A. Collection Information:

Beginning in March 1996, a magnetic resonance angiography (MRA) study was to be completed at the time of each magnetic resonance imaging (MRI) study (See Section 2.1).

Form MRA (**MRA Form**) was used to collect the data. Section A of the form was completed by the radiology technician/technologist at the local institution. Section B was completed by the Data Coordinator at the local institution. Section C was completed by the Data Manager at the SCC; and Section D was completed by the Data Manager at the SCC based on consensus reading results of two members of the CSSCD MR Reading Panel.   The CSSCD MR Reading Panel included three neuroradiologists who met 2-4 times each year between 1990 and 1999 in either Philadelphia or New York to perform batch reviews/readings of CSSCD MRI/MRA studies.

MRA Protocol:

MR angiograms should be obtained using 3D time-of-flight techniques. MRA data acquisition and image display protocol requirements are described below.

A. Image Acquisition

1. Anatomic coverage:

   a. An axial (transverse) plane of acquisition should be used.
   b. The study must include the juxtasellar and supraclinoid internal carotid arteries and the horizontal portion of the middle cerebral arteries in the Sylvian cistern. This can usually be achieved by centering the slab on the supraclinoid ICA.

2. Echo time (TE): The TE should be minimized ($\leq$ 5 msec if possible). This reduces intravoxel phase dispersion and resultant loss of flow related signal. Loss of flow related signal can mimic or exaggerate vascular stenoses, and is particularly problematic in patients with SCD due to their increased flow rates.

3. Spatial resolution: Use of the smallest feasible voxel size (small FOV 15-20 cm, 256-512 matrix) and shortest obtainable echo time (TE) minimize flow-related loss of intravascular signal. Unfortunately, when one attempts to use a small FOV or increase the read matrix, the minimum obtainable TE usually increases. While both are important, minimizing TE should take priority over voxel size considerations.

   a. The highest reasonable resolution should be used. A matrix of 256 x 256 is acceptable. Higher resolution matrices (256 x 512) are preferable as long as TE is not prolonged > 5 msec.

b. The minimum feasible field of view should be used, optimally in the 15-20 cm range. A rectangular field of view can be used, if available, to reduce scan time or increase resolution.

c. At least 60 partitions, $\leq$ 1 mm thick should be acquired.

4. Other parameters:

a. The flip angle is system and parameter specific and should be optimized on each imaging system.

b. Variable flip angle techniques (a.k.a. TONE, ramped-RF) may be used if available, provided there is no significant TE penalty on the system.

c. A presaturation pulse may be used cephalad to the slab to eliminate visualization of venous structures.

d. Where available, magnetization transfer preparation may be used, understanding that MTC usually increases the minimum TR.

B. Image Display for Filming

1. All partitions (source images) should be photographed in sequence. They may be made small, but should be large enough so that vascular anatomy can be worked out when the maximum intensity projections (MIP) leave questions. A 24 on 1 format is recommended as the maximum for a 14 x 17 sheet of film.

2. MIP images should be generated and filmed as follows:

a. **Sites that cannot perform targeted (segmented) MIPs:** An axial collapsed image followed by unsegmented MIP images rotated from the left lateral projection, through the AP, to the right lateral projection in 15 degree increments.

b. **Sites that can perform targeted (segmented) MIPs:** The anterior and posterior circulations should be separately MIP'ed and projected. Each should be rotated from the left lateral, through the AP, to right lateral projection in 30 degree increments.

c. **All sites:** Unsegmented paraxial images should be filmed starting with the right side down (remember you are "looking up at the vessels from below"), then rotated through the **axial collapsed projection**, ending with the left side down. The images should be filmed in roughly 10- degree increments. These images are designed to eliminate superimposition of MCA branches in the axial plane.

d. The vessels should be displayed as white on a black background. Please adjust the window and level of the images so that the details of the vessel walls will be apparent.

In general, compliance with this compliance was poor. Approximately 50% of studies performed were unacceptable for reading, primarily due to acquisition problems or failure to provide the requested images. Echo time exceeded 5.1 msec on more that 40% of the rejected studies.

B. Data Collection Period: 03/96 – 09/98
Five studies were performed after 09/30/98.

C. Form Versions: C (05/01/96) - Phase 3
D (04/01/97) – Phase 3

D. Files Used to Store Information:
SAS System File: **MRA_PUBN.SD2**
Format File: **MRAN.FMT**

E. Unique Record Identifiers: **ANONID**, **MRAID2**
Records within the dataset are sorted by **ANONID** and **MRAID2**.

F. Number of Observations (Patients) in SAS Dataset: 277 (251)
Two hundred twenty-six patients had one MRA study; 24 had two, and one had three. Note that 23 of the 277 studies were not reviewed by the MR Reading Panel at the time of a central reading meeting of the Panel. Based on previous quality reviews of these studies by the Panel, 15 were determined to be unreadable. The other 8 were not available for reading at the time of the last meeting of the MR Reading Panel.

G. Contents of SAS Dataset:
- Alphabetical Listing of Variables: See pp. 7-9
- Listing of Variables by Position: See pp. 10-11

H. Notes About Selected Variables:
- **MRAID2** – is the variable name for the follow-up code number identifier which, with **ANONID**, can be used to link with the corresponding follow-up identifier in the MRI (**MRIID2** in **MRI_PUBN.SD2**) dataset (See Section 2.1) or neuropsychological (**NPCID2** in **NPC_PUBN.SD2**) dataset (See Section 2.3).

