

HOME HEALTH PPS: GROUPER MODULE VERSION 02.03 AND RELATED FILES

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This README file, as well as the rest of the contents of the .ZIP files HHRG0203.ZIP and HHRGT203.ZIP dated 9/12/2008, replace the previous version grouper files HHRG0202.EXE and HHRGT0202.EXE. The contents of HHRG0203.ZIP and HHRGT203.ZIP should be reviewed by all software developers who relied on their predecessors for creating home health PPS grouper applications. HHRG0203.ZIP contains updated grouper software. HHRGT203.ZIP contains documentation for the software in the form of `pseudocode` text files and tables, as well as test cases.

VERSION NOTE - Version 02.03:

The grouping algorithm for Version 02.03 is an updated and revised version of the Grouper.DLL that was released on January 28, 2008 (Version 02.02, dated 1/16/2008). It also accommodates updates to the ICD-9-CM diagnosis codes which will become effective October 1, 2008. As with Version 2.02, the documentation is presented in separate sections for the logic applicable to episodes starting through 12/31/2007 (Grouper Version 1.06) and the logic effective for episodes starting on or after 1/1/2008 - Grouper Version 2.03. (Note that the ICD-9-CM-related updates are effective October 1, 2008, but certain other changes/updates to the grouper are effective for all episodes subject to the PPS refinements of 2008.) Specifications that apply to all revisions of Grouper Version 2 (i.e., the classification under the PPS refinements of 2008) are labeled generically below as related to `Grouper 02.0n`. When there are specific differences between Version 2.03 and Version 2.02, they are highlighted.

The Grouper 02.03 software module (Grouper.DLL) includes the grouping logic applicable to all assessments since the inception of the home health PPS as well as the current algorithm. Therefore, home health agencies (or their software vendors) need install only this module to accommodate episodes starting before or during 2008. Since the changes to the software other than those related to the October, 2008, ICD-9-CM updates are minor and affect very few assessments, it is unlikely to be efficient for agencies that used Grouper 02.02 to obtain HIPPS codes used on claims to reprocess those assessments using Grouper 02.03 to determine if a different HIPPS code is produced with the new version, but this is an option.

These .ZIP files together include all the files related to the Medicare Home Health Prospective Payment System patient classification algorithm, or `Grouper`. This algorithm is used to classify patients who receive an episode of home care into groups used to determine Medicare payment for covered episodes of care. Version 02.0n generates the Health Insurance Prospective Payment System (HIPPS) code to be used for Medicare home health billing; a flag that indicates whether any of the data that could have been used to generate the classification were invalid; and a claim-OASIS matching string also used for billing purposes.

1) HHRGT203.ZIP includes the following files:

READM203.PDF	This Adobe Acrobat® file, which provides an overview of the grouping algorithm and discusses general parameters
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for the operation of the Grouper (which should be replicated by any vendor-developed grouping application).

PSEU0203.PDF	A file that lays out the patient classification and HIPPS code assignment logic as `pseudocode` which vendors can use as guidance when coding the grouper logic into their own applications.
PSEUR203.PDF	A `changes document` that shows the differences between this version of the pseudocode and the previous version (Pseu0202.PDF, dated 1/28/2008).
PSEU0203_TABLES.XLS	Appendix tables for the current pseudocode logic in MS Excel® format.
PSEU0203_TABLES.PDF	Appendix tables for the current pseudocode logic in .PDF (Section 508-compliant) format.
TESTDATA203_PT1.TXT TESTDATA203_PT2.TXT TESTDATA203_PT3.TXT	Three text files with over 65,000 test records. These records include the OASIS variables that are used by the Grouper, placed according to their positions in the CMS standard OASIS submission 1448-byte record layout. The records in this file include a range of values for the variables used by the Grouper in casemix classification and HIPPS code assignment in Version 02.0n. The outputs from the Grouper .DLL are included in a `filler` area toward the end of each record (starting in col. 970). This file can be used to assess the accuracy of HHRG assignments made using vendors` own versions of the classification logic. Note that these cases do not necessarily make `clinical sense`; they are artificially constructed to test the grouping logic and to make it easy to see what is being tested. (For example, in records where diagnosis codes are not being used for testing, they may be set to `899.99` or other nonexistent codes.)

VERSION NOTE - Version 02.03:
The test data files for Version 02.03 have been expanded to include records that test the impact of ICD-9-CM updates effective October 1, 2008 (both the current casemix codes which become invalid as of that date, as well as new codes which become effective as casemix codes as of that date). In addition, the test data include records which exemplify the rare data combinations which were handled incorrectly by Version 02.02 of the Grouper software. As before, to simplify review of cases, test data records may not include (or conform to all OASIS data specifications for) variables not used by the Grouper.DLL, and the records may not make `clinical sense.` While TESTDATA203_PT3.TXT is the file that includes the new records, the HIPPS code and/or claim-OASIS matching key calculated for a few records in the previously-existing files (Pts. 1 and 2) may have changed due to the updates in the Grouper software.

TEST106D.TXT	The test file of 2,930 records used with Version 1.06 that can (still) be used for testing classification of episodes that started before 1/1/2008.
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You can use the Adobe Acrobat® reader program (or others) to view or print the PDF files. Adobe Acrobat® is available for free download from <http://www.adobe.com>.

2) HHRG0203.ZIP includes the following files:

GROUPER.DLL The 32-bit grouper .DLL that can be called from C++ or Visual Basic applications.

VERSION NOTES - Version 02.03:

The Grouper.DLL file name remains the same for Version 02.03 which is now dated 8-20-2008. Like Version 02.02 of the Grouper, this program is not compatible with Versions 1.0x (though it includes the older grouping logic and can correctly group older assessments). Also, the single function is (still) named `process_record_v201` and it (still) returns four parameters rather than three as in Version 1.0x.

ICD-9-CM UPDATES: Grouper version 02.03 is being issued in 2008 mainly to accommodate changes to the ICD-9-CM diagnosis codes that are effective October 1, 2008. Certain diagnosis codes used by the grouper become invalid as of October 1, 2008, and are `dropped` from the logic used to generate HIPPS codes from OASIS assessments with completion dates (M0090) as of that date. If these codes are encountered on an assessment with a later completion date, they will not be scored. In a situation where a 4-digit code is being replaced with one or more 5-digit codes, the use of the outdated 4-digit code after October 1, 2008, could possibly trigger an `incomplete code` error and turn on the data validity flag. If a diagnosis code that is recognized by the grouper only after October 1, 2008, is encountered on an assessment before its effective date, it will not be recognized for scoring and will be treated as an irrelevant diagnosis (and the data validity flag will not be turned on).

