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ICPSR 34969

# Survey of Midlife in Japan (MIDJA): Biomarker Project, 2009-2010

MIDUS-MIDJA Biomarker Medication Documentation

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**Survey of Midlife in Japan (MIDJA): Biomarker Project, 2009-2010**

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# DOCUMENTATION
# for
# MIDUS & MIDJA
# MEDICATION DATA

**University of Wisconsin ♦ Institute on Aging**

**June 2016**

## INTRODUCTION

This document provides an overview of protocols used to process several types of medication data obtained during the MIDUS and MIDJA clinic visits. In particular it describes protocols used to 1) enhance data about individual medications via linkage to generic names and then to therapeutic and pharmacologic classes in the Lexicomp® Lexi-Data database, and 2) code text data about reasons for taking medications. This document also provides information about the creation and usage of related administrative and constructed variables.

Data users are also encouraged to review the README and DataFile Notes documentation files created for each wave of MIDUS and MIDJA Biomarker data collection. These documents provide information about naming conventions, administrative and filter variables, and the order in which variables appear in the data file. They also include information about how missing values are handled and other issues that arose over the course of a given study.

This document will be periodically revised and updated as more information is gathered, and researchers continue to work with the MIDUS and MIDJA data. If there are suggestions or comments, please contact Gayle Love (glove@wisc.edu) or Barry Radler (bradler@wisc.edu).

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## SECTION A

# OVERVIEW OF MEDICATION DATA PROCESSING

## OVERVIEW OF MEDICATION DATA PROCESSING

The MIDUS and MIDJA Biomarker Clinic Visits include collection of comprehensive information about medications of all types, as well basic information about allergic reactions to any type of medication. Respondents were instructed to bring all their medications, or information about their medications, to the clinic visit to ensure that information about those medications was recorded accurately. Study specific details about collection of medication data along with copies of the culturally appropriate medication charts can be found in (MIDUS_P4 Medication Documentation & MIDJA_ Clinic Visit Documentation). The current document describes general protocols applied to both studies thus references to both studies are included throughout. In the U.S. medications are classified into three groups (prescription, over-the-counter – OTC, alternative - ALT). In Japan prescription medications include herbals which are often prescribed by physicians while OTC and ALT medications are categorized as "Quasi" medications. In general these categories include the following:

- Prescription Medications:
    - U.S. - All FDA approved medications prescribed by someone authorized/licensed under the Western medical tradition, typically a physician.
    - Japan – medications prescribed by individuals authorized under Japanese law to prescribe Western and/or Eastern/Chinese traditional medicine.
- Quasi medications: include all medications in the following categories
    - *Over the Counter Medications*: Include vitamins, minerals, non-prescription pain relief, antacids, anti-diarrheals, fiber, lubricating eye or nose preparations etc. that the subject uses regularly and can be purchased "Over the Counter" (OTC) without a prescription.
    - *Alternative Medications:* Include herbs, herbal blends (not including herbal teas), homeopathic remedies, and other alternative remedies. These may be purchased over the counter or they may be "prescribed" by a health care practitioner trained in a non-western tradition.

The following information is obtained for each medication regardless of type:

- Medication name, dosage, and route of administration
- How often the medication is taken (frequency)
- How long the participant has been taking a given medication
- Why they think they are taking the medication

After basic cleaning protocols have been completed (i.e. value ranges and skip patterns checked, data entry errors corrected, missing values specified etc.) standardized protocols are applied to both MIDUS and MIDJA medication data to:

- Link medications first to Generic Names and then to therapeutic and pharmacologic class information from the Lexicomp® Lexi-Data database
- Code text data describing reasons why participants think they are taking a given medication

The remainder of this document describes data file characteristics and protocols for completing the above tasks.

**Data File Characteristics**

The medication data are released in the traditional flat (wide) format as part of the larger MIDUS/MIDJA aggregate data files to facilitate their use in standard between person analyses. Details about the variables in those files are included in the documentation for those larger data sets (see MIDUS_P4 Medication Documentation & MIDJA_ Clinic Visit Documentation). The scope of the medication data however also lends itself to within person analysis of medication use, thus the medication data are also released in a standalone stacked (long) format. This stacked file is the focus of this document. The stacked file only contains data about medications used, thus it does not include any information about study participants who do not take any medications. It also does not include any data about medication allergies. This section describes the variables and variable naming conventions for the *stacked* files.

Note, this is relatively new data and thus release of the data files along with appropriate documentation is staggered and some files may not be available publicly as yet. Questions about file availability should be directed to Gayle Love (glove@wisc.edu) or Barry Radler (bradler@wisc.edu).

*Variable Naming Conventions:* MIDUS and MIDJA variable naming conventions (see the Naming and Coding Conventions documentation for MIDUS & MIDJA) specify that the first 3-4 characters of each variable name will identify the longitudinal wave in which the data were collected, the specific project, and the data type or method used to collect the data. The variable names for the Medication data have the following general format **a(a)bc** where:

**a(a)** = MIDUS wave 2 (**B**) or Refresher (**RA**, pending) or MIDJA wave 1 (**J**) or 2 (**K**)
**b** = Biomarker Project (**4** - MIDUS; **2** - MIDJA)
**c** = Medication data (**X** - MIDUS; **M** - MIDJA)

For example, J2M__ indicates a MIDJA wave 1 Biomarker medication variable, while B4X__ indicates a MIDUS wave 2 Biomarker medication. Throughout the remainder of this document, unless otherwise noted, a '__' in front of a variable name is a place holder for these unique character sets indicating the study and wave.

***Variables in Stacked File.*** The stacked file is created in SPSS by transposing the original flat

medication file, thus it includes the same set of information reported for each medication, but is organized so that each row represents a single medication. The file also contains a number of other (administrative/flag, therapeutic and pharmacologic class code) variables that are not included in the flat files. These are described below or in later sections as noted. Variables that are unique to MIDUS or MIDJA or a particular wave of data collection are noted as appropriate.

Administrative/Flag Variables. The following administrative variables appear first in the file and can be used to facilitate linkage of the individual medications back to the larger Biomarker and other MIDUS or MIDJA datasets.

**ID#** - project specific ID number (i.e. MIDJA_IDs, M2ID, MRID)

**__TM,** – the Total number of medications the participant is taking. This variable will have a value of at least 1 for all cases as the stacked file only includes data for those individuals taking at least one medication.

**__TM, __PM, __OM, __AM, __QM** – these variables indicate the number of Prescription, OTC, ALT, or Quasi medications that the participant is taking.

**__INDEX** – this variable is used in combination with the ID variable to transpose the stacked file back to the flat format. It is created by SPSS when the original flat file is transposed to create the stacked file. The values for this variable are the variable names for the medication name variables from that original flat file.