I. <u>Computed Variables</u>: None

J. <u>Inter-Relationship With Other Datasets</u>:

- MRI data collected at the same time as the MRA data were collected on

Form Abbreviation	SAS Dataset	See Section
MR3	**MRI_PUBN.SD2**	2.1

- Neuropsychological evaluation data which were to be collected within six weeks of

  MRI/MRA studies were collected on

Form Abbreviation	SAS Dataset	See Section
NPC	**NPC_PUBN.SD2**	2.3
ACC	**ACC_PUBN.SD2**	2.4
NPP	**NPP_PUBN.SD2**	2.5
PVTQ	**PVTQPUBN.SD2**	2.6
FES	**FES_PUBN.SD2**	2.7
ACBC	**ACBCPUBN.SD2**	2.8

CSSCD Phase 3
2.2: MRA Form – Form MRA

SECTION A

TO BE COMPLETED BY RADIOLOGY TECHNICIAN

A1.   Person completing form (Name):   **MRAFC**   (Initials): [ ][ ][ ]
_____

A2.   Date of procedure (Month/Day/Year):   **MRADATE**
_____/_____/_____

A3.   Department film/Scan ID number: **SCAN_ID**   [   ]

A3.1 Is the patient's MRA data available on tape or optical disk?   **ON_TAPE**   [ ] 1. NO   [ ] 2. YES

A4.   Are the MRA films adequate for interpretation?   **ADEQUATE**   [ ] 1. NO   [ ] 2.YES
↓

A4.a. Reason: **INADREAS**

[ ] 1. Incomplete Study   [ ] 2. Motion Artifact   [ ] 3. Other →   A4.b. Specify: _____ **REAS_SP** _____

RESCHEDULE STUDY WITHIN TWO WEEKS

A5.   Name of Imaging Center: **IMG_CTRL**

A6.   Machine/Model: **MACHINE**

A7.   Echo Time (ms):   **ECHOTIME**   [ ] . [ ]

A8.   Matrix: **MATRIX1**   **MATRIX2**
[ ][ ][ ]   X   [ ][ ][ ]

A9.   Field-of-View (range: 6 - 20 cm):   **FLDVIEW1** [ ]   **(IF SQUARE)**

[ ]   X   [ ]   **(IF RECTANGULAR)**
FLDVIEWA   **FLDVIEWB**

SECTION B

TO BE COMPLETED BY THE DATA COORDINATOR

B1. Date films sent to Statistical Coordinating Center (SCC) (Month/Day/Year):   **DTE_FILM**
_____/_____/_____

SECTION C

TO BE COMPLETED TO BE COMPLETED AT THE SCC

C1.   Is this MRA scan being compared to a previous scan?   ☐ 1. NO   ☐ 2. YES   **COMPPREV**
↓

> Which Scan(s)?
>
> **BASE_DTE**
> C1.a. Baseline scan dated   _____/_____/_____
>
> **PREV_DTE**
> C1.b. Previous scan dated   _____/_____/_____

C2.   Institutional Report: ☐ 1. Not Received   ☐ 2. Received   **IREP_REC**

SECTIONS D – F

TO BE COMPLETED BY READERS

D1. READERS: A. (Name):   (Initials): ☐☐   ~~READER1~~
_____

         B. (Name):   (Initials): ☐☐   ~~READER2~~
_____

D2. Date read (Month/Day/Year):   **DTE_READ**
_____/_____/_____

D3. Study: **ACCEPTED**   ☐ 1. ACCEPTED   ☐ 2.REJECTED
↓

> D3.a. Reason:
>
> ☐ 1. Incomplete Study   ☐ 2. Motion Artifact   ☐ 3. Other → D3.b. Specify: _____**REJ_REAS**_____

D4. **SCAN QUALITY** (CHECK ONE):   **SCANQUAL**   ☐ 1. Excellent

☐ 2. Slight Artifact/Motion, Adequate

☐ 3. Severe Artifact/Motion, Inadequate

D.5 **IMAGES AVAILABLE FOR REVIEW:**

	1. NO	2. YES	
A. Source Images	☐	☐	**SOURCE**
B. Targetd MIP Images	☐	☐	**TARGETED**
C. Unsegmented Paraxial Images	☐	☐	**UNSEGPAR**

E. CENTRAL REVIEW INTERPRETATION   (COMPLETE TABLE FOR MRA USING THE CODES BELOW)

a. RATING	b. STATUS

1 = NORMAL	A = IMPROVED
2 = STENOSIS, MILD	B = SAME (NO PROGRESSION)
3 = STENOSIS, MODERATE	C = WORSE (PROGRESSION)
4 = STENOSIS, SEVERE	D = CANNOT DETERMINE
5 = OCCLUSION	E = N/A
6 = NOT ASSESSABLE	
7 = DEPHASING ARTIFACT, LIKELY NORMAL	

STATUS COMPARED TO

		RATING		Baseline Study	Previous Study	
E1.	RIGHT ICA	a. ☐	**RICA_A**	b1. ☐	b2. ☐	**RICA_B1**
E2.	RIGHT MCA	a. ☐	**RMCA_A**	b1. ☐	b2. ☐	**RMCA_B1**
E3.	RIGHT ACA	a. ☐	**RACA_A**	b1. ☐	b2. ☐	**RACA_B1**
E4.	RIGHT PCA	a. ☐	**RPCA_A**	b1. ☐	b2. ☐	**RPCA_B1**
E5.	LEFT ICA	a. ☐	**LICA_A**	b1. ☐	b2. ☐	**LICA_B1**
E6.	LEFT MCA	a. ☐	**LMCA_A**	b1. ☐	b2. ☐	**LMCA_B1**
E7.	LEFT ACA	a. ☐	**LACA_A**	b1. ☐	b2. ☐	**LACA_B1**
E8.	LEFT PCA	a. ☐	**LPCA_A**	b1. ☐	b2. ☐	**LPCA_B1**
E9.	BASILAR	a. ☐	**BASILRA**	b1. ☐	b2. ☐	**BASILRB1**