In addition to diagnosis code changes related to the October 1, 2008, ICD-9-CM updates, CMS has made some additional changes in the use of other (existing) ICD-9-CM codes used for scoring cases. These are mainly changes in the recognition of specific codes in the 078 category as allowable etiologies for specific secondary-only/ manifestation casemix diagnoses. These changes are shown in Pseudocode Appendix Table 3, Part 1, and will also be effective for assessments dated October 1, 2008, or later.

There are too many individual ICD-9-CM code changes to list them individually in this document. In the Pseudocode Appendix Tables that deal with diagnosis codes (Tables 1, 2, 3, 4, 6, and 7), codes that become effective and/or part of the Grouper as of October 1, 2008, are marked with an asterisk (*); those that become INVALID and/or not part of the Grouper as of that date are indicated with a pound sign (#). Note that both sets of codes are retained in the tables because this pseudocode and the tables must provide guidance on dealing with OASIS assessments completed on any date.

OTHER CHANGES: A few bugs identified in previous Version 02.02 of the Grouper .DLL software and the pseudocode have been addressed in this version. These include the following:

1. Treatment of invalid values of M0826: If the previous version of the grouper encountered invalid data in M0826 that included numbers, it sometimes calculated an incorrect grouping step (initial digit of the HIPPS code) and/or clinical or functional scores. Version 02.03 does not do this. (As before, the

service domain validity flag is turned on to indicate the presence of a problem.)

2. Scoring of diabetic ulcers coded in M0246 following a V_code in M0230: Previously the Grouper .DLL would score points for diabetic ulcers coded in M0246 without the presence of an allowable V-code (from Appendix Table 4) in M0230. If the V-code in M0230 was a payment V-code, the DLL would still score the diabetic ulcers rather than (correctly) scoring the V-code and not scoring the ulcers. Version 02.03 does not do this.

3. Manifestation data validity flag for manifestation codes in M0246 without V-code in M0230/M0240: Previously, the grouper .DLL would `turn on` the data validity flag to indicate a manifestation code sequencing problem when it encountered a manifestation code in M0246 without an etiology, even without an allowable V-code in the M0230/M0240 of the same row to indicate that codes in M0246 should be evaluated.

4. Scoring NRS points for M0476 on followup/recert assessments though M0470 is blank: Previously, the Grouper .DLL would award NRS points for M0476 = 02 or 03 even though M0470 was blank or 00. Version 02.03 does not do this.

CHANGES IN THE DOCUMENTATION: The documents accompanying the grouper, such as the pseudocode, have also been updated. In addition to the editorial changes required to accommodate the change in version number from 02.02 to 02.03, and documenting the changes in the Grouper .DLL, some changes and corrections have been made. These are presented in the `changes` document, `PSEUR203.pdf`. The most notable logic change includes the addition of logic for scoring of diabetic ulcers coded in M0246. Previously, the pseudocode did not present any logic for the scoring of diabetic ulcers coded in M0246 following an allowable V-code in M0230/M0240.

GROUPER.LIB	The .DLL's associated import library file that should be used when calling the .DLL in C++.
GROUPER.H	C header file to allow other applications to call GROUPER.DLL
TESTDLL.EXE	Executable program demonstrating use of the .DLL with a C++ application.
TESTDLL.CPP	Source code for TESTDLL.EXE.
VBDLL.EXE	Executable program demonstrating use of the .DLL with a Visual Basic application.
VBDLL.FRM	Source code for VBDLL.EXE.
READM203.PDF	(A copy of) this Adobe Acrobat® file, which provides an overview of the grouping algorithm and discusses general parameters for the operation of the Grouper (which should be replicated by any vendor-developed grouping application).

BACKGROUND INFORMATION:

The Casemix Model

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The home health casemix model classifies an episode of care based on patient characteristics at the beginning of the episode, as measured using selected items within the OASIS-B1 (08/2000, 12/2002, or 1/2008) patient assessment data set. Based on the values for the selected items, each episode is assigned to a severity category (e.g., low, moderate, high, max, etc.) for each of three domains (clinical, functional, and service utilization). For episodes starting 1/1/2008 or later, the classification also relies on the grouping step, a value 1 to 5 which is based on the position of the episode within a sequence of adjacent Medicare payment episodes (earlier or later) and the number of rehabilitation therapy visits. This produces 153 possible groups (see Table 1).

Also effective for episodes starting on or after 1/1/2008, there is a separate classification algorithm determining payment for non-routine medical supplies (NRS). Based on a separate subset of variables from the OASIS assessment, episodes are assigned to one of six NRS payment categories.

Assigning HIPPS Codes

Home health claims submitted under the PPS are required to include a code that indicates the resource group and NRS category for the episode. These are five-character strings called HIPPS (`Health Insurance Prospective Payment System`) codes. The logic for translating the resource group and NRS category to HIPPS codes is also presented in Table 1.

The structure of the HIPPS code as output by the Grouper is as follows:

- 1- The first position of the HIPPS code (see column in Table 1 called `HIPPS position`) is used to show the grouping step (coded using numbers 1, 2, 3, 4, or 5).
- 2- The second position of the HIPPS code shows the clinical severity level (using letter codes A, B, or C).
- 3- The third position of the HIPPS code shows the functional severity level (using F, G, or H).
- 4- The fourth position of the HIPPS code shows the services utilization level (using K, L, M, N, or P).
- 5- The fifth and final position of the HIPPS code shows the NRS payment category (using S, T, U, V, W, or X)¹.

Sources of Data

The grouper is designed to work with the Fall 2000, December 2002, and January 2008 revisions of the OASIS Data Set (see <http://www.cms.hhs.gov> for the OASIS data specifications, the latest of which is Version 1.60). The grouper can not produce classifications for episodes starting 1/1/2008 or later unless the most recent version of OASIS (1/2008) is used.