The following administrative variables are found only in MIDUS:

**M2FAMNUM** – MIDUS 2 family number

**SAMPLMAJ** – MIDUS major sample identifier

Note, with the exception of the __INDEX variable, the administrative variables are not unique to a given medication, rather they apply to all medications for a given individual. If the file is sorted by the ID variable, then the values for the above variables will be the same for all medications having a given ID#.

The next set of variables corresponds to the standardized set of variables reporting dosage, frequency of use, how long taken, and reasons for taking for a given medication in the flat file (see MIDUS_P4 Medication Documentation & MIDJA_ Clinic Visit Documentation). These variables were used to create the following set of flag variables which can be used to select subsets of cases for inclusion in analysis.

**__TYPE** – categorical variable indicating medication type (Prescription, OTC, ALT, or QUASI)

**__MT** – categorical variable indicating whether or not the medication name reported by the participant was matched to a Lexi-Data Generic Medication Name (see below).

This variable has 3 codes

1 = Matched with the Lexion

2 = UnMatched Medication

3 = UnMatched, Insufficient Info

**__DUP** – categorical Yes/No variable indicates whether a participant is taking more than one Prescription medications with the same Generic Name. There are two circumstances in which a medication is coded 'Yes' for this variable:

- A medication is taken regularly, and also on an as needed (PRN) basis. This occurs most often for pain or allergy relief medications.
- An individual takes two medications with different brand names but the same Generic Name (e.g. Albuterol and Proventil; Actiq and Duragesic).

**__VAR** – categorical Yes/No variable used to flag medications that are taken in variable amounts. For example, some medications are taken in different amounts on alternate days or at different times of day.

**__PRN** – categorical Yes/No variable indicates whether a medication is taken on an 'as needed' (PRN) basis.

- Such medications are often taken just once at any given time as needed, in those instance the frequency variables (__F, __FU) will have the values 1 and 5=As Needed (PRN)), respectively.
- Sometimes respondents will provide additional details (i.e. 4 times a day, 1 time per week). In those instances, the variables (__F, __FU) will reflect the actual usage (e.g., be recorded as 4 and 1=Day, 1 and 3=Week, respectively).

MIDUS Only flag variables:

**__CMB** – categorical Yes/No variable indicating whether a medication contains two or more active ingredients. Due to differences in how dosage data was reported information about use of combination medications (i.e. medications with 2 or more active ingredients) was easily documented in MIDUS. In MIDJA however, dosage for such medications was typically reported in terms of the number of pills, tablets, etc. taken thus this variable is only created for MIDUS.

**__CSA** – is a categorical variable indicating the Federal Control Status for a given medication. In other words at what level, if at all, is it considered a controlled substance under the U.S. Controlled Substances Act at the time that the linkage was made. This classification was extracted from the Lexi-Data via linkage to the generic medication name, thus UnMatched medications are INAPP for this variable along with some alternative medications that have not been classified as yet. Since this reflects U.S. Federal Standards which may be different in Japan, this variable is not created for MIDJA.

The final set of variables in the stacked files are therapeutic and pharmacologic class codes created after the MIDUS/MIDJA medication data were linked to the Lexi-Data database. Details about these variables and the linking process are provided below in Section B.

**Coding Open-Ended Text**

The medication data includes code variables for two types of open-ended text responses: 1) Responses to the question “Why are you taking it?” were recorded verbatim for each medication and 2) if a medication allergy was reported, verbatim descriptions of the reaction were also recorded (see Clinic Visit Documentation for coding details). The protocol for coding reason text data is described in Section C below.

## SECTION B

## LEXI-DATA LINKS:
## GENERIC NAMES, THERAPEUTIC & PHARMACOLOGIC CLASS CODES

## LINKING TO LEXI-DATA THERAPEUTIC AND PHARMACOLOGIC CLASSES

The Lexicomp® Lexi-Data database is a relational database containing information about all types of medications -prescription, OTC, and alternatives such as supplements and herbals. The information is comprehensive ranging from medication names (generic, brand, trade) and active ingredients to details about therapeutic and pharmacologic effects as well as information about relationships among these. The database contains multiple tables and several unique identifiers (primary keys) that are used to link the tables. Data from the Lexi-Data database is added to the MIDUS and MIDJA datafiles by completing the following tasks:

- Linking MIDUS/MIDJA medication names to Lexi-Data Generic Names and their corresponding DrugIDs
- Use DrugIDs to extract therapeutic and pharmacologic class information from the Lexi-Data database.

This section describes the procedures for completing the above tasks along with the variables created as a result.

Therapeutic class data from the Lexi-Data database has also been added to other large studies (i.e.The National Social Life, Health, and Aging Project –NSHAP; AHRQ Medical Expenditures Panel Study – MEPS). To facilitate comparisons to those studies we have adopted similar variable naming and labeling conventions. Thus some of the MIDUS/MIDJA variable labels, as well as some parts of the documentation, may include references to Multum, the medical information company that originally developed the Lexicon/Lexi-Data database.

NOTE: The Lexicomp® Lexi-Data base is a proprietary database. Pursuant to our license with them users of data derived from the Lexi-Data file should include the following in any publications or presentations:

> ""Lexi-Data is a drug data solution offered by Wolters Kluwer Clinical Drug Information. Certain information about therapeutic effects and active ingredients of generic medications identified in the MIDUS (Midlife in the U.S.) or MIDJA study is derived from the Lexi-Data database and used under license from Lexi-Comp, Inc., which reserves all rights in that information."

### *Linking MIDUS/MIDJA Medication Names to Generic Names*

The Lexi-Data database was created for use in the U.S. thus it includes all FDA approved medications and an extensive array of non-prescription medications, supplements and herbals. Therefore, names of prescription medications in MIDUS were easily matched to Generic Names.

Many Japanese prescription medications, however, are not approved for use in the U.S. In addition, OTC, ALT and Quasi medication names are quite variable and not easily matched to Generic Names. To accommodate these differences, regardless of the study/wave, the following steps were followed when completing the matching step.