		1.NORMAL	2.SMALL	3.NOT VISUALIZED			
E10a.	RIGHT PCoA	☐	☐	☐ **RPCOA_A**	b1. ☐	b2. ☐	**RPCOA_B1**
E11a.	LEFT PCoA	☐	☐	☐ **LPCOA_A**	b1. ☐	b2. ☐	**LPCOA_B1**

		1.GOOD	2.POOR	3.INDETERMINATE			
E12a.	Robustness of Right Hemisphere blood flow	☐	☐	☐ **RHBLD_A**	b1. ☐	b2. ☐	**RHBLD_B1**
E13a.	Robustness of Left Hemisphere blood flow	☐	☐	☐ **LHBLD_A**	b1. ☐	b2. ☐	**LHBLD_B**

F. COMMENTS: **COMMENTS**

COMM_TXT

QUESTION-BY-QUESTION SPECIFICATIONS FOR THE MRA FORM

Only sections A and B will be completed by clinic/local MR personnel. Section A is to be completed by the radiology technician/technologist who performs the MRA test. Section B is to be completed by the Data Coordinator. The remainder of the form will be completed by SCC staff or the central reading panel.

Question AI. Person completing form: The radiology technician/technologist completing the form should enter his/her name on the line and initials in the three boxes to the right of the line.

Question A2. Date of procedure: The date the MRI was done should be entered in the MM/DD/YY date format (e.g., October 24, 1994 would be entered as 10/24/94).

Question A3. Department film/Scan ID number: The radiology technician/technologist should enter the department ID number of the MRI films.

Question A3.I Is the patient's MRA film/scan data available on tape? The radiology technician/technologist should place a check mark in the appropriate response box (1. NO or 2. YES).

Question A4. Are the MRA films adequate for interpretation? The radiology technician/technologist should place a check mark in the appropriate response box (1. NO or 2. YES). If the response is 1. NO, a reason the films are inadequate should be checked (Question A4.a -1. Incomplete Study, 2. Motion Artifact, 3. Other. If the reason is 3. Other, the reason should be specified in the space provided (Question A4.b).

Question A5. Name of Imaging Center. The radiology technician/technologist should print the name of the Imaging Center where the study was performed.

Question A6. Machine/Model. The radiology technician/technologist should print the name of the machine make and model.

Question A7. Echo Time. The radiology technician/technologist should record the echo time

(TE). The echo time should be ≤ 5 msec if possible.

Question A8. Spatial Resolution. The radiology technician/technologist should record the spacial resolution matrix. A matrix of 256 x 256 is acceptable. Higher resolution matrices (256 x 512) are preferable as long as TE is not prolonged > 5 msec.

Question A9. Field of View. The radiology technician/technologist should record the field of view (FOV) used in the appropriate (square or rectangular) box(es). Optimally, the FOV should be in the 15-20 cm range.

Question BI. Date films sent to Statistical Coordinating Center: The Data Coordinator should enter the date that (s)he sent the form, films and institutional report to the SCC. The date should be entered in the MM/DD/YY date format (e.g., October 24, 1994 would be entered as 10/24/94).

Section C will be completed at the SCC.

Section D will be completed by the Central Review Pane

CONTENTS OF SAS DATASET: MRA_PUN.SD2
DATA FROM CSSCD FORM MRA - CODEBOOK CHECKLIST
VARIABLES ARE LISTED IN ALPHABETICAL ORDER AND IN ORDER OF THEIR POSITION
IN THE SAS DATASET AND ON FORM MRA
DATE VARIABLES HAVE BEEN REMOVED & CSSCD ID #S REPLACED W/ ANONYMIZED ID #

The SAS System   11:21 Tuesday, February 10, 2004   1

The CONTENTS Procedure

Data Set Name: IN.MRA_PUN   Observations: 277
Member Type: DATA   Variables: 53
Engine: V6   Indexes: 0
Created: 11:25 Tuesday, February 10, 2004 Observation Length: 502
Last Modified: 11:25 Tuesday, February 10, 2004 Deleted Observations: 0
Protection: Compressed: NO
Data Set Type: Sorted: NO
Label:

-----Engine/Host Dependent Information-----
Data Set Page Size: 16384
Number of Data Set Pages: 10
First Data Page: 1
Max Obs per Page: 32
Obs in First Data Page: 18
Number of Data Set Repairs: 0
File Name: mra_pun.sd2
Release Created: 6.08.00
Host Created: WIN