Which assessments will be grouped? CMS has directed that the Grouper assign a HIPPS code for assessments that meet all of the following three conditions:

1. Reason for Assessment (M0100) is equal to any of the following values:

¹Under Medicare billing instructions provided in Pub 100-04 (Medicare Claims Processing), Transmittal 1348 (October 5, 2007) per Change Request 5746, if no nonroutine medical supplies are provided during the episode, providers are instructed to replace the NRS codes with digits 1, 2, 3, 4, 5, and 6, respectively, before submitting the claim. As long as the correct format is used, the amount of payment for NRS is the same whether letters or numbers are used; receipt of payment is not contingent on whether the patient received NRS during the episode.

For assessments completed before 12/16/2002:

- 01 Start of care
- 02 Start of care, no further visits anticipated
- 03 Resumption of care following inpatient stay
- 04 Recertification
- 05 Other Followup

For assessments completed on or after 12/16/2002:

- 01 Start of care
- 03 Resumption of care following inpatient stay
- 04 Recertification
- 05 Other Followup

[Under the OASIS Burden Reduction initiative (effective 12/16/2002), RFA=2 assessments were dropped from the OASIS data collection protocol.]

AND

2. The therapy threshold item (M0825 or M0826) is NOT equal to NA.

This means that cases for which the HIPPS code is not needed will not be classified. (This would include, for example, assessments for non-Medicare/non-Medicaid patients, or Medicare assessments that are not the basis for casemix classification for a Medicare episode). It also means that Medicare assessments with M0825 or M0826 coded NA in error will not be classified. Records with M0825 or M0826 left blank WILL be classified, with that item treated as invalid data (see below).

AND

3. The assessment completion date (M0090) is a valid date on/after 7/19/1999.

The .DLL must have a valid date in order to decide which set of rules to use in computing the HIPPS code.

Which OASIS items will be used? The variables are shown in the pseudocode file (PSEU0203.PDF) and associated Appendix tables. Note that in addition to the grouping variables, some additional OASIS items are used by the Grouper to determine whether the case should be grouped, whether skip patterns affecting the casemix variables have been executed correctly, and whether the assessment conforms to consistency checks defined in the relevant OASIS Data Specifications. For assessments completed after 12/16/2002, some of these `skip-check` variables were no longer required on followup assessments (M0100, Reason for Assessment = 4 or 5).

How the Grouper Deals with Missing or Invalid Data

If the data for all grouping variables in a domain are complete and valid, the severity category for the domain is considered `computed.`

As noted previously, if one of the grouping variables shows an invalid value, that variable will not be used for grouping the episode, and the severity category for that domain will be considered `derived`, i.e., not based on complete information. An OASIS item value is invalid if it is any character

other than the characters that the relevant OASIS Data Specifications designate to represent a valid response for an assessment item. For many, though not all, items in the casemix grouper, a blank is an invalid value. Due to skip patterns and consistency checks, the validity of a response on a particular item may depend on the response(s) to other OASIS item(s).

The grouper will check the skip logic for most casemix items to determine if a response is valid or not. If the casemix item response is missing or invalid, or if the response on a skip-pattern precedent item or an item that is part of a consistency check for the casemix item is missing or invalid, the casemix item will be flagged as invalid and will not be used for casemix classification. The specifics of these data checks are detailed in the Grouper version 02.03 pseudocode.

The checks applied to the diagnosis-related OASIS items [M0230 (Primary Diagnosis ICD Code), M0240 (Other Diagnoses), M0246 (Payment Diagnoses)] are different from those in the OASIS Data Specifications. The Grouper's diagnosis requirements are discussed below.

When one or more domains of the HHRG is derived:

- for all episodes: a separate data validity flag output by grouper Version 02.0n will identify the type(s) of data problem(s):

DERIVATION OF THE DATA VALIDITY FLAG				
IF:				THEN:
MANIFESTATION_ SEQUENCING_ FLAG =	AND CLINICAL_DOMAIN_ DATA_ISSUE_FLAG =	AND FUNCTIONAL_DOMAIN_ DATA_ISSUE_FLAG=	AND SERVICE_DOMAIN_ DATA_ISSUE_FLAG=	DATA_ VALIDITY_ FLAG =
0	0	0	0	1
0	1	0	0	2
0	0	1	0	3
0	0	0	1	4
0	1	1	0	5
0	0	1	1	6
0	1	0	1	7
0	1	1	1	8
1	0	0	0	A
1	1	0	0	B
1	0	1	0	C
1	0	0	1	D
1	1	1	0	E
1	0	1	1	F
1	1	0	1	G
1	1	1	1	H

TABLE 1: Constructing the HIPPS code from Grouping Step and Point Scores for Episodes Starting 1/1/2008 or Later

	Definitions of Severity Levels by Grouping Step:					HIPPS Code			
	1st & 2nd Episodes		3rd+ Episodes		All Episodes	For this level:	Enter this value:	In HIPPS position:	
	0 to 13 therapy visits	14 to 19 therapy visits	0 to 13 therapy visits	14 to 19 therapy visits	20+ therapy visits				
	1	2	3	4	5				
Clinical Severity Level: <i>(by point scores - Pseudocode Appendix Table 5)</i>	0 to 4	0 to 6	0 to 2	0 to 8	0 to 7	C1	A	2	
	5 to 8	7 to 14	3 to 5	9 to 16	8 to 14	C2	B		
	9+	15+	6+	17+	15+	C3	C		
Functional Severity Level: <i>(by point scores - Pseudocode Appendix Table 5)</i>	0 to 5	0 to 6	0 to 8	0 to 7	0 to 6	F1	F	3	
	6	7	9	8	7	F2	G		
	7+	8+	10+	9+	8+	F3	H		
Services Utilization Level: <i>(by number of therapy visits)</i>	0 to 5	14 to 15	0 to 5	14 to 15	20+ (One group)	S1	K	4	
	6	16 to 17	6	16 to 17		S2	L		
	7 to 9	18 to 19	7 to 9	18 to 19		S3	M		
	10		10			S4	N		
	11 to 13		11 to 13			S5	P		
NRS - Supplies Severity Level: <i>(by NRS point scores- Pseudocode Appendix Table 7)</i>	NRS Points						NRS provided	no NRS provided	5
	0					NRS - 1	S	1	
	1 to 14					NRS - 2	T	2	
	15 to 27					NRS - 3	U	3	
	28 to 48					NRS - 4	V	4	
	49 to 98					NRS - 5	W	5	
	99+					NRS - 6	X	6	

- for episodes starting before 1/1/2008 - under grouper 02.0n, the fifth character of the HIPPS code will take the same value as the data validity flag to show which data problems are present for this episode.