1. Direct match – A successful match required that MIDJA/MIDUS medication names be identical to the corresponding Generic Names. Thus, this first step was accomplished using an iterative process that relied on automatic merge functions as well as manual review.
    a. Automatic merge – medication names in MIDUS/MIDJA that were identical to Generic Names were matched.
    b. Manual review – medications names that were not matched at the preceding step (1a) were reviewed for typographical errors and formatting errors/inconsistencies and then modified to be consistent with the Lexi-Data Generic Names as appropriate. For example:
        i. 'Thyroid (desiccated)' changed to 'Thyroid Desiccated'
        ii. Replaced "+" with '-' (e.g.'Irbesartan + Hydrochlorothiazide' became 'Hydrochlorothiazide-Irbesartan')
        iii. 'cream' changed to 'topical'
        iv. 'eye drop' changed to 'ophthalmic'
    c. The automatic merge and manual review were repeated until all possible matches had been made. Medications that could not be matched to a Generic Name were flagged as UnMatched for further review in the next step.
2. Reviewing UnMatched Medications – many of the UnMatched medications could not be directly matched to a Generic Name because the name was incomplete, or the medication was identified by a brand or trade name. The Lexi-Data database includes information about brand/trade names as well as active ingredients which are linked to DrugIDs (and therefore, Generic Names). UnMatched medications were reviewed and matched to a Generic Name using this additional information whenever possible. In general this review and matching process was straightforward, however the active ingredient for certain medications varies according to whether the medication is prescribed or obtained over the counter. The following rules were followed in those instances.
    a. Mineral supplements:
        i. Potassium:
            1. Prescription medication used DrugID d01423 (Potassium Citrate)
            2. OTC/Quasi medication used DrugID d00345 (Potassium Chloride), the most common form used in OTC potassium supplements
    b. Vitamins:
        i. Vitamin D:

1. Prescription Vitamin D used DrugID d03128 (D2 Ergocalciferol)
2. OTC/Quasi Vitamin D used DrugID d03129 (D3 Cholecalciferol)

Medications that could not be assigned a Generic Name/DrugID after this second round of review were assigned a DrugID of d99999 (INAPP). See Appendix A for a list of DrugIDs and Generic Names in the MIDUS and MIDJA data files.

At the end of the matching process about 4% of the over 7000 MIDUS medications could not be matched. The vast majority are ALT medications, 88% compared to 2% and 10% for prescription and OTC medications, respectively. A larger proportion of the MIDJA medications are unmatched, about 33% of prescription medications and closer to half or more of the Quasi meds (54% at MIDJA 1, 47% at MIDJA 2). The Lexi-Data database was developed for use in the U.S. thus this difference is not surprising.

***Assigning Therapeutic and Pharmacologic Class Codes***

The Lexi-Data includes classification systems for categorizing drugs according to their therapeutic effects (i.e. how they are used to treat health problems) and their pharmacologic effects (i.e. the mechanism by which they have a given therapeutic effect). MIDUS/MIDJA medications that were Matched to Generic Names were assigned to both therapeutic and pharmacologic classes based on the DrugIDs associated with those names. UnMatched MIDUS/MIDJA medications were assigned only to therapeutic classes. The protocols for assigning codes to these groups are described separately below. Regardless of Matched or UnMatched status, the protocols for assigning the therapeutic and pharmacologic codes relies on the inherent order of those codes in the Lexi-Data system.

<u>Therapeutic Class Codes</u>

The Therapeutic Classification (TC) system has three tiers consisting of a set of nested (parent-child) categories that parallels the ways in which clinicians think about medications. The system is polyhierarchical and each therapeutic class has a unique code, thus each drug can be associated with as many categories, sub-categories and sub-sub categories as needed. Multum also strictly enforces the relationships between categories and sub-categories so that a given drug can always be described in the context of those relationships (per the Lexi-Comp Drug Classification documentation). All medications in the Lexi-Data are assigned to at least one top tier (parent) class. In addition, many top tier therapeutic classes were also assigned to one or two sub-classes. The Lexi-Data database relational structure also allows for linkage of medications to more than one parent class and/or sub-class. They have found that there is no need, as yet, for more than three parent or top tier classes for any given medication or the sub- or sub-sub-classes for any given parent class. We relied on this inherent ordering when assigning a second parent class or sub-class

to a given medication. Three sets of variables were created to indicate therapeutic class and position within the hierarchy. They are named and labeled according to the conventions described above (section A) in addition the '#' represents a digit from 1-3:

__TC# - Lexi-Data major therapeutic class codes
__TC#S# - Lexi-Data Sub-class codes for major therapeutic classes
__TC#S#_1 – Lexi-Data Sub-sub-class codes for major therapeutic classes

See Appendix C for a list of therapeutic class codes and category names.

Assigning TC Codes

All the matched MIDUS/MIDJA medications were assigned to at least one TC class (__TC#). Nearly all (99%) were then assigned to at least one sub-class (__TC#S#) with about 45% of MIDUS, and 25-35% of MIDJA, also assigned to at least one sub-sub-class (__TC#S#_1). The number of medications assigned to additional TC classes drops to less than 12% for the remaining TC variables. The TC codes begin at 1 and range into the 400's, but the codes are not rank ordered. In many instances the top tier code has the lowest value and the third tier has the highest but for some medications (example #2 Atorvastatin below), the value for the top parent category is much higher than the values for the child classes.

Examples:

1. Hydrochlorothiazide (HCTZ):
    a. __TC1 (Parent/Grandparent): 40 = Cardiovascular Agents
    b. __TC1S1 (Child/Sub-category): 49 = Diuretics
    c. __TC1S1_1 (Child/Sub-Sub category): 156 = Thiazide and Thiazide Like Diuretics
2. Atorvastatin –
    a. __TC1 (Parent/Grandparent): 358 = Metabolic Agent
    b. __TC1S1 (Child/Sub-category): 19 = Antihyperlipidemic Agents
    c. __TC1S1_1 (Child/Sub-Sub category): 173 = HMG COA Reductase Inhibitors

Assigning PC Codes

The Pharmacologic Classification (PC) system is flat and does not include parent/child relationships, but drugs can be assigned to multiple pharmacologic categories. Within MIDUS/MIDJA medications can be assigned to up to 6 PC categories, thus we created a set of 6 variables named and labeled according to the following convention, where the final digit is a value from 1-6:

__PC_ - Lexi-Data pharmacologic class codes

When a medication is assigned to more than one pharmacologic category, the codes are assigned in numeric order. For example Verapamil a blood pressure medication is assigned to four pharmacologic classes as follows:

__PC1 – 971 = Antiaginal Agent

__PC2 – 980 = Antiarrythmic Agent Class IV

__PC3 – 1313 = Calcium Channel Blocker

__PC4 – 1797079 = Calcium Channel Blocker Nondihydropyridine

See Appendix C for a list of pharmacologic class codes and category names.

TC and PC Codes for Combination Medications

The Multum Therapeutic classification system also includes codes for prescription combination medications (i.e. medications containing more than one active ingredient). The TC codes for a given active ingredient in the combination include the relevant codes for when it is used alone as well as when it is used combination with another active ingredient. All the relevant pharmacologic codes were assigned, thus they may be more informative for combination medications.

For example Hydrochlorothiazide is an active ingredient that is used to treat blood pressure. It can be used alone or in combination with other active ingredients.