-----Alphabetic List of Variables and Attributes-----

#	Variable	Type	Len	Pos	Format	Informat	Label
18	ACCEPTED	Num	8	167	2.	2.	D3 STUDY ACCEPTED
4	ADEQUATE	Num	8	31	2.	2.	A4 MRA FILMS ADEQUATE FOR INTERPRET
1	ANONID	Char	8	0			ANONYMIZED ID #
40	BASILRA	Num	8	295	2.	2.	E9A BASILAR - RATING
41	BASILRB1	Char	2	303			E9B1 BASILAR - COMP STATUS TO BASELN
50	COMMENTS	Num	8	345	2.	2.	COMMENTS
51	COMM_TXT	Char	60	353			COMMENTS
14	COMPPREV	Num	8	145	2.	2.	C1 IS IT COMPARED TO PREVIOUS SCAN
8	ECHOTIME	Num	8	97	4.1	4.1	A7 ECHO TIME (ms)
11	FLDVIEW1	Num	8	121	2.	2.	A9A FIELD OF VIEW (cm)
12	FLDVIEWA	Num	8	129	2.	2.	A9B1 FIELD OF VIEW (cm) - RECT, 1st DIM
13	FLDVIEWB	Num	8	137	2.	2.	A9B2 FIELD OF VIEW (cm) - RECT, 2nd DIM
5	INADREAS	Num	8	39	2.	2.	A4A REASON MRA FILMS INADEQUATE
15	IREP_REC	Num	8	153	2.	2.	C2 INSTITUTIONAL REPORT RECEIVED
36	LACA_A	Num	8	275	2.	2.	E7A LEFT ACA - RATING
37	LACA_B1	Char	2	283			E7B1 LEFT ACA - COMP STATUS TO BASELN
48	LHBLD_A	Num	8	335	2.	2.	E13A ROBUSTNESS LFT HEMISPHERE BLD FLOW
49	LHBLD_B1	Char	2	343			E13B1 LFT HEM BLD FLOW - STATUS TO BASE
32	LICA_A	Num	8	255	2.	2.	E5A LEFT ICA - RATING
33	LICA_B1	Char	2	263			E5B1 LEFT ICA - COMP STATUS TO BASELN
34	LMCA_A	Num	8	265	2.	2.	E6A LEFT MCA - RATING
35	LMCA_B1	Char	2	273			E6B1 LEFT ACA - COMP STATUS TO BASELN
38	LPCA_A	Num	8	285	2.	2.	E8A LEFT PCA - RATING
39	LPCA_B1	Char	2	293			E8B1 LEFT PCA - COMP STATUS TO BASELN

44	LPCOA_A	Num	8	315	2.	2.	E11A LEFT PCoA - RATING
45	LPCOA_B1	Char	2	323			E11B1 LEFT PCoA - COMP STATUS TO BASELN
7	MACHINE	Char	30	67			A6 MACHINE/MODEL
9	MATRIX1	Num	8	105	3.	3.	A8A MATRIX (1st dim)
10	MATRIX2	Num	8	113	3.	3.	A8B MATRIX (2nd dim)