Diagnosis codes. The diagnosis-based OASIS variables M0230 (Primary Diagnosis ICD Code), M0240b-f (Other Diagnoses: ICD Code), and M0245/M0246 (Payment Diagnoses: ICD Code) are used to classify episodes into Diagnosis Groups (DGs) based on a list of specific ICD-9-CM diagnosis codes (see Pseudocode Appendix Tables, Table 1 [and Table 6 for NRS²], in file PSEU0203_TABLES.XLS). Version 02.0n classifies episodes based on both primary and secondary diagnoses.

When a 3-digit ICD-9-CM code category appears in Tables 1 or 6, that category includes all 4- or 5-digit codes contained within it. Where 4-digit subcategories and/or 5-digit subclassifications are listed there, they must be entered on the assessment exactly as shown for the Grouper to award points.

VERSION NOTE - Version 02.03:

Because of the ICD-9-CM changes effective October 1, 2008, some 4-digit codes that are currently effective as casemix codes become invalid and are replaced with 5-digit codes that become effective as of that date. Codes that are valid through September 30, 2008, only are flagged in the Pseudocode Appendix Tables with a pound sign (#); those that become effective as of October 1, 2008, are flagged with an asterisk (*).

Note that when a code that was listed at the 3-digit level is replaced by code(s) listed at the 4- or 5-digit level, this may mean that some of the (other) codes included in the 3-digit category that were previously casemix codes are no longer recognized as casemix codes.

Data checks on diagnoses: The checks applied to the diagnosis-related OASIS items are different from those in the OASIS Data Specifications. The screens applied to these variables require:

1. that a primary diagnosis code is entered;

Range checks

2. that the primary diagnosis is not an E-code and that none of the characters to the left of the decimal point is non-numeric *other than* a V in a valid V-code in M0230_PRIMARY_DIAG_ICD and/or a V or an E in valid V- or E- codes in M0240_OTH_DIAGN_ICD);
3. that all the necessary digits are entered for any code which falls in a three-digit code family where, for Grouper purposes, CMS requires the 4th and/or 5th digit (e.g., 4th and/or 5th digit may be required to determine whether certain codes can be used for assigning the primary diagnosis);
4. that the diagnosis code used for casemix classification is a valid diagnosis code for the time period in which the assessment was completed (according to M0090_INFO_COMPLETED_DT, [Date Assessment Completed]);

²Note there is a completely separate set of diagnosis groups used to classify episodes for the purposes of NRS payment (NRS-DGs). The screens and processes used are parallel to those used for episode payment, so for ease of presentation, they are not described separately. However, the tables used for NRS classification will be noted.)

Sequencing checks

5. that a casemix diagnosis code which can only be entered as a secondary diagnosis according to ICD-9-CM coding guidelines is not entered as the primary diagnosis;
6. that a secondary-only or manifestation code casemix diagnosis (i.e., a diagnosis that requires multiple coding under ICD-9-CM coding rules) follow a complete and appropriate etiology or underlying condition code. (For purposes of Grouper logic checks, secondary-only or manifestation codes are those that appear flagged with an M in Tables 1 and 6 in the Pseudocode Appendix; complete³ and appropriate etiologies are defined for each manifestation code in Table 2, part 3, and Table 3 in the same Appendix.)

The Grouper software and other software written in accordance with the Grouper pseudocode cannot check the responses on these items against all possible ICD-9-CM diagnosis codes to assure that they are valid ICD-9-CM diagnosis codes; rather, they check for code validity only against lists of the codes used for casemix assignment.

V-codes and casemix diagnosis fields: In the fields for casemix diagnosis (M0246x3 and M0246x4), the Grouper:

1. will ignore E-codes and V-codes;
2. will acknowledge a diagnosis in column 3 in a given row ONLY if there is a V-code which potentially replaces a casemix diagnosis in the second column of that same row (for allowable V-codes, see Table 4 in the Appendix); and
3. will acknowledge a diagnosis in column 4 of a given row ONLY if:
 - (a) there is a Table 4 V-code in the second column of that same row; AND
 - (b) the code in column 4 is a secondary-only code or other code that requires a preceding etiology or other code first situation (as defined in Pseudocode Appendix Table 1: Diagnosis Codes, Secondary-only Diagnosis Codes, Diagnosis Groups, And Diagnosis Group Numbers; AND
 - (c) the code in column 3 is defined in Pseudocode Appendix Table 3 as an appropriate etiology for the manifestation code entered in M0246, column 4.

Special treatment of casemix V-codes: In Version 02.0n, several V-codes (V55.0, V55.5 and V55.6) are casemix diagnoses, that is, they can earn points for an episode. (See Tables 1, 5, 6, and 7 in the Appendix.) These codes are treated specially for sequencing and scoring purposes: If one of these three V-codes appears in M0230a or M0240x, the Grouper will not score any entries in M0246x3 and M0246x4 on the same row.

Note that columns 3 and 4 (M0246x3 and M0246x4) in item M0246 are optional; entering of a V-code in M0230/M0240 does not require that columns 3 and 4 be completed on that row.

Scoring multiple diagnoses: Diagnoses are treated differently for scoring purposes in Grouper 02.0n than in earlier versions. Every valid casemix

³Under the Grouper logic, if a potential etiology is also a potential casemix code (Table 1), it is evaluated according to the specificity requirements for casemix codes (Table 2, Part 1). If it fails to meet those criteria, it will be flagged as incomplete for all purposes, and any manifestation code that follows it will not be recognized for scoring purposes. Codes in this situation are marked with a plus sign (+) in Table 2, Part 3.

diagnosis code that is reported has the opportunity to earn points for classification purposes. (In Grouper versions 1.0n, an episode could earn points for the primary diagnosis only.) However, the episode can earn the points for a diagnostic group only once (even if several of its diagnoses fall in the same group.) If the primary diagnosis and one of the other diagnoses fall into a diagnostic group where there are separate numbers of points to be earned for primary and other diagnosis (e.g., diabetes), the episode will receive only the points due for a primary diagnosis.

There are some scoring conditions (see Table 5 in the Appendix, rows 6, 10, 11, 14, 19, 20, and 27) that involve multiple diagnosis groups. The pseudocode illustrates the Grouper software's logic for dealing with the need to score the conditions without awarding the points more than once even though multiple qualifying diagnoses may be present. Users are encouraged to review these sections.