1. When used alone it is assigned to TC & PC classes as follows:
    a. __TC1 (Parent/Grandparent): 40 = Cardiovascular Agents
    b. __TC1S1 (Child/Sub category): 49 = Diuretics
    c. __TC1S1_1 (Child/Sub-Sub category): 156 = Thiazide and Thiazide Like Diuretics
    d. __PC1 – Diuretic Thiazide

2. When used in combination with other medications (i.e. Lisinopril, Losartan, Triamterene etc.) it is assigned to TC & PC classes as follows:
    a. All the combinations are assigned the following Therapeutic Classification:
        i. Tier 1 (Parent/Grandparent): 40 = Cardiovascular Agents
        ii. Tier 2 (Child/Sub category): 55 = Antihypertensive Combinations
        iii. Tier 3 (Child/Sub-Sub category): There is no 3rd level.
    b. Each combination is assigned to multiple Pharmacologic categories based on the specific combination of active ingredients:
        i. Hydrochlorothiazide-Lisinopril
            957 = Angiotensin Converting Enzyme ACE Inhibitor
            1439 = Diuretic Thiazide

ii. Hydrochlorothiazide-Losartan

958 = Angiotensin II Receptor Blocker

1439 = Diuretic Thiazide

iii. Hydrochlorothiazide-Triamterene

1438 = Diuretic Potassium Sparing

1439 = Diuretic Thiazide

**Assigning TC Codes to *UnMatched* Medications**

Many of the MIDJA medications were UnMatched along with a portion of the OTC/ALT medications in MIDUS. To maximize the inclusion of UnMatched medications in cross-cultural analysis and to promote research on OTC/ALT medications (which are understudied in the U.S. compared to prescription medications) they were assigned therapeutic class codes using a process informed by coding completed for NSHAP (The National Social Life, Health, and Aging Project, Qato etal, 2009). Throughout the coding process we adopted a conservative approach in which therapeutic class codes but, not pharmacologic class codes, were assigned as the latter required information that was not available in the self-reported data. The following describes the protocol and decision rules used to assign therapeutic class codes. Ultimately, all but a handful of MIDUS/MIDJA medications were assigned to at least one therapeutic class.

UnMatched medications often consisted of a single ingredient (e.g. a particular active ingredient, vitamin, herb, or mineral) but many were comprised of multiple ingredients for which the therapeutic use was not clear. This was true of the Japanese prescription medications as well as OTC/ALT and Quasi medications. To obtain information about these medications, Google ™ was used to search for websites containing information about international prescription medications and/or containing product names and labels for OTC/ALT or Quasi medications. Many of these latter medications were listed by trade/product names, thus starting with a Google search was the most efficient way to confirm the product name and to also obtain information about active ingredients and the intended use of the medication. Information from Google searches was used as follows:

1. International Sites: The most frequently used website includes:
   - http://www.drugs.com/
   - http://www.rad-ar.or.jp/siori/english/kensaku.cgi
2. When a given product was found via a Google search ingredient lists and/or relevant information about the active components of a medication the web page was printed.
3. If necessary information about the intended use of the product was compared to participant data regarding route of administration and reason for taking to confirm that the correct product had been identified.

4. If it was determined that a medication name had been misspelled and was actually present in the Lexi-Data, or was comprised of ingredients that corresponded exactly to a single generic medication name in the Lexi-Data then the generic name for that medication was changed from “UnMatched” to the newly identified generic name.

See Appendix B for additional decision rules and a glossary of terms used to facilitate this process. Lexi-Data codes were assigned only if we were confident that the information obtained was for the medication recorded in our data file.

*References*

Qato, D.M., Schumm, L.P., Johnson, M., Mihai, A., and Lindau, S.T., (2009). Medication Data Collection and Coding in a Home-Based Survey of Older Adults. *Journal of Gerontology: Social Sciences, 64B(S1)*, i86-i93, doi:10.1093/geronb/gbp036.

**Dummy and Count Variables for Therapeutic and Pharmacologic Classes**

In addition to the therapeutic and pharmacologic class code variables described above we also created a set of dummy and count variables for commonly used categories of medications. To facilitate comparison with other studies such as AHRQ and NSHAP we created these dummy variables for the most frequently occurring therapeutic classes represented in the major class variables (__TC#) and the sub-class variables (__TC#S#) as well as the pharmacologic class variables (__PC#).

After identifying the set of TC and PC classes for which dummy variables would be created, count variables were generated to determine how many medications in a given class a given individual was taking. The count variables were created for the primary parent TC classes (__TC#), but they were not created for the TC Sub-classes (second tier). Note, these count variables are only included in the larger aggregate flat file, they are not included in the stacked file.

The variable names for these dummies incorporate the first 5-6 characters of the corresponding TC and PC variables as well as the numeric code for the TC or PC class. The variable label incorporates both the TC or PC class code and the category name. If a count variable was also created, then an “N” is added as the final character to the dummy variable name. For example a common parent (top tier) therapeutic class is 115=Nutritional Products. The dummy and count variables for this TC class are named/labeled as follows:

Dummy variable: __TC_115 = ‘Multum Therapeutic Class 115 - nutritional products: YES/NO?’

Count variable: __TC_115_N = ‘Multum Therapeutic Class 115 – nutritional products: HOW MANY?’

**SECTION C**

## CODING REASONS FOR TAKING MEDICATONS

## Coding Reasons for Taking Medications

The final piece of information recorded about a medication is the participant's response to the question "Why are you taking it?" Responses to this question were recorded verbatim to capture the participants understanding of why they think they are taking the medication. Many people were able to name specific conditions or diseases (high blood pressure, diabetes, asthma, arthritis etc.) as the reason for taking a medication, but others gave more general response (i.e. bone health, heart health, etc.). In addition many people reported taking medications "to maintain health", "because Dr./Spouse/Friend/etc. recommended it" and so on. Each response was coded into one of two mutually exclusive sets of categorical codes using a combination of more traditional procedures for coding text data and the IBM SPSS Text Analytics for Surveys (Version 4) described below. One set of codes is based on the International Disease Classification Codes, Version 9 (ICD-9) and the other was developed by MIDUS.

Note, the codes assigned are based on the participant's report of why they are taking a given medication. In some instances those reasons may not correspond to the reason that a clinician prescribed or recommended a medication.

At MIDUS 2 prior to data entry an ICD-9 was assigned to the reason for taking a given medication where possible. When that wasn't possible a general "Don't Know" code was assigned. When the medication data were reviewed for the Lexi-Data linkage these reason codes were reviewed and ultimately two sets of mutually exclusive Reason codes were developed.