The SAS System   11:21 Tuesday, February 10, 2004   2

The CONTENTS Procedure

-----Alphabetic List of Variables and Attributes-----

#	Variable	Type	Len	Pos	Format	Informat	Label
53	MRAID2	Num	8	478			FOLLOW-UP IDENTIFIER
3	ON_TAPE	Num	8	23	2.	2.	A31 MRA DATA AVAILABLE ON TAPE/OP-DISK
28	RACA_A	Num	8	235	2.	2.	E3A RIGHT ACA - RATING
29	RACA_B1	Char	2	243			E3B1 RIGHT ACA - COMP STATUS TO BASELN
54	REASINC	Num	8	486			REASON INCOMPLETE 1
55	REASINC2	Num	8	494			REASON INCOMPLETE 2
6	REAS_SP	Char	20	47			A4B SPECIFY REASON INADEQUATE
19	REJ_REAS	Num	8	175	2.	2.	D3A REASON NOT ACCEPTED
52	REJ_TEXT	Char	65	413			D3B SPECIFY OTHER REASON NOT ACCEPTED
46	RHBLD_A	Num	8	325	2.	2.	E12A ROBUSTNESS RT HEMISPHERE BLD FLOW
47	RHBLD_B1	Char	2	333			E12B1 RT HEM BLD FLOW - STATUS TO BASELN
24	RICA_A	Num	8	215	2.	2.	E1A RIGHT ICA - RATING
25	RICA_B1	Char	2	223			E1B1 RIGHT ICA - COMP STATUS TO BASELN
26	RMCA_A	Num	8	225	2.	2.	E2A RIGHT MCA - RATING
27	RMCA_B1	Char	2	233			E2B1 RIGHT MCA - COMP STATUS TO BASELN
30	RPCA_A	Num	8	245	2.	2.	E4A RIGHT PCA - RATING
31	RPCA_B1	Char	2	253			E4B1 RIGHT PCA - COMP STATUS TO BASELN
42	RPCOA_A	Num	8	305	2.	2.	E10A RIGHT PCoA - RATING
43	RPCOA_B1	Char	2	313			E10B1 RIGHT PCoA - COMP STATUS TO BASELN
20	SCANQUAL	Num	8	183	2.	2.	D4 SCAN QUALITY
2	SCAN_ID	Char	15	8			A3 DEPARTMENT FILM/SCAN ID NUMBER
21	SOURCE	Num	8	191	2.	2.	D5A SOURCE AVAIL FOR REVIEW
22	TARGETED	Num	8	199	2.	2.	D5B TARGETED AVAIL FOR REVIEW
23	UNSEGPAR	Num	8	207	2.	2.	D5C UNSEGMENTED PARAX AVAIL FOR REVIEW

```
*******************************************************************************
* MRA.FMT contains value labels for numerical codes assigned to categorical *
* variables in the SAS dataset MRA_PUN.SD2                                   *
*******************************************************************************;


PROC FORMAT;

* FORMAT NO_YES IS DEFINED FOR VARIABLES: ON_TAPE ADEQUATE COMPPREV IREP_REC
  SOURCE TARGETED UNSEGPAR COMMENTS;

VALUE NO_YES
               1='NO'
               2='YES';




* FORMAT REASON IS DEFINED FOR VARIABLES: INADREAS REJ_REAS;

VALUE REASON
               1='INCOMPLETE STUDY'
               2='MOTION ARTIFACT'
               3='OTHER';




VALUE ACCEPTED
               1='ACCEPTED'
               2='REJECTED';




VALUE SCANQUAL
               1='EXCELLENT'
               2='SLIGHT ARTIFACT/MOTION'
               3='SEVERE ARTIFACT/MOTION - INADEQUATE';




* FORMAT RATING IS DEFINED FOR VARIABLES: RICA_A RMCA_A RACA_A RPCA_A LICA_A
  LMCA_A LACA_A LPCA_A BASILRA;

VALUE RATING
               1='NORMAL'
               2='STENOSIS - MILD'
               3='STENOSIS - MODERATE'
               4='STENOSIS - SEVERE'
               5='OCCLUSION'
               6='NOT ASSESSABLE'
               7='DEPHASING ARTIFACT, LIKELY NORMAL'
               8='CONGENITALLY ABSENT OR HYPOPLASTIC (SMALL)';




* FORMAT $STATUS IS DEFINED FOR VARIABLES: RICA_B1 RMCA_B1
```

```
   RACA_B1 RPCA_B1 LICA_B1 LMCA_B1 LACA_B1 LPCA_B1 BASILRB1
   RPCOA_B1 LPCOA_B1 RHBLD_B1 LHBLD_B1;

VALUE $STATUS
                'A'='IMPROVED'
                'B'='SAME (NO PROGRESSION)'
                'C'='WORSE (PROGRESSION)'
                'D'='CANNOT DETERMINE'
                'E'='N/A';




* FORMAT PCOA IS DEFINED FOR VARIABLES: RPCOA_A LPCOA_A;

VALUE PCOA
                1='NORMAL'
                2='SMALL'
                3='NOT VISUALIZED';




* FORMAT FLOW IS DEFINED FOR VARIABLES: RHBLD_A LHBLD_A;

VALUE FLOW
                1='GOOD'
                2='POOR'
                3='INDETERMINATE';




* FORMAT REAS IS DEFINED FOR VARIABLES: REASINC REASINC2;

VALUE REAS
                1='UNSEG MIPS MISSING'
                2='UNSEG MIPS WRONG'
                3='SEG MIPS MISSING'
                4='SEG MIPS WRONG'
                5='UNSEG TILTS MISSING'
                6='UNSEG TILTS WRONG'
                7='OTHER';



format ON_TAPE ADEQUATE COMPPREV IREP_REC SOURCE TARGETED UNSEGPAR COMMENTS NO_YES.
       INADREAS REJ_REAS REASON.
       ACCEPTED ACCEPTED.
       SCANQUAL SCANQUAL.
       RICA_A RMCA_A RACA_A RPCA_A LICA_A LMCA_A LACA_A LPCA_A BASILRA RATING.
       RICA_B1 RMCA_B1 RACA_B1 RPCA_B1 LICA_B1 LMCA_B1 LACA_B1 LPCA_B1 BASILRB1
       RPCOA_B1 LPCOA_B1 RHBLD_B1 LHBLD_B1 $STATUS.
       RPCOA_A LPCOA_A PCOA.
       RHBLD_A LHBLD_A FLOW.
       REASINC REASINC2 REAS.;

RUN;
QUIT;
```

```
ON_TAPE ------------------------------- A31 MRA DATA AVAILABLE ON TAPE/OP-DISK
                 type:  numeric (float)
                label:  ON_TAPE

                range:  [1,2]                        units:  1
        unique values:  2               coded missing:  22 / 277

          tabulation:  Freq.   Numeric  Label
                          5         1  NO
                        250         2  YES
```

```
ADEQUATE --------------------------------- A4 MRA FILMS ADEQUATE FOR INTERPRET
                 type:  numeric (float)
                label:  ADEQUATE

                range:  [1,2]                        units:  1
        unique values:  2               coded missing:  27 / 277

          tabulation:  Freq.   Numeric  Label
                          1         1  NO
                        249         2  YES
```

```
INADREAS ------------------------------------ A4A REASON MRA FILMS INADEQUATE
                 type:  numeric (float)
                label:  INADREAS

                range:  [.,.]                        units:  .
        unique values:  0               coded missing:  277 / 277

          tabulation:  Freq.   Numeric  Label
```

INADREAS:
  1. Required only if ADEQUATE=1.

```
REAS_SP ---------------------------------------- A4B SPECIFY REASON INADEQUATE
                 type:  string (str20)

        unique values:  1               coded missing:  0 / 277

          tabulation:  Freq.  Value
                        277   "C"
```

REAS_SP:
  1. Required only if INADREAS=3.

```
MACHINE -------------------------------------------------------- A6 MACHINE/MODEL
                  type:  string (str30)

          unique values:  3                    coded missing:  0 / 277

             tabulation:  Freq.  Value
                           134  "GE SIGNA"
                            72  "PICKER EDGE"
                            71  "SIEMENS"



ECHOTIME ------------------------------------------------------- A7 ECHO TIME (ms)
                  type:  numeric (float)

                 range:  [2,7.5]                    units:  .1
          unique values:  25                 coded missing:  8 / 277

tabulation:
Freq.    Value                           Freq.    Value
    1        2                               2      4.5
    1      2.5                              13      4.8
    5      2.8                              21        5
    6      2.9                              72      5.1
    4      3.1                               1      5.6
    3      3.2                              26        6
   15      3.3                               4      6.4
    3      3.6                               5      6.5
   28      3.7                              10      6.9
    1      4.1                               1        7
    3      4.2                               1      7.3
   35      4.3                               5      7.5
    3      4.4



MATRIX1 -------------------------------------------------- A8A MATRIX (1st dim)
                  type:  numeric (float)

                 range:  [133,512]                  units:  1
          unique values:  8                 coded missing:  19 / 277

             tabulation:  Freq.  Value
                            1    133
                            1    138
                            8    182
                           56    192
                           12    219
                           46    256
                           72    480
                           62    512
```

MATRIX2 --- A8B MATRIX (2nd dim)
                type: numeric (float)

              range: [128,516]   units: 1
      unique values: 8   coded missing: 19 / 277

          tabulation: Freq. Value
                          1   128
                          1   156
                          1   160
                         34   192
                          4   224
                        110   256
                        105   512
                          2   516

FLDVIEW1 -- A9A FIELD OF VIEW (cm)
                type: numeric (float)

              range: [13,25]   units: 1
      unique values: 10   coded missing: 42 / 277

          tabulation: Freq. Value
                          2   13
                         27   16
                          5   18
                         36   19
                         51   20
                         16   21
                         12   22
                          5   23
                         74   24
                          7   25

FLDVIEW1:
  1. Required only if square FOV.