Scoring when a manifestation code and its etiology each potentially earn points in different diagnosis groups: Finally, if a manifestation and its appropriate etiology each potentially earn points in separate diagnostic categories, only the code earning the higher number of points for the episode is recognized and scored. This contention will be decided based on the total number of points earned by each diagnosis, including points earned based on the presence of coexisting conditions within the episode. (In cases of a tie, the etiology will be recognized and scored.) As noted above, if an episode has earned points in a diagnosis group once, it cannot earn them again via another lower-listed diagnosis. However, if the first occurrence of the diagnosis did not earn the points in its diagnosis group because it was the losing contender in etiology/manifestation contention, any lower occurrence of another diagnosis code in the same (losing) diagnosis group COULD potentially earn those points for the episode. The pseudocode illustrates the Grouper's specific logic for dealing with these situations and users are encouraged to review these sections.

The set of ICD-9-CM diagnosis codes valid for submission on home health claims is usually updated each Federal fiscal year (as of October 1). The diagnosis codes used for grouping must be valid at the time of assessment (based on assessment completion date, M0090). A diagnosis code that is identified as invalid on the M0090 date (i.e., the code is not included in the applicable Federal fiscal year's listing of valid ICD-9-CM codes) will not earn points. However, if a currently valid 4-digit casemix diagnosis code is encountered with an extra digit appended to it (e.g., it is `embedded` in a 5-digit code that is not valid until a later fiscal year), the extra digit will be ignored by the Grouper and the code WILL be scored based on the 4-digit code - even though the 5-digit code itself is not yet valid.

The Claim-OASIS Matching Key

The format of the 18-character claim-OASIS matching string (entered in the Treatment Authorization field on HHA claims) has also been modified for Version 02.0n due to changes in the classification algorithm. This string is now used on the Medicare claim not only (a) to identify the specific OASIS assessment used to generate the HIPPS code, but also (b) to store OASIS information needed to generate a corrected HIPPS code as required based on corrections to certain classification variables during claims processing. In order to fit all the necessary information into the same 18 characters, many of the variables are transformed into alphanumeric codes (letters) in order to use the fewest

possible characters. Because the new information contained in this string may be needed for calculating payment, its presence on the claim in a valid format will now be required for episode claims to be paid.

The general logic for reporting information in the 18-character claim-OASIS matching string is illustrated by the example below; the conversion values⁴ are shown in Table 8 in the Pseudocode Appendix.

#	Position	Definition	Format
1	1-2	M0030__YY (<i>digit year from M0030</i>)	99
2	3-4	M0030__DATE_CODE (<i>alpha code for date MMDD from M0030- see Table 8</i>)	XX
3	5-6	M0090__YY (<i>2 digit year from M0090</i>)	99
4	7-8	M0090__DATE_CODE (<i>alpha code for date MMDD from M0090 – see Table 8</i>)	XX
5	9	M0100 (<i>1-digit format: 1, 3, 4, or 5</i>)	9
6	10	M0110 (<i>Episode timing: 1 [early or UK] or 2 [late]</i>)	9
7	11	CLIN_SCORE1_CD (<i>alpha code for clinical severity points under Equation 1</i>)	X
8	12	FUNC_SCORE1_CD (<i>alpha code for functional severity points under Equation 1</i>)	X
9	13	CLIN_SCORE2_CD (<i>alpha code for Clinical severity points under Equation 2</i>)	X
10	14	FUNC_SCORE2_CD (<i>alpha code for Functional severity points under Equation 2</i>)	X
11	15	CLIN_SCORE3_CD (<i>alpha code for Clinical severity points under Equation 3</i>)	X
12	16	FUNC_SCORE3_CD (<i>alpha code for Functional severity points under Equation 3</i>)	X
13	17	CLIN_SCORE4_CD (<i>alpha code for Clinical severity points – under Equation 4</i>)	X
14	18	FUNC_SCORE4_CD (<i>alpha code for Functional severity points – under Equation 4</i>)	X

TECHNICAL DOCUMENTATION FOR THE GROUPER .DLL

This documentation describes the .DLL which can be used to calculate HIPPS codes from OASIS-B1 (08/2000, 12/2002, or 1/2008) data.

GROUPER.DLL is a Win32 Dynamic Link-Library written in Microsoft Visual C++ 6.0 and defined using a module-definition (.DEF) file. When installed, it can serve as a shared library that can be used simultaneously by applications written in 32-bit environments such as C++ or Visual Basic 6.0.

This is the definition exported from GROUPER.DLL. It contains the single function, `process_record_v201`:⁵

Microsoft (R) COFF Binary File Dumper Version 6.00.8447
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Dump of file grouper.dll

File Type: DLL

Section contains the following exports for grouper.dll

0 characteristics

⁴Note that the letter code for each specific calendar date is the same whether or not the year is a leap year.

⁵The function was not updated for Grouper version 02.03.

```
48AC6F03 time date stamp Wed Aug 20 15:22:43 2008
      0.00 version
      1 ordinal base
      1 number of functions
      1 number of names
```

```
ordinal hint RVA      name

      1      0 000010B9 process_record_v201
```

Summary

```
D000 .data
1000 .idata
6000 .rdata
9000 .reloc
B2000 .text
```

The .DLL accepts an input string in the standard OASIS HAVEN 1448-byte record format and returns a 5-character HIPPS value, an 18-character claim-OASIS matching key, a GROUPER version number (currently `02.03`), and a data validity flag.

The ZIP file containing the software and this documentation may be distributed and you may freely use and distribute the .DLL in your applications.

Parameters used by the .DLL:

```
Input:      A string that consists of the standard OASIS HAVEN 1448-byte
            record (OASIS B1 [08/2000 or 12/2002 or 1/2008] format)

Output:     Four character strings:

            the HIPPS code (XXXX9) or BLANK
            the .DLL version code (XX.XX, currently 02.03) or BLANK
            the claim-OASIS matching key (99XX99XX99XXXXXXXXXX) or BLANK
            the data validity flag (X) or BLANK
```

Running the Demo Programs

C++: TESTDLL.EXE is a C++-based application that reads sample OASIS data from a test file in the CMS standard HAVEN 1448-byte text format and writes the output to a text file named OUT.TXT. The output record will contain a record sequence number, the calculated HIPPS value, the claim-OASIS matching key, the Grouper.DLL version code, and data validity flag. The directory in which you wish to run the demo must contain all three necessary files:

```
TESTDLL.EXE
GROUPER.DLL
TESTDATA203_PT1.TXT (or your own test data).
```

To generate the .DLL's code assignments from the test file (or from YOUR test data):

1. Make sure that all the related files are in the same directory.
2. Execute the following statement (using the RUN command under Windows, or at the DOS prompt):

(path)TESTDLL [datafilename] [NN - optional]

where:

[datafilename] is the name of this test file or YOUR test data, and

[NN] is the number of records you wish to have processed from that file. If no value is entered, the program will process all the records in the file, up to a maximum of 32,000.