1. **__ICD9M** – 3 digit numeric codes representing major categories in the International Classification of Diseases, 9th Revision. This is in contrast to the full 5 digit codes ICD-9 codes reported in clinical settings. The MIDUS/MIDJA text data are subjective reports from participants thus we adopted the more conservative approach of coding to more general categories that clearly included the specific disease/condition/symptom reported by the participant.
    a. The ICD9M codes correspond to the first 3 digits in the 5 digit ICD-9 codes. The value/category labels attached to the codes are based on the ICD-9 code labels.
    b. The ICD9 codes extend up to 999, thus 4 digit codes are used for Don't Know (9997), Missing (9998), and INAPP (9999)
    c. A primary resource for this coding was the free online searchable ICD-9 database created by Alkaline Software: http://www.icd9data.com/
2. **__MDC** - 5 character alphanumeric codes developed by MIDUS. These codes were assigned when a given reason for taking a medication could not be classified into an ICD-9 category. In general a MIDUS code was assigned when:

a. The reason was too generic/vague to be assigned to a specific ICD-9 category. Examples include “Stress” or “Stomach Acid” which were reported often enough that they have their own MIDUS category.
b. The medication was taken for preventive purposes rather than to treat an existing condition. For example ‘family history of heart disease’ or ‘Detox’ or ‘Boost immune system’ or ‘Brain health’ etc.
c. The medication was taken because it was recommended by a clinician, family member or friend, or has been reported in some venue (i.e. T.V., news, etc.) as being a ‘Good thing to do”.
d. Some reasons could not be assigned to any of the MIDUS categories or ICD9M categories were designated as “Unable to Classify’.

With the exception of medications for which the reason was “Don’t Know” or “Missing” all medications having a valid code for one of the above variables will be designated as INAPP for the other code. These variables are included in both the stacked medication file and the larger flat aggregated data files.

The __MDC codes were originally developed using reason text data from MIDUS 2 data. The alphanumeric coding categories were elaborated according to standard coding techniques after __ICD9M codes were assigned to all possible responses. The remaining responses were reviewed, a preliminary set of codes developed and assigned, and then refined/elaborated through an iterative process of independent review and then joint discussion by MIDUS Core staff.

The extant MIDUS 2 __ICD9M and __MDC codes form the basis for coding the subsequent MIDJA and MIDUS data which collectively include thousands of medications. These two sets of MIDUS 2 codes were combined into a coding template and then imported into the SPSS Text Analytics software. The codes were then applied to response text data from MIDJA and subsequent waves of MIDUS. Codes were added to the template, and/or refined, via an iterative process as new health conditions/diseases and other reasons that were not part of the MIDUS 2 data were identified. Ultimately the coded data were exported from Text Analysis for further review by independent coders prior to finalizing the codes. A copy of the __MDC coding scheme is available in Appendix D along with a list of the __ICD9M codes.

**SECTION D**

## APPENDICES

**A: GENERIC NAMES AND DRUGIDS**

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## APPENDIX A: GENERIC NAMES and DRUGIDs

The following lists the Lexi-Data DrugIDs and Generic Names in the MIDUS and MIDJA data files as of June 2016. The list is in order by DrugID and will be updated as needed with future data releases.

| DrugID | Generic Name |
|---|---|
| d00001 | acyclovir |
| d00002 | amiodarone |
| d00004 | atenolol |
| d00006 | captopril |
| d00011 | ciprofloxacin |
| d00013 | enalapril |
| d00015 | ibuprofen |
| d00016 | labetalol |
| d00018 | nadolol |
| d00019 | naproxen |
| d00021 | ranitidine |
| d00022 | warfarin |
| d00023 | allopurinol |
| d00024 | azaTHIOprine |
| d00027 | haloperidol |
| d00028 | ketoprofen |
| d00032 | propranolol |
| d00033 | sulindac |
| d00034 | zidovudine |
| d00037 | doxycycline |
| d00043 | clindamycin |
| d00044 | cloNIDine |
| d00045 | diltiazem |
| d00046 | erythromycin |
| d00047 | rifampin |
| d00048 | verapamil |
| d00049 | acetaminophen |
| d00050 | methadone |
| d00051 | NIFEdipine |
| d00056 | cefuroxime |
| d00058 | carBAMazepine |
| d00060 | methotrexate |
| d00061 | lithium |
| d00068 | ethambutol |
| d00070 | furosemide |
| d00071 | fluconazole |
| d00078 | didanosine |
| d00079 | cycloSPORINE |
| d00083 | valproic acid |
| d00084 | prednisoLONE |
| d00086 | amantadine |
| d00088 | amoxicillin |
| d00089 | amoxicillin-clavulanate |
| d00091 | azithromycin |

