT65
Vegetable Fat (gm):	VFAT65
Carbohydrates (gm):	CARBO65
Crude Fiber (gm):	CRUDE65
Diet Fiber (gm):	DTFIB65
Aoac Fiber (gm):	AOFIB65
Calcium (mg):	CALC65
Iron (mg):	IRON65
Magnesium (mg):	MAGN65
Phosphorous (mg):	PHOS65
Potassium (mg):	K65
Zinc (mg):	ZINC65
Vitamin C (mg):	VITC65
Vitamin B1 (mg):	VITB165
Vitamin B2 (mg):	VITB265
Niacin (mg):	NIACIN65
Vitamin B6 (mg):	VITB665
Folate (mcg):	FOL65
Retinol (IU):	RETIN65
Carotene (IU):	CAROT65
Vitamin A (IU):	VITA65
Saturated Fat (gm):	SATFAT65
Monounsaturated Fat(gm):	MONFAT65
Oleic (gm):	OLEIC65
Polyunsaturated Fat(gm):	POLY65
Linoleic (gm):	LINOL65
Cholesterol (mg):	CHOL65
Methionine (gm):	METH65
Vitamin D (IU):	VITD65
Vitamin E (IU):	VITEIU65
Vitamin E (mg):	VITE65
Alcohol (gm):	ALCO65
Caffeine (mg):	CAFF65
Saccharin (mg):	SACH65
Vitamin B12 (mcg):	VITB1265
Pantothenic Acid (mg):	PANTO65
Sucrose (gm):	SUCR65

Sodium (mg): SODIUM65
Animal Protein (gm): APROT65
Lactose (gm): LACT65
Tryptophan (gm): TRYPT65
Manganese (mg): MN65
Omega3 W20.5+W22.6 (gm):OMEGA65
Iodine (mcg): IODINE65
Selenium (mcg): SE65
Copper (mg): CU65
Fructose (gm): FRUCT65
18.3 Fatty Acid (gm): F18365
4.0 Fatty Acid (gm): F4065
6.0 Fatty Acid (gm): F6065
8.0 Fatty Acid (gm): F8065
10.0 Fatty Acid (gm): F10065
12.0 Fatty Acid (gm): F12065
14.0 Fatty Acid (gm): F14065
16.0 Fatty Acid (gm): F16065
18.0 Fatty Acid (gm): F18065
16.1 Fatty Acid (gm): F16165
20.1 Fatty Acid (gm): F20165
22.1 Fatty Acid (gm): F22165
18.4 Fatty Acid (gm): F18465
20.4 Fatty Acid (gm): F20465
20.5 Fatty Acid (gm): F20565
22.5 Fatty Acid (gm): F22565
22.6 Fatty Acid (gm): F22665
Glutamate (gm): GLUT65
Asparate (gm): ASP65
Calcium Without Vitamin Pills (mg):CALCWO65
Iron Without Vitamin Pills (mg): IRONWO65
Zinc Without Vitamin Pills (mg): ZNWO65
Vitamin C Without Vitamin Pills (mg): VTCWO65
Thiamine B1 Without Vitamin Pills (mg): VTB1WO65
Riboflavin B2 Without Vitamin Pills (mg): VTB2WO65
Pyridoxine B7 Without Vitamin Pills (mg): VTB6WO65
Folate Without Vitamin Pills (mcg): FOLWO65
Retinol Without Vitamin Pills (IU): RETWO65
Vitamin A Without Vitamin Pills (IU): VTAWO65
Vitamin D Without Vitamin Pills (IU): VTDWO65
Vitamin E Without Vitamin Pills (IU): VEIUWO65
Vitamin E Without Vitamin Pills (mg): VTEWO65
Vitamin B12 Without Vitamin Pills (mcg): VB12WO65
Selenium Without Vitamin Pills (mcg): SEWO65

Fat Eaten (gm):	FATEAT65
Calories From Fat (Kcal):	CALFAT65
Number Of Unanswered Foods:	NBLANK65

Spot Urine Data (Record 72)

Urine samples will be analyzed by the CHS central blood laboratory. Samples will be thawed, centrifuged, and tested by dip-stick for blood, protein, glucose, and leukocytes. A small volume will be aliquoted for albumin testing (micro albuminuria). The remaining volume will be adjusted to a pH of 7.0, aliquoted into 10 mL volumes, and frozen for repository.

The spot urine data are as follows:

Microalubumen (mg/g creatinine)	UAB72
Micoalbument (mg/dL)	UALB72
Creatinine (mg/dL)	UCRR72
Leukocytes	LEUK72
pH Level	PH72
Protein	PROT72
Glucose	GLUC72
Ketones	KET72
Blood72	BLOOD72

Retinal Data (Record 77)

Photographs were evaluated at the Fundus Photograph Reading Center in Madison, Wisconsin. They were graded for quality of the images, then viewed with an 8-power lens by a grader, masked to subject information, for signs of ARM, retinopathy, focal and generalized retinal arteriolar narrowing, and arteriovenous (A/V) nicking. In addition, quantitative assessments of the diameters of retinal vessels were made after conversion of the fundus photographs to digital images using a high-resolution scanner. Measurements were made of diameters of all arterioles and venules in the area located between 0.5 and 1 disc diameter from the margin of the optic disc.

The retinal data are as follows:

Eye Photographed	EYE277
Photogragh	PHOTOG77
Pupillary Dilation in millimeters	PUPIL77
Gradability	GRADAB77
Diabetic Retinal Level	DRLVL77
Central retinal arteriolar equivalent, trunk	CRAET77
Central retinal arteriolar equivalent, branch	CRAEB77
Central retinal venous equivalent	CRVE77
AV Ratio, trunk (CRAET/CRVE)	AVRATT77
AV Ratio, branch (CRAEB/CRVE)	AVRATB77