For example, C:\GROUPER\TESTDLL TESTDATA203_PT1.TXT 10 would process the first 10 records of the test data file, TESTDATA203_PT1.TXT, contained in directory C:\GROUPER.

For OASIS records that are not appropriate for HIPPS coding (e.g., M0100_ASSMT_REASON other than 01-05 (and for assessments completed after 12/16/2002, M0100_ASSMT_REASON other than 01, 03, 04, or 05), or M0825_THERAPY_NEED = NA or M0826_THER_NEED_NA = 1), the .DLL (and TESTDLL.EXE) outputs blanks for all of the output elements (HIPPS code, claim-OASIS matching key, .DLL version code, data validity flag). This is also the case when the date the assessment was completed (M0090) is not a valid date on or after 7/19/1999.

Visual Basic: VBDLL.EXE is a Visual Basic 6.0 application with a similar function -- it reads sample OASIS data from a test file in the CMS standard HAVEN 1448-byte text format and writes the outputs to a text file it calls VBOUT.TXT. The output record will contain a record sequence number, the calculated HIPPS value, the Grouper.DLL version code, the claim-OASIS matching key, and the data validity flag.

The directory in which you wish to run the demo must contain all three necessary files:

VBDLL.EXE
GROUPER.DLL
TESTDATA203_PT1.TXT (or your own test data).

To generate the .DLL's code assignments from the test file (or from YOUR test data):

1. Make sure that all the related files are in the same directory.
2. Click on the VBDLL.EXE icon to run the program (or use the RUN command under Windows).
3. Enter the test file name in the left entry window and the number of records to be processed in the right entry window, and click on `Go`.

4. The program will indicate the number of records processed and the file to which the outputs were written (VBOUT.TXT). If an invalid data file name is entered, an error message will appear.

As with the C++ program, when records are not appropriate for HIPPS coding (e.g. M0100_ASSMT_REASON other than 01-05 (and for assessments completed after 12/16/2002, M0100_ASSMT_REASON other than 01, 03, 04, or 05), M0825_THERAPY_NEED = NA or M0826_THER_NEED_NA = 1, or when the date the assessment was completed (M0090) is not a valid date on or after 7/19/1999), the program will write out blanks for the output elements (HIPPS code, .DLL version code, claim-OASIS matching key, data validity flag).

Calling GROUPER.DLL from C++

The demo application (TESTDLL.EXE) illustrates the use of the .DLL from a C++ application. (The file TESTDLL.CPP shows the source code). Note to include the Grouper header file GROUPER.H. GROUPER.DLL contains a function:

```
'void process_record_v201(char *out, char *in, char *oasis, char *version, char *invflag)'
```

Include the grouper.lib library when linking the program and importing is not necessary.

All strings should be initialized with sufficient space, as process_record_v201 does not perform memory management.

Calling GROUPER.DLL from Visual Basic

The demo application (VBDLL.EXE) illustrates the use of the .DLL from Visual Basic 6.0. (The file VBDLL.FRM shows the source code.)

To access Grouper from VB, import a single Sub (i.e., void function) from the GROUPER.DLL library with an ordinary `declare` statement. This function should be called `process_record_v201`, and should accept as arguments 5 ByVal Strings, of which one is input and four are output, as above. Example:

```
Private Declare Sub `process_record_v201` Lib `grouper.dll` (ByVal a As String, ByVal b As String, ByVal c As String, ByVal d As String, ByVal e As String)
```

Functionality is identical to the C++ version. If the second argument is an eligible OASIS HAVEN record, then the first, third, fourth, and fifth argument strings are modified as above; if the record is ineligible, the function outputs blanks.

Also as above, the function should be called with fixed-length or pre-initialized strings of adequate length, since the procedure itself performs no memory management. The upper case in the function name must not be omitted; this is how the DLL distinguishes between VB and C++ calling-convention versions of the function.

Implementing Version 02.03

Ideally, users should install the new version of GROUPER.DLL (Version 02.03) as soon as possible. While the bulk of changes under this version are the ICD-9-CM

changes which are effective October 1, 2008, the other changes are effective immediately.

Providers who are using vendor-supplied software will need to consult with their vendors on the appropriate course of action. If the vendor integrated the GROUPER.DLL into its software, then that software will need to be modified to incorporate the updated GROUPER.DLL; the vendor will have to tell the provider how this will be accomplished. If your vendor developed its OWN grouping routine based on the pseudocode provided, they will need to update it to incorporate the changes described above.

=====

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VERSION NOTES for OLDER GROUPER VERSIONS:

SUMMARY OF CHANGES INCORPORATED IN VERSION 02.02 (1/16/2008)

This 1-16-2008 version of the Grouper .DLL software incorporated a number of corrections and improvements over the previous version (11-15-2007). These include the following:

1. Computes correct score when the primary diagnosis for the assessment is found in M0246 and another diagnosis code in the same diagnosis group as the primary diagnosis is entered in M0240.
2. Computes correct score for nonroutine medical supplies(NRS) on recertification and followup assessments (M0100 = 04 or 05) when skin items (M0440 ff) are involved.
3. Turns on the manifestation sequencing flag when a manifestation code is entered in M0246, column 3.
4. Identifies 26 additional diagnosis categories as incomplete at the 3-digit level (added to Table 2, part 1).

VERSION NOTES for OLDER GROUPER VERSIONS

SUMMARY OF CHANGES INCORPORATED IN VERSION 02.01 (11/15/2007)

I. GROUPER.DLL:

As noted above, Grouper 02.01 implemented a completely new grouping algorithm, based on the HHA PPS refinements described in the Notice of Proposed Rulemaking (NPRM), CMS-1541-P, published in the Federal Register on May 4, 2007, and the Final Rule, CMS-1541-FC, published on August 29, 2007. The changes are so sweeping that the changes cannot be listed out individually. The filename is still `GROUPER.DLL`.

