

**CSSCD Phase 3**  
**2.2: MRA Form – Form MRA**

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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 juxtaseilar 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.

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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.

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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 than 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).

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I. Computed Variables: None

J. Inter-Relationship With Other Datasets:

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

Form Abbreviation	SAS Dataset	See Section
MR3	<b><u>MRI PUBN.SD2</u></b>	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	<b><u>NPC PUBN.SD2</u></b>	2.3
ACC	<b><u>ACC PUBN.SD2</u></b>	2.4
NPP	<b><u>NPP PUBN.SD2</u></b>	2.5
PVTQ	<b><u>PVTQPUBN.SD2</u></b>	2.6
FES	<b><u>FES PUBN.SD2</u></b>	2.7
ACBC	<b><u>ACBCPUBN.SD2</u></b>	2.8

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**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:	<b>INADREAS</b>	
<input type="checkbox"/> 1. Incomplete Study	<input type="checkbox"/> 2. Motion Artifact	<input type="checkbox"/> 3. Other → A4.b. Specify: _____ <b>REAS_SP</b>
<b>RESCHEDULE STUDY WITHIN TWO WEEKS</b>		

A5. Name of Imaging Center: **IMG\_CTRL** \_\_\_\_\_

A6. Machine/Model: \_\_\_\_\_ **MACHINE**

A7. Echo Time (ms): \_\_\_\_\_ **ECHOTIME**  .

A8. Matrix: \_\_\_\_\_ **MATRIX1** X \_\_\_\_\_ **MATRIX2**

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**

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**TO BE COMPLETED TO BE COMPLETED AT THE SCC**

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

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

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:	
<input type="checkbox"/> 1. Incomplete Study	<input type="checkbox"/> 2. Motion Artifact
<input type="checkbox"/> 3. Other →	D3.b. Specify: _____ <b>REJ_REAS</b>

D4. **SCAN QUALITY (CHECK ONE):** **SCANQUAL**  1. Excellent  
 2. Slight Artifact/Motion, Adequate  
 3. Severe Artifact/Motion, Inadequate

D5. **IMAGES AVAILABLE FOR REVIEW:**

	<b>1. NO</b>	<b>2. YES</b>	
A. Source Images	<input type="checkbox"/>	<input type="checkbox"/>	<b>SOURCE</b>
B. Targeted MIP Images	<input type="checkbox"/>	<input type="checkbox"/>	<b>TARGETED</b>
C. Unsegmented Paraxial Images	<input type="checkbox"/>	<input type="checkbox"/>	<b>UNSEGP</b>

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

a. RATING	b. STATUS
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1 = NORMAL  
 2 = STENOSIS, MILD  
 3 = STENOSIS, MODERATE  
 4 = STENOSIS, SEVERE  
 5 = OCCLUSION  
 6 = NOT ASSESSABLE  
 7 = DEPHASING ARTIFACT, LIKELY NORMAL

A = IMPROVED  
 B = SAME (NO PROGRESSION)  
 C = WORSE (PROGRESSION)  
 D = CANNOT DETERMINE  
 E = N/A

		RATING			STATUS COMPARED TO					
					Baseline Study	Previous Study				
E1.	RIGHT ICA	a.	<input type="text"/>	RICA_A	b1.	<input type="text"/>	b2.	<input type="text"/>	RICA_B1	
E2.	RIGHT MCA	a.	<input type="text"/>	RMCA_A	b1.	<input type="text"/>	b2.	<input type="text"/>	RMCA_B1	
E3.	RIGHT ACA	a.	<input type="text"/>	RACA_A	b1.	<input type="text"/>	b2.	<input type="text"/>	RACA_B1	
E4.	RIGHT PCA	a.	<input type="text"/>	RPCA_A	b1.	<input type="text"/>	b2.	<input type="text"/>	RPCA_B1	
E5.	LEFT ICA	a.	<input type="text"/>	LICA_A	b1.	<input type="text"/>	b2.	<input type="text"/>	LICA_B1	
E6.	LEFT MCA	a.	<input type="text"/>	LMCA_A	b1.	<input type="text"/>	b2.	<input type="text"/>	LMCA_B1	
E7.	LEFT ACA	a.	<input type="text"/>	LACA_A	b1.	<input type="text"/>	b2.	<input type="text"/>	LACA_B1	
E8.	LEFT PCA	a.	<input type="text"/>	LPCA_A	b1.	<input type="text"/>	b2.	<input type="text"/>	LPCA_B1	
E9.	BASILAR	a.	<input type="text"/>	BASILRA	b1.	<input type="text"/>	b2.	<input type="text"/>	BASILRB1	
		<b>1.NORMAL</b>	<b>2.SMALL</b>	<b>3.NOT VISUALIZED</b>						
E10a.	RIGHT PCoA	<input type="text"/>	<input type="text"/>	<input type="text"/>	RPCOA_A	b1.	<input type="text"/>	b2.	<input type="text"/>	RPCOA_B1
E11a.	LEFT PCoA	<input type="text"/>	<input type="text"/>	<input type="text"/>	LPCOA_A	b1.	<input type="text"/>	b2.	<input type="text"/>	LPCOA_B1
		<b>1.GOOD</b>	<b>2.POOR</b>	<b>3.INDETERMINATE</b>						
E12a.	Robustness of Right Hemisphere blood flow	<input type="text"/>	<input type="text"/>	<input type="text"/>	RHBLD_A	b1.	<input type="text"/>	b2.	<input type="text"/>	RHBLD_B1
E13a.	Robustness of Left Hemisphere blood flow	<input type="text"/>	<input type="text"/>	<input type="text"/>	LHBLD_A	b1.	<input type="text"/>	b2.	<input type="text"/>	LHBLD_B1

**F. COMMENTS:**

**COMMENTS**

COMM\_TXT

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**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 A1. 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

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(TE). The echo time should be  $\leq 5$  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**

**CODEBOOK FOR CSSCD FORM MRA  
MRA FORM**

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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

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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)

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The SAS System

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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	UNSEGPAP	Num	8	207	2.	2.	D5C UNSEGMENTED PARAX AVAIL FOR REVIEW

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\*\*\*\*\*  
\* 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 UNSEGPART 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

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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 UNSEGP PAR 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;

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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
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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.



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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

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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.

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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.

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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"

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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"

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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.

UNSEGPARG ----- D5C UNSEGMENTED PARAX AVAIL FOR REVIEW

type: numeric (float)

label: UNSEGPARG

range: [1,2]

units: 1

unique values: 2

coded missing: 187 / 277

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

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UNSEGPARG:

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.

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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.



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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.

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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.

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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.

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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.

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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.

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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.