FLDVIEWA ------------------------------- A9B1 FIELD OF VIEW (cm) - RECT, 1st DIM
                type: numeric (float)

              range: [18,21]   units: 1
      unique values: 3   coded missing: 252 / 277

          tabulation: Freq. Value
                         13   18
                          9   20
                          3   21

FLDVIEWA:
  1. Required only if rectangular FOV.

FLDVIEWB ---------------------------- A9B2 FIELD OF VIEW (cm) - RECT, 2nd DIM
                type: numeric (float)

               range: [13,15]   units: 1
       unique values: 2   coded missing: 252 / 277

          tabulation: Freq. Value
                         13   13
                         12   15

FLDVIEWB:
  1. Required only if rectangular FOV.

```
COMPPREV ---------------------------------- C1 IS IT COMPARED TO PREVIOUS SCAN
                type:  numeric (float)
                label:  COMPPREV

                range:  [1,2]                        units:  1
        unique values:  2                    coded missing:  148 / 277

           tabulation:  Freq.   Numeric  Label
                         119          1  NO
                          10          2  YES
```

COMPPREV:
  1. Required only if ACCEPTED=1.

```
IREP_REC ----------------------------------- C2 INSTITUTIONAL REPORT RECEIVED
                type:  numeric (float)
                label:  IREP_REC

                range:  [1,2]                        units:  1
        unique values:  2                    coded missing:  148 / 277

           tabulation:  Freq.   Numeric  Label
                          12          1  NO
                         117          2  YES
```

IREP_REC:
  1. Required only if ACCEPTED=1.

```
READER1 -------------------------------------- D1A READER 1 (INITIALS)     DELETED


                type:  string (str3)

        unique values:  4                    coded missing:  0 / 277

           tabulation:  Freq.  Value
                         148   "-1"
                          11   "FM"
                          22   "JAB"
                          96   "RZ"
```

```
READER2 -------------------------------------- D1B READER 2 (INITIALS)     DELETED


                type:  string (str3)

        unique values:  3                    coded missing:  0 / 277

           tabulation:  Freq.  Value
                         148   "-1"
                         118   "FM"
                          11   "RZ"
```

```
ACCEPTED ------------------------------------------------- D3 STUDY ACCEPTED
              type:  numeric (float)
             label:  ACCEPTED

             range:  [1,2]                        units:  1
     unique values:  2                    coded missing:  23 / 277

        tabulation:  Freq.    Numeric  Label
                       129          1  ACCEPTED
                       125          2  REJECTED


REJ_REAS --------------------------------------------- D3A REASON NOT ACCEPTED
              type:  numeric (float)
             label:  REJ_REAS

             range:  [1,3]                        units:  1
     unique values:  3                    coded missing:  152 / 277

        tabulation:  Freq.    Numeric  Label
                        49          1  INCOMPLETE STUDY
                        16          2  MOTION ARTIFACT
                        60          3  OTHER

REJ_REAS:
  1.  Required only if ACCEPTED=2.


REJ_TEXT ------------------------------ D3B SPECIFY OTHER REASON NOT ACCEPTED
              type:  string (str65)

     unique values:  10                   coded missing:  0 / 277

        tabulation:  Freq.  Value
                       216  "C"
                         1  "ACQUISITION PROBLEM: BAD MOTSA"
                         1  "ACQUISITION PROBLEM: DID NOT COVER ANATOMY,
                             NO SEGMENTATION"
                         1  "ACQUISITION PROBLEM: NEED SINGLE SLAB,
                            NO MOTSA"
                         1  "ACQUISITION PROBLEM: POOR CHOICE OF VOLUME"
                         1  "ACQUISITION PROBLEM: POST CIRCULATION CUT OFF"
                         1  "ACQUISITION PROBLEM: PULSATION ARTIFACT
                            IN ANTERIOR CIRCULATION"
                        53  "ECHO TIME > 5 cm/s"
                         1  "POOR QUALITY"
                         1  "VERY NARROW AREA OF INTEREST"
```

```
SCANQUAL ------------------------------------------------------ D4 SCAN QUALITY
                type:  numeric (float)
                label:  SCANQUAL

                range:  [2,2]                          units:  1
        unique values:  1                      coded missing:  148 / 277

            tabulation:  Freq.   Numeric  Label
                          129        2  SLIGHT ARTIFACT/MOTION
```

SCANQUAL:
  1. Required only if DTE_READ has non-missing value.

```
SOURCE -------------------------------------------- D5A SOURCE AVAIL FOR REVIEW
                type:  numeric (float)
                label:  SOURCE

                range:  [2,2]                          units:  1
        unique values:  1                      coded missing:  148 / 277

            tabulation:  Freq.   Numeric  Label
                          129        2  YES
```

SOURCE:
  1. Required only if DTE_READ has non-missing value.

```
TARGETED ------------------------------------------ D5B TARGETED AVAIL FOR REVIEW
                type:  numeric (float)
                label:  TARGETED

                range:  [2,2]                          units:  1
        unique values:  1                      coded missing:  151 / 277

            tabulation:  Freq.   Numeric  Label
                          126        2  YES
```