II. RELATED FILES

1. The pseudocode file (PSEU0201.PDF) was modified to reflect the changes in the GROUPER.DLL, version 02.01, as described above. The diagnosis code and scoring tables became so large under version 02.01 that they were moved to a separate Appendix file.
2. The versions of VBDLL.EXE (and its source code VBDLL.FRM) and the C++ test program TESTDLL.EXE (and its source code TESTDLL.CPP) have been updated to refer to version 02.01 (e.g., `PROCESS_RECORD_V201`).
3. The test data have been expanded to over 50,000 records in order to include additional data scenarios, and split into two files: TEST201_PT1.TXT and TEST201_PT2. To support testing of grouping earlier assessments, the existing test data file of episodes before 1/1/2008 (TEST106D.TXT) is also retained.

VERSION NOTES for OLDER GROUPEL VERSIONS

SUMMARY OF CHANGES INCORPORATED IN VERSION 01.06 (9/15/2006)

I. GROUPEL.DLL:

Version 1.06 implements the FFY07 ICD-9-CM code updates. For assessments with completion dates October 1, 2006 or later, the following codes are invalid: 323.0, 323.4, 323.5, 323.6, 323.7, and 323.8. They have been replaced by the following more detailed codes: 323.01, 323.02, 323.41, 323.42, 323.51, 323.52, 323.61, 323.62, 323.63, 323.71, 323.72, 323.81, and 323.82. Version 1.06 will give points for the old codes for cases with a valid assessment completion date (M0090) 7/19/1999 through 9/30/2006; records with assessment dates on or after 10/1/2006 that bear the dropped diagnosis codes will have the clinical domain score flagged as derived. Note that records with assessment dates before 10/1/2006 that include the new codes will NOT show the clinical domain flagged as derived and will not receive any points for casemix classification.

As noted above, Version 01.06 also recognizes that, as of June 21, 2006, the OASIS data collection protocol was updated (to version 1.50) and certain inconsistencies were converted from warnings to fatal errors. Three such changes that impact wound-related variables already included in the grouping logic were added to the Grouper .DLL:

- (1) If any pressure ulcers can be assigned a stage (M0450), the stage of the most problematic ulcer must be reported (M0460).
- (2) Similarly, if any stasis ulcers can be observed (M0470), the status of the most problematic stasis ulcer must be reported (M0476).
- (3) If any observable surgical wounds are reported (M0484), the status of the most problematic wound (M0488) must also be reported.

III. RELATED FILES

4. The pseudocode file (PSEU0106.PDF) was modified to reflect the changes in the GROUPEL.DLL, version 01.06, as described above.

5. The versions of VBDLL.EXE (and its source code VBDLL.FRM) and the C++ test program TESTDLL.EXE (and its source code TESTDLL.CPP) have been updated to refer to version 01.06 (e.g., `PROCESS_RECORD_V106`).

6. The test data file has been expanded to 2930 records in order to include additional data scenarios and to include records dated both before and after 6/21/2006 (effective date of version 1.50 of the OASIS data specifications) and before and after 10/1/2006 (effective date of FFY07 ICD-9-CM updates). It has been renamed TEST106D.TXT.

VERSION NOTES:

SUMMARY OF CHANGES INCORPORATED IN VERSION 01.05 (7/2/2003)

I. GROUPEL.DLL:

1. Version 01.05 recognizes that as of 10/1/2003, V-codes are allowed in OASIS item M0230 (Primary Diagnosis ICD Code). Optional item M0245 (Payment Diagnosis) should be left blank unless the assessment is being used to generate a HIPPS code and a V-code is reported in place of a casemix diagnosis in M0230. In that case, the .DLL calculates the HIPPS code based on any diagnosis codes entered in M0245; M0240b (Other

Diagnosis 1: ICD Code) is ignored for purposes of HIPPS code calculation. The same validity screens applied to diagnosis codes listed in M0230 and M0240b are applied to M0245a and M0245b, respectively, except that V-codes are not allowed in M0245.

2. Version 01.05 also recognizes updates to the ICD-9-CM codes for federal fiscal year (FFY) 2004. As of October 1, 2003, 331.0 and 358.0 are no longer valid diagnosis codes; 331.11, 331.19, 331.82, 358.00, and 358.01 are valid codes that will earn casemix points for assessments completed on or after that date.
3. Version 01.05 recognizes that the ICD-9-CM protocol for coding fractures with crushing injury is changed as of October 1, 2003 such that the crushing injury diagnosis code (925-929) is to be listed before the fracture code. For records with M0090 (Assessment Completion Date) on or after 10/1/2003, the fracture casemix diagnosis codes (800-825, 827-828) and intra-cranial injury casemix diagnosis codes (851-854) will increase the clinical domain score when they appear as the first secondary diagnosis (M0240b; M0245b if applicable) but only if the primary diagnosis is a crushing injury (925-929).

Note that when these fracture and intra-cranial injuries are not due to crushing injuries, these codes will continue to earn casemix points as before if they qualify as the primary diagnosis; similarly, the crushing injury codes 927-928 will continue to earn points if they qualify as the primary diagnosis.

4. The Version 01.05 .DLL software incorporates a few minor corrections, and the pseudocode incorporates a few changes to have it match the .DLL more precisely:

> Previously, an error in M0650 OR M0660 activated the data validity flag but casemix points were earned if either item had a valid, point-earning value. Version 01.05 recognizes that these are two independent items and if one of these items shows a valid value that earns points, a problem with the other will no longer activate the validity flag for records with an assessment completion date (M0090) of 10/1/2003 or later. The .DLL has been modified.

> Previously, a problem with either M0450_NBR_PRSULC_STG3 (Number of Stage 3 pressure ulcers) or M0450_NBR_PRSULC_STG4 (Number of Stage 4 pressure ulcers) activated the data validity flag but casemix points were also earned. Version 01.05 recognizes that these two items are inter-related, and used for logic-testing other items. Therefore, for records with an assessment completion date (M0090) of 10/1/2003 or later, if there is a problem with either of these items, the validity flag will be activated and no points will be earned. The .DLL has been modified.