d00096 cephalexin

d00097 clarithromycin

d00101 isoniazid

d00102 itraconazole

d00106 methenamine

d00108 metroNIDAZOLE

d00110 minocycline

d00112 nitrofurantoin

d00117 pyrazinamide

d00124 sulfamethoxazole-trimethoprim

d00132 hydrALAZINE

d00134 metoprolol

d00135 minoxidil

d00137 pindolol

d00138 prazosin

d00140 cimetidine

d00141 famotidine

d00142 theophylline

d00143 phenytoin

d00144 nortriptyline

d00146 amitriptyline

d00148 diazepam

d00149 LORazepam

d00150 colchicine

d00151 bacampicillin

d00164 adenosine

d00168 ALPRAZolam

d00169 aMILoride

d00170 aspirin

d00175 benztropine

d00176 betaxolol

d00179 bumetanide

d00181 buPROPion

d00182 busPIRone

d00191 chlorpheniramine

d00193 cholestyramine

d00197 clonazePAM

d00198 clorazepate

d00210 digoxin

d00212 diphenhydrAMINE

d00213 dipyridamole

d00217 doxepin

d00223 epoetin alfa

d00231 felodipine

d00233 fentaNYL

d00234 flecainide

d00236 FLUoxetine

d00237 fluPHENAZine

d00241 folic acid

d00242 fosinopril

d00245 gemfibrozil

d00246 glipiZIDE

d00248 glyBURIDE

d00253 hydrochlorothiazide

d00254 hydrocortisone

d00255 HYDROmorphone

d00259 imipramine

d00260 indapamide

d00268 isosorbide dinitrate

d00269 isosorbide mononitrate

d00270 isradipine

d00273 ketorolac

d00278 levothyroxine

d00280 lovastatin

d00284 medroxyPROGESTERone

d00289 mercaptopurine

d00290 methimazole

d00293 methylPREDNISolone

d00298 metoclopramide

d00300 mexiletine

d00303 misoprostol

d00308 morphine

d00310 nabumetone

d00314 niacin

d00316 nicotine

d00321 nitroglycerin

d00322 nizatidine

d00325 omeprazole

d00328 oxybutynin

d00329 oxyCODONE

d00330 pancuronium

d00336 pentoxifylline

d00337 phenazopyridine

d00343 piroxicam

d00345 potassium chloride

d00346 povidone iodine topical

d00348 pravastatin

d00350 predniSONE

d00355 prochlorperazine

d00365 quinapril

d00366 quiNINE

d00371 sotalol

d00373 spironolactone

d00379 sulfaSALAzine

d00381 tamoxifen

d00384 temazepam

d00386 terazosin

d00395 traZODone

d00396 triamterene

d00397 triazolam

d00402 vitamin A

d00405 vitamin E

d00409 riboflavin

d00412 pyridoxine

d00413 cyanocobalamin

d00417 bioflavonoids

d00425 calcium carbonate

d00426 ascorbic acid

d00440 sodium bicarbonate

d00484 selenium

d00488 lysine

d00491 levOCARNitine

d00497 omega-3 polyunsaturated fatty acids

d00514 ticlopidine

d00529 tranexamic acid

d00534 estrone

d00537 estradiol

d00541 conjugated estrogens

d00542 esterified estrogens

d00543 estropipate

d00550 progesterone

d00555 norethindrone

d00558 testosterone

d00563 finasteride

d00578 arginine

d00583 desmopressin

d00595 glucose

d00598 calcitonin

d00608 fludrocortisone

d00609 cortisone

d00620 triamcinolone

d00628 betamethasone

d00646 trichlormethiazide

d00651 urea topical

d00653 isosorbide

d00655 thyroid desiccated

d00683 lidocaine topical

d00688 bepridil

d00689 amLODIPine

d00699 EPINEPHrine

d00704 phenylephrine

d00709 bisoprolol

d00726 doxazosin

d00728 ramipril

d00730 benazepril

d00732 lisinopril

d00743 sodium polystyrene sulfonate

d00746 simvastatin

d00749 albuterol

d00750 metaproterenol

d00755 pirbuterol

d00760 beclomethasone

d00762 acetylcysteine

d00769 pseudoephedrine

d00771 naphazoline ophthalmic

d00772 oxymetazoline nasal

d00773 tetrahydrozoline ophthalmic

d00787 promethazine

d00797 guaiFENesin

d00801 caffeine

d00806 phentermine

d00810 diethylpropion

d00813 benzocaine topical

d00814 methotrimeprazine

d00817 hydroxychloroquine

d00838 butorphanol

d00842 salsalate

d00848 diclofenac

d00851 etodolac

d00859 meclizine

d00861 dimenhyDRINATE

d00867 ondansetron

d00874 amoxapine

d00876 clomiPRAMINE

d00877 maprotiline

d00880 sertraline

d00900 methylphenidate

d00901 pemoline

d00907 hydrOXYzine

d00910 zolpidem

d00915 estazolam

d00960 carisoprodol

d00961 chlorphenesin

d00963 cyclobenzaprine

d00964 metaxalone

d00965 methocarbamol

d00966 orphenadrine

d00967 baclofen

d00970 trihexyphenidyl

d00972 biperiden

d00985 hyoscyamine

d00991 clidinium

d00992 glycopyrrolate

d00999 dicyclomine

d01002 pancrelipase

d01005 ursodiol

d01008 magnesium citrate

d01010 cascara sagrada

d01013 senna

d01015 bisacodyl

d01017 polycarbophil

d01018 psyllium

d01021 docusate

d01025 loperamide

d01026 bismuth subsalicylate

d01027 simethicone

d01031 mesalamine

d01032 olsalazine

d01185 apraclonidine ophthalmic

d01187 levobunolol ophthalmic

d01200 tropicamide ophthalmic

d01231 chlorhexidine topical

d01233 nystatin

d01244 tretinoin topical

d01256 etretinate

d01288 clobetasol topical

d01291 desoximetasone topical

d01293 fluocinolone topical

d01294 fluocinonide topical

d01296 fluticasone

d01300 mometasone topical

d01319 hydroquinone topical

d01322 aluminum chloride hexahydrate topical

d01325 arnica topical

d01333 benzalkonium chloride topical

d01353 leuprolide

d01373 hydroxyurea

d01376 PACLitaxel

d01385 beta-carotene

d01386 yohimbine

d01387 alprostadil

d01423 potassium citrate

d03050 loratadine

d03051 interferon beta-1b

d03052 hydrochlorothiazide-triamterene

d03061 butalbital

d03064 choline bitartrate

d03075 HYDROcodone

d03092 protease

d03126 calcitriol

d03128 ergocalciferol

d03129 cholecalciferol

d03130 thiamine

d03131 pantothenate

d03135 phytonadione

d03137 calcium-vitamin D

d03140 multivitamin

d03141 multivitamin with iron

d03145 multivitamin with minerals

d03148 multivitamin, prenatal

d03154 doxylamine

d03157 PARoxetine

d03159 choline

d03160 SUMAtriptan

d03180 risperiDONE

d03181 venlafaxine

d03182 gabapentin

d03183 fluvastatin

d03189 torsemide

d03195 miconazole topical

d03197 betamethasone topical

d03201 acyclovir topical

d03202 ketoconazole topical

d03204 fluorouracil topical

d03205 hydrocortisone topical

d03206 triamcinolone topical

d03208 metroNIDAZOLE topical

d03221 prednisoLONE ophthalmic

d03226 saliva substitutes

d03227 fluorometholone ophthalmic

d03229 levocabastine ophthalmic

d03238 ethinyl estradiol-norethindrone

d03241 ethinyl estradiol-norgestrel

d03242 ethinyl estradiol-levonorgestrel

d03245 esterified estrogens-methylTESTOSTERone

d03247 hydrochlorothiazide-spironolactone

d03258 atenolol-chlorthalidone

d03261 hydrochlorothiazide-propranolol

d03265 benazepril-hydrochlorothiazide

d03266 hydrochlorothiazide-lisinopril

d03289 acetaminophen-pseudoephedrine

d03292 ibuprofen-pseudoephedrine

d03298 chlorpheniramine-pseudoephedrine

d03300 chlorpheniramine-phenylephrine