TARGETED:
  1. Required only if DTE_READ has non-missing value.

```
UNSEGPAR ----------------------------- D5C UNSEGMENTED PARAX AVAIL FOR REVIEW
                type:  numeric (float)
                label:  UNSEGPAR

                range:  [1,2]                          units:  1
        unique values:  2                      coded missing:  187 / 277

            tabulation:  Freq.   Numeric  Label
                            1        1  NO
                           89        2  YES
```

```
    UNSEGPAR:
      1.  Required only if DTE_READ has non-missing value.
RICA_A ----------------------------------------- E1A RIGHT ICA - RATING
                type:  numeric (float)
               label:  RICA_A

               range:  [1,5]                     units:  1
       unique values:  4              coded missing:  148 / 277

          tabulation:  Freq.   Numeric  Label
                        126         1   NORMAL
                          1         2   STENOSIS - MILD
                          1         4   STENOSIS - SEVERE
                          1         5   OCCLUSION


RICA_B1 ------------------------------- E1B1 RIGHT ICA - COMP STATUS TO BASELN
                type:  string (str2)

       unique values:  2              coded missing:  0 / 277

          tabulation:  Freq.  Value
                        267   "C"
                         10   "B"

RICA_B1:
    1.  Required only if COMPPREV=2.


RMCA_A ----------------------------------------- E2A RIGHT MCA - RATING
                type:  numeric (float)
               label:  RMCA_A

               range:  [1,7]                     units:  1
       unique values:  3              coded missing:  148 / 277

          tabulation:  Freq.   Numeric  Label
                        127         1   NORMAL
                          1         5   OCCLUSION
                          1         7   DEPHASING ARTIFACT, LIKELY NORMAL


RMCA_B1 ------------------------------- E2B1 RIGHT MCA - COMP STATUS TO BASELN
                type:  string (str2)

       unique values:  2              coded missing:  0 / 277

          tabulation:  Freq.  Value
                        267   "C"
                         10   "B"

RMCA_B1:
    1.  Required only if COMPPREV=2.
```

```
RACA_A -------------------------------------------- E3A RIGHT ACA - RATING
              type:  numeric (float)
              label:  RACA_A

              range:  [1,8]                        units:  1
      unique values:  3                    coded missing:  148 / 277

          tabulation:  Freq.   Numeric  Label
                        123         1   NORMAL
                          1         3   STENOSIS - MODERATE
                          5         8   CONGENITALLY ABSENT OR HYPOPLASTIC (SMALL)


RACA_B1 ------------------------------ E3B1 RIGHT ACA - COMP STATUS TO BASELN
              type:  string (str2)

      unique values:  2                    coded missing:  0 / 277

          tabulation:  Freq.  Value
                        267   "C"
                         10   "B"

RACA_B1:
  1.  Required only if COMPPREV=2.


RPCA_A -------------------------------------------- E4A RIGHT PCA - RATING
              type:  numeric (float)
              label:  RPCA_A

              range:  [1,1]                        units:  1
      unique values:  1                    coded missing:  148 / 277

          tabulation:  Freq.   Numeric  Label
                        129         1   NORMAL


RPCA_B1 ------------------------------ E4B1 RIGHT PCA - COMP STATUS TO BASELN
              type:  string (str2)

      unique values:  2                    coded missing:  0 / 277

          tabulation:  Freq.  Value
                        267   "C"
                         10   "B"

RPCA_B1:
  1.  Required only if COMPPREV=2.
```

```
LICA_A ------------------------------------------------ E5A LEFT ICA - RATING
              type:  numeric (float)
             label:  LICA_A

             range:  [1,5]                         units:  1
     unique values:  3                     coded missing:  148 / 277

         tabulation:  Freq.   Numeric  Label
                        125         1  NORMAL
                          3         4  STENOSIS - SEVERE
                          1         5  OCCLUSION


LICA_B1 ------------------------------- E5B1 LEFT ICA - COMP STATUS TO BASELN
              type:  string (str2)

     unique values:  2                     coded missing:  0 / 277

         tabulation:  Freq.  Value
                        267  "C"
                         10  "B"

LICA_B1:
  1.  Required only if COMPPREV=2.


LMCA_A ------------------------------------------------ E6A LEFT MCA - RATING
              type:  numeric (float)
             label:  LMCA_A

             range:  [1,5]                         units:  1
     unique values:  3                     coded missing:  148 / 277

         tabulation:  Freq.   Numeric  Label
                        127         1  NORMAL
                          1         4  STENOSIS - SEVERE
                          1         5  OCCLUSION


LMCA_B1 ------------------------------- E6B1 LEFT ACA - COMP STATUS TO BASELN
              type:  string (str2)

     unique values:  2                     coded missing:  0 / 277

         tabulation:  Freq.  Value
                        267  "C"
                         10  "B"

LMCA_B1:
  1.  Required only if COMPPREV=2.
```

LACA_A --- E7A LEFT ACA - RATING
                  type: numeric (float)
                 label: LACA_A

                 range: [1,8]   units: 1
         unique values: 4   coded missing: 148 / 277

            tabulation: Freq.   Numeric Label
                          126   1 NORMAL
                            1   2 STENOSIS - MILD
                            1   4 STENOSIS - SEVERE
                            1   8 CONGENITALLY ABSENT OR HYPOPLASTIC (SMALL)

LACA_B1 ------------------------------- E7B1 LEFT ACA - COMP STATUS TO BASELN
                  type: string (str2)

         unique values: 2   coded missing: 0 / 277

            tabulation: Freq. Value
                          267 "C"
                           10 "B"

LACA_B1:
  1. Required only if COMPPREV=2.