> Previously, records in the burns/trauma diagnosis group were treated slightly differently from records in the other three diagnosis groups. Specifically, if a record had a wound or lesion (M0440_LESION_OPEN_WND, [Has Skin Lesion or Open Wound] = 1), and a valid burns/trauma diagnosis in M0230 but an invalid value in M0240b, the data validity flag was activated but the casemix points were also earned. Version 01.05 recognizes that the two diagnosis codes are inter-related, and used jointly for logic testing. Therefore, for records with an assessment

completion date (M0090) of 10/1/2003 or later, if there is problem with either of the two diagnosis codes, the validity flag will be activated and no points will be earned. The .DLL has been modified.

II. PSEUDOCODE (PSEU0105.PDF)

7. The pseudocode file (PSEU0105.PDF) was modified to reflect the changes in the GROUPER.DLL, version 01.05, as described above.
2. In addition, the pseudocode did not previously include a logic test on M0250 (Therapies Received at Home) that would activate the data validity flag if all responses (including `none of the above`) were checked `no` (=0). However, in such cases, the .DLL activated the data validity flag and no casemix points were earned. The pseudocode has been updated to include this check (which the .DLL was already performing).

IV. RELATED FILES

1. The versions of VBDLL.EXE (and its source code VBDLL.FRM) and the C++ test program TESTDLL.EXE (and its source code TESTDLL.CPP) have been updated to refer to version 01.05 (e.g., `PROCESS_RECORD_V105`).
2. The test data file has been expanded to 2762 records in order to include additional data scenarios and to include records dated both before and after 10/1/2003. It has been renamed TEST105D.TXT.

VERSION NOTES:

SUMMARY OF CHANGES INCORPORATED IN VERSION 01.04 (9/20/2002)

I. GROUPER.DLL:

1. Version 1.04 evaluates the input record on assessment completion date (M0090). If the date is not valid and equal to 7/19/1999 or later, it outputs blank values for all output variables.

>> IF M0090 contains a valid date from 7/19/1999 through 12/15/2002, version 1.04 operates the same as version 1.03, grouping the same types of records and applying the same logic and range checks.

>> IF M0090 contains a valid date on or after 12/16/2002, Version 1.04 operates the same as version 1.03 for records where M0100 (reason for assessment)= 1 or 3.
 - > For records where M0100 = 2, version 1.04 outputs blank values in all output variables.
 - > For records where M0100 = 4 or 5, version 1.04 applies a reduced set of logic and range checks, omitting those which relied on `skip-check` items that were dropped as part of the OASIS Reduced Burden initiative (M0445, M0468, M0482, M0520).
2. Version 1.04 also recognizes an update to the ICD9-CM code set for federal fiscal year (FFY) 2003. As of October 1, 2002, 357.8 is no longer a valid code and is replaced by three more detailed codes: 357.81, 357.82, and 357.89. Version 1.04 will give points for a primary diagnosis of 357.8 for cases with a valid assessment completion date (M0090) 7/19/1999

through 9/30/2002; records with assessment dates on or after 10/1/2003 will receive points only for codes 357.81, 357.82, and 357.89.

3. Version 1.04 incorporates a few minor corrections - e.g., an incomplete code of 713, while it received no points, did not trip the data validity flag; now it does. Also, there is a more specific screen for E-codes (which are still not permitted under the OASIS data collection protocol) and the pseudocode has been expanded to match more precisely the screens for E-codes and V-codes that are actually incorporated in the .DLL itself.

NOTE: Version 1.04 of the grouper does not address M0245, a new OASIS item that will be activated as of October 2003.

II. PSEUDOCODE (PSEU0104.PDF)

8. Pseudocode file (PSEU0104.PDF) was modified to reflect the changes in the GROUPER.DLL, version 1.04 as described above.

V. RELATED FILES

3. The versions of VBDLL.EXE (and its source code VBDLL.FRM) and the C++ test program TESTDLL.EXE (and its source code TESTDLL.CPP) have been updated to refer to version 1.04 (e.g., `PROCESS_RECORD_V104`).
4. The test data file has been expanded to 1950 records in order to include additional data scenarios and to include records dated both before and after 12/16/2002. It has been renamed TEST0104M.TXT.

VERSION NOTES: SUMMARY OF CHANGES INCORPORATED IN VERSION 01.03 (8/31/2000)

I. GROUPER.DLL:

1. M0230: When an OASIS record included the 4th or 5th digits of an ICD-9-CM diagnosis code that was listed in the PPS Final Rule as one that could be submitted with only 3 digits, version 01.02 treated the code as invalid and did not assign casemix points. Version 01.03 will allow the submission of the 4th and 5th digits.
2. M0445: Version 01.02 incorrectly classified the clinical domain as containing an invalid data item if M0445 had a value of zero (`no`) and items M0440 thru M0488 were not blank. Version 01.03 verifies only that M0445 is consistent with the nature of the entry in M0450 (i.e., if M0450 is not equal to 0 through 4, M0445 must not be equal to 1; if M0450 is equal to 0 through 4, M0445 must be equal to 1).
3. M0530/M0540/M0550: Version 01.02 did not implement the inter-item logic checks on these items prescribed by the OASIS submission guidelines, version 1.10. These checks involve items M0520 and M0100. Version 01.03 implements these checks (as shown in the pseudocode) and flags the domain as invalid if any of the items fail these screens.
4. M0610: If version 01.02 found a valid response on any of the component response categories to M0610, it coded the item as valid even if other responses were invalid values. Version 01.03 flags the domain as invalid if any response category for M0610 has an invalid response.

II. PSEUDOCODE (PSEU0103.PDF)

1. For version 01.03, a correction to the claim-OASIS matching key has been made. Version 01.02 of the pseudocode originally indicated that the format for this string was MMDDYYYYMMDDYYYY99; the correct format is YYYYMMDDYYYYMMDD99.
2. The validity tests in the 6/30/2000 version of the pseudocode treated `00` as a valid response for items M0460, M0476, and M0488. In fact, the lowest valid value for these items is `01.` Version 01.03 reflects this.

VI. RELATED FILES

5. The versions of VBDLL.EXE (and its source code VBDLL.FRM) distributed in HHRG0102.EXE included an incorrect reference to PROCESS_RECORD_V103. For version 01.03, this reference is correct.
6. The 1000-record test data file distributed with HHRG0102.EXE (TEST0102.006) has been modified slightly to illustrate additional data scenarios, and has been renamed TEST0103.001