d03311 brompheniramine-phenylephrine

d03313 chlorpheniramine/ phenylephrine/pyrilamine

d03331 APAP/ chlorpheniramine/ phenylephrine

d03342 APAP/ dextromethorphan/ pseudoephedrine

d03359 chlorpheniramine-dextromethorphan

d03379 guaiFENesin-pseudoephedrine

d03381 guaiFENesin-phenylephrine

d03409 dextromethorphan/ guaiFENesin/ pseudoephedrine

d03423 acetaminophen-codeine

d03425 APAP/butalbital/caffeine/codeine

d03428 acetaminophen-HYDROcodone

d03431 acetaminophen-oxyCODONE

d03434 acetaminophen-propoxyphene

d03439 APAP/ASA/caffeine

d03443 APAP/Al hydroxide/ASA/caffeine/Mg hydroxide

d03445 acetaminophen-diphenhydrAMINE

d03449 aspirin-caffeine

d03455 APAP/butalbital/caffeine

d03456 acetaminophen-butalbital

d03459 APAP/dichloralphenazone/ isometheptene

d03473 carbidopa-levodopa

d03478 Al hydroxide/Mg hydroxide/simethicone

d03485 atropine/hyoscyamine/ PB/scopolamine

d03492 chlordiazePOXIDE-clidinium

d03495 belladonna/ ergotamine/ PHENobarbital

d03496 docusate-senna

d03506 atropine-diphenoxylate

d03536 dexamethasone-tobramycin ophthalmic

d03543 hydrocortisone/neomycin/polymyxin B otic

d03561 betamethasone-clotrimazole topical

d03562 nystatin-triamcinolone topical

d03566 captopril-hydrochlorothiazide

d03591 alginic acid/Al hydroxide/Mg carbonate

d03596 alginic acid/Al hydroxide/Mg trisilicate

d03640 budesonide nasal

d03644 lactobacillus acidophilus

d03663 lecithin

d03665 menthol topical

d03674 pectin

d03680 ASA/citric acid/Na bicarb

d03686 undecylenic acid topical

d03689 calcium acetate

d03740 enalapril-hydrochlorothiazide

d03744 bisoprolol-hydrochlorothiazide

d03751 dexbrompheniramine-pseudoephedrine

d03752 tacrolimus

d03759 salmeterol

d03760 diphenhydrAMINE topical

d03768 ocular lubricant

d03781 ethinyl estradiol-norgestimate

d03782 desogestrel-ethinyl estradiol

d03788 calcipotriene topical

d03789 potassium gluconate

d03796 magnesium chloride

d03797 magnesium oxide

d03802 calcium lactate

d03803 calcium phosphate, tribasic

d03804 fluvoxaMINE

d03807 metFORMIN

d03809 lamoTRIgine

d03818 loratadine-pseudoephedrine

d03819 conjugated estrogens-medroxyPROGESTERone

d03821 losartan

d03822 ferrous gluconate

d03823 iron polysaccharide

d03824 ferrous sulfate

d03825 nisoldipine

d03826 traMADol

d03827 cetirizine

d03828 lansoprazole

d03829 amLODIPine-benazepril

d03830 hydrochlorothiazide-losartan

d03833 divalproex sodium

d03835 moexipril

d03838 valACYclovir

d03839 mycophenolate mofetil

d03846 acarbose

d03847 carvedilol

d03848 azelaic acid topical

d03849 alendronate

d03850 bicalutamide

d03858 lamiVUDine

d03864 glimepiride

d03866 calcium citrate

d03873 anastrozole

d03884 trolamine salicylate topical

d03897 lactase

d03908 APAP/ chlorpheniramine/ dextromethorphan/PPA

d03922 acetaminophen-caffeine

d03923 acetaminophen-phenylephrine

d03957 calcium/ferrous fumarate/vitamin D

d03968 dexamethasone ophthalmic

d03984 ritonavir

d04008 trandolapril

d04011 interferon beta-1a

d04012 terbinafine

d04017 latanoprost ophthalmic

d04025 mirtazapine

d04031 pilocarpine

d04032 sulfacetamide sodium-sulfur topical

d04034 remifentanil

d04035 amphetamine-dextroamphetamine

d04037 timolol ophthalmic

d04039 carteolol ophthalmic

d04040 fexofenadine

d04047 midodrine

d04048 brimonidine ophthalmic

d04050 OLANZapine

d04055 zinc chloride

d04056 zinc gluconate

d04057 zinc sulfate

d04058 melatonin

d04066 albuterol-ipratropium

d04068 azelastine nasal

d04099 donepezil

d04102 tiZANidine

d04105 atorvastatin

d04106 fosfomycin

d04109 levofloxacin

d04111 glatiramer

d04113 valsartan

d04115 topiramate

d04117 olopatadine ophthalmic

d04120 caffeine-ergotamine

d04121 tamsulosin

d04125 imiquimod topical

d04141 hydrochlorothiazide-moexipril

d04142 chromium picolinate

d04145 pramipexole

d04156 letrozole

d04157 loperamide-simethicone

d04181 cysteine

d04195 chlorophyllin

d04210 estradiol topical

d04215 rOPINIRole

d04220 QUEtiapine

d04222 irbesartan

d04223 mometasone nasal

d04233 triamcinolone nasal

d04235 ipratropium nasal

d04242 sodium chloride nasal

d04245 hydrochlorothiazide-irbesartan

d04248 methylcellulose

d04253 ZOLMitriptan

d04258 clopidogrel

d04261 raloxifene

d04266 eprosartan

d04267 repaglinide

d04268 dihydroergotamine nasal

d04270 fexofenadine-pseudoephedrine

d04271 diclofenac-misoprostol

d04275 beclomethasone nasal

d04279 flunisolide nasal

d04283 fluticasone nasal

d04284 fluticasone topical

d04285 naratriptan

d04286 fenofibrate

d04289 montelukast

d04290 calcium carbonate-magnesium hydroxide

d04293 hydrochlorothiazide-valsartan

d04294 tolterodine

d04298 phenylephrine topical

d04299 sildenafil

d04300 risedronate

d04303 dorzolamide-timolol ophthalmic

d04322 candesartan

d04329 sodium hyaluronate

d04332 citalopram

d04341 estradiol-norethindrone topical

d04342 inFLIXimab

d04349 leflunomide

d04357 trastuzumab

d04363 sevelamer

d04364 telmisartan

d04365 etanercept

d04369 insulin regular

d04370 insulin isophane

d04373 insulin lispro

d04374 insulin isophane-insulin regular

d04375 estradiol-norethindrone

d04376 abacavir

d04378 modafinil

d04380 celecoxib

d04382 cilostazol

d04395 clotrimazole topical

d04396 conjugated estrogens topical

d04399 nystatin topical

d04407 echinacea

d04408 St. John's wort

d04411 garlic

d04412 ginseng

d04413 ginkgo

d04414 ginger

d04415 saw palmetto

d04417 creatine

d04418 glucosamine

d04419 chondroitin

d04420 chondroitin-glucosamine

d04421 evening primrose

d04424 licorice

d04425 dehydroepiandrosterone

d04426 red yeast rice

d04427 levalbuterol

d04429 orlistat

d04432 carbonyl iron

d04434 rosiglitazone

d04440 perindopril

d04442 pioglitazone

d04448 RABEprazole

d04460 entacapone

d04463 grape seed oil

d04465 gotu kola

d04466 milk thistle

d04467 cat's claw

d04469 bee pollen

d04470 cranberry

d04472 black cohosh

d04476 bilberry

d04478 wild yam

d04480 eyebright

d04481 royal jelly

d04484 shark cartilage

d04486 rose hips

d04487 peppermint

d04488 lavender

d04490 green tea

d04491 flax

d04503 nedocromil ophthalmic

d04510 insulin lispro-insulin lispro protamine

d04514 pantoprazole

d04522 papaya

d04523 ubiquinone

d04532 meloxicam

d04538 insulin glargine

d04572 formoterol

d04611 fluticasone-salmeterol

d04695 colesevelam

d04697 insulin aspart

d04703 glyBURIDE-metFORMIN

d04708 zoledronic acid

d04711 candesartan-hydrochlorothiazide

d04722 diclofenac topical

d04737 hydrochlorothiazide-telmisartan

d04740 tacrolimus topical

d04743 nateglinide

d04749 esomeprazole

d04753 travoprost ophthalmic

d04754 bimatoprost ophthalmic

d04760 drospirenone-ethinyl estradiol

d04764 cetirizine-pseudoephedrine

d04766 acetaminophen-traMADol

d04773 ethinyl estradiol-etonogestrel

d04774 tenofovir

d04776 frovatriptan

d04778 valdecoxib

d04784 pimecrolimus topical

d04785 desloratadine

d04787 lovastatin-niacin

d04788 dutasteride

d04795 budesonide-formoterol

d04797 alfuzosin

d04798 tegaserod

d04801 olmesartan

d04803 voriconazole

d04812 escitalopram

d04813 horse chestnut

d04815 eplerenone

d04820 metFORMIN-rosiglitazone

d04823 glipiZIDE-metFORMIN

d04824 ezetimibe

d04825 ARIPiprazole

d04827 atomoxetine

d04828 teriparatide

d04829 tiotropium

d04835 adalimumab

d04836 cycloSPORINE ophthalmic

d04839 insulin aspart-insulin aspart protamine

d04849 eletriptan

d04851 rosuvastatin

d04857 gatifloxacin ophthalmic

d04860 moxifloxacin ophthalmic

d04875 betaine

d04878 hydrochlorothiazide-olmesartan

d04893 vardenafil

d04896 tadalafil

d04898 epinastine ophthalmic

d04899 memantine

d04901 fosamprenavir

d04939 sodium picosulfate

d05027 estriol

d05044 betamethasone-calcipotriene topical

d05048 amLODIPine-atorvastatin

d05062 carbocysteine

d05218 cinacalcet

d05234 hyaluronan

d05348 ezetimibe-simvastatin

d05350 polyethylene glycol 3350

d05355 DULoxetine

d05357 ibandronate

d05365 dexchlorpheniramine/ HYDROcodone/ phenylephrin

d05413 solifenacin

d05421 eszopiclone

d05422 darifenacin

d05471 alpha-D-galactosidase

d05488 pramlintide

d05508 pregabalin

d05526 alendronate-cholecalciferol

d05578 ramelteon

d05583 APAP/dextromethorphan/ phenylephrine

d05635 metFORMIN-pioglitazone

d05702 methylsulfonylmethane

d05703 chondroitin/ glucosamine/ methylsulfonylmethane

d05719 ranolazine

d05748 brewer's yeast

d05770 omeprazole-sodium bicarbonate

d05776 iodine

d05807 varenicline

d05819 diphenhydrAMINE-ibuprofen

d05851 levocetirizine

d05856 glimepiride-pioglitazone

d05896 sitaGLIPtin

d05964 aloe vera

d06032 fluocinolone otic

d06214 collagen

d06370 turmeric

d06392 wheat dextrin

d06507 cinnamon

d06652 strontium gluconate

d06655 alpha-lipoic acid

d06662 amLODIPine-valsartan

d06720 metFORMIN-sitaGLIPtin

d06848 lutein

d06867 biotin

d07130 naproxen-SUMAtriptan

d07132 olopatadine nasal

d07315 glutamine

d07347 bifidobacterium infantis

d07354 silodosin

d07397 febuxostat

d07498 amLODIPine-telmisartan

d07505 copper

d07637 pitavastatin

d07693 aspirin-calcium carbonate

d07754 azilsartan

d07767 linagliptin

d07876 mirabegron

d07891 icosapent

d99999 UNMATCHED, no generic name

## APPENDIX B: ASSIGNING THERAPEUTIC CLASS CODES TO UNMATCHED MEDICATIONS – DECISION RULES AND GLOSSARY

### Introduction

A central objective of the coding task was to be as precise as possible based on the supporting information available. Thus, UnMatched medications (see Section B above for additional details) were assigned to all possible classes based on:

1. Ingredient lists – if individual ingredients appear in the Lexi-Data, this information is used to determine therapeutic class assignment.
2. Results of internet searches (e.g. intended use)
3. Information provided by study participants (e.g. route of administration and why participant is taking the medication)

The following rules that guided this process in combination with a glossary of terms (see below) that was created as a resource for use in making decisions about therapeutic class assignments.

### Decision rules for linking Therapeutic Class (TC) codes to the UNMatched medications

UnMatched medications were reviewed and assigned TC codes according to the following guidelines.

1. If the medication contains a *single* ingredient:
    a. Assign the appropriate Generic Medication name if possible
    b. If not possible, assign the appropriate class code to as great a level of specificity as possible. For example:
        i. Alfalfa – TC1 = Alternative Medications; TC1S1 = Herbal Products
        ii. Silica –TC1= Nutritional Products; TC1S1=Minerals and Electrolytes
2. If the medication contains *multiple* ingredients **and**:
    a. All ingredients belong to a single therapeutic class, **and** the combination cannot be linked to a generic name, assign that Therapeutic Class code. For example:
        i. Cayenne Golden Seal (Cayenne Pepper and other herbs) – TC1 = Alternative Medications; TC1S1 = Herbal Products
        ii. Magnesium with Zinc – TC1= Nutritional Products; TC1S1=Minerals and Electrolytes

**OR**

    b. Ingredients belong to 2 or more therapeutic classes then specify all appropriate classes:
        i. Nu-Zimes – TC1= Gastrointestinal Agents; TC1S1=Digestive Enzyme and TC2=Alternative Medications; TC2S1=Probiotics

ii. Estroven – TC1=Alternative Medications; TC1S1=Nutraceutical Products; TC1S2=Herbal Products

3. Additional Rules: MIDUS project staff coded the UnMatched medications and then the codes were reviewed by Dr. David Kiefer. The following rules were implemented based on that review and subsequent discussion with Dr. Love.
    a. Oils (e.g. borage, black currant, etc.) – are classified as both Herbals and Nutraceuticals if they are derived from plants.
    b. Chlorella is an alga, but algae are not plants, thus medications containing Chlorella should be classified as Nutraceuticals.
    c. Silver is a metal, not a mineral, thus it should be classified as a Nutraceutical.
    d. Quercitin – should be classified as an Herbal, as well as a Nutraceutical if it is derived from a plant.
    e. Foods (e.g. Vinegar, Maitake mushrooms, juices) are assigned to one or more therapeutic class if dose (i.e. reported in mg, capsule, tablespoons, ounces etc.) and reason for taking confirm medicinal use.
    f. Homeopathic remedies are classified as Alternative Medicines. Homeopathy seeks to stimulate the body's ability to heal itself by giving very small doses of highly diluted substances. This therapeutic method was developed by German physician Samuel Christian Hahnemann at the end of the 18th century. Homeopathic remedies are derived from natural substances that come from plants minerals, or animals. Common remedies include red onion, arnica (mountain herb), and stinging nettle plant. (downloaded on 4-3-12 from http://nccam.nih.gov/health/homeopathy)

**Glossary of Terms**

Most of UnMatched medications were reported