LPCA_A --- E8A LEFT PCA - RATING
                  type: numeric (float)
                 label: LPCA_A

                 range: [1,1]   units: 1
         unique values: 1   coded missing: 148 / 277

            tabulation: Freq.   Numeric Label
                          129   1 NORMAL

LPCA_B1 -------------------------------- E8B1 LEFT PCA - COMP STATUS TO BASELN
                  type: string (str2)

         unique values: 2   coded missing: 0 / 277

            tabulation: Freq. Value
                          267 "C"
                           10 "B"

LPCA_B1:
  1. Required only if COMPPREV=2.

```
BASILRA ------------------------------------------------- E9A BASILAR - RATING
              type:  numeric (float)
             label:  BASILRA

             range:  [1,1]                        units:  1
     unique values:  1                    coded missing:  148 / 277

        tabulation:  Freq.   Numeric  Label
                       129         1  NORMAL


BASILRB1 ------------------------------- E9B1 BASILAR - COMP STATUS TO BASELN
              type:  string (str2)

     unique values:  2                    coded missing:  0 / 277

        tabulation:  Freq.  Value
                       267  "C"
                        10  "B"

BASILRB1:
  1.  Required only if COMPPREV=2.


RPCOA_A --------------------------------------------- E10A RIGHT PCoA - RATING
              type:  numeric (float)
             label:  RPCOA_A

             range:  [1,3]                        units:  1
     unique values:  3                    coded missing:  148 / 277

        tabulation:  Freq.   Numeric  Label
                       101         1  NORMAL
                        19         2  SMALL
                         9         3  NOT VISUALIZED


RPCOA_B1 --------------------------- E10B1 RIGHT PCoA - COMP STATUS TO BASELN
              type:  string (str2)

     unique values:  2                    coded missing:  0 / 277

        tabulation:  Freq.  Value
                       269  "C"
                         8  "B"

RPCOA_B1:
  1.  Required only if COMPPREV=2.
```

```
LPCOA_A ------------------------------------------ E11A LEFT PCoA - RATING
                type:  numeric (float)
                label:  LPCOA_A

                range:  [1,3]                           units:  1
        unique values:  3                       coded missing:  148 / 277

            tabulation:  Freq.    Numeric  Label
                          110          1   NORMAL
                           18          2   SMALL
                            1          3   NOT VISUALIZED


LPCOA_B1 ---------------------------- E11B1 LEFT PCoA - COMP STATUS TO BASELN
                type:  string (str2)

        unique values:  2                       coded missing:  0 / 277

            tabulation:  Freq.  Value
                          267   "C"
                           10   "B"

LPCOA_B1:
  1.  Required only if COMPPREV=2.


RHBLD_A ------------------------------- E12A ROBUSTNESS RT HEMISPHERE BLD FLOW
                type:  numeric (float)
                label:  RHBLD_A

                range:  [1,2]                           units:  1
        unique values:  2                       coded missing:  148 / 277

            tabulation:  Freq.    Numeric  Label
                          126          1   GOOD
                            3          2   POOR


RHBLD_B1 ---------------------------- E12B1 RT HEM BLD FLOW - STATUS TO BASELN
                type:  string (str2)

        unique values:  2                       coded missing:  0 / 277

            tabulation:  Freq.  Value
                          267   "C"
                           10   "B"

RHBLD_B1:
  1.  Required only if COMPPREV=2.
```

```
LHBLD_A ---------------------------- E13A ROBUSTNESS LFT HEMISPHERE BLD FLOW
               type:  numeric (float)
              label:  LHBLD_A

              range:  [1,2]                        units:  1
      unique values:  2              coded missing:  148 / 277

          tabulation:  Freq.    Numeric  Label
                        126         1    GOOD
                          3         2    POOR


LHBLD_B1 --------------------------- E13B1 LFT HEM BLD FLOW - STATUS TO BASE
               type:  string (str2)

      unique values:  2              coded missing:  0 / 277

          tabulation:  Freq.  Value
                        267   "C"
                         10   "B"

LHBLD_B1:
  1.  Required only if COMPPREV=2.


COMMENTS -------------------------------------------------------- COMMENTS
               type:  numeric (float)
              label:  COMMENTS

              range:  [1,2]                        units:  1
      unique values:  2              coded missing:  148 / 277

          tabulation:  Freq.    Numeric  Label
                        126         1    NO
                          3         2    YES


COMM_TXT -------------------------------------------------------- COMMENTS
               type:  string (str60)

      unique values:  4              coded missing:  0 / 277

          tabulation:  Freq.  Value
                        274   "C"
                          1   "COLLATERALS FROM VERT BASILAR - MOYA"
                          1   "CONGENITAL VARIANT - RPCOA - NO BASILAR CONNECTION"
                          1   "GOOD COLLATERAL FLOW THROUGH ACOM AND PCOM"

COMM_TXT:
  1.  Required only if COMMENTS=2.
```

```
REASINC ------------------------------------------------ REASON INCOMPLETE 1
             type:  numeric (float)
            label:  REASINC

            range:  [2,4]                        units:  1
    unique values:  3                    coded missing:  228 / 277

       tabulation:  Freq.   Numeric  Label
                        1         2  UNSEG MIPS WRONG
                       19         3  SEG MIPS MISSING
                       29         4  SEG MIPS WRONG


REASINC2 ----------------------------------------------- REASON INCOMPLETE 2
             type:  numeric (float)
            label:  REASINC2

            range:  [4,7]                        units:  1
    unique values:  3                    coded missing:  273 / 277

       tabulation:  Freq.   Numeric  Label
                        1         4  SEG MIPS WRONG
                        2         6  UNSEG TILTS WRONG
                        1         7  OTHER




_dta:
   1.  Created 07/03/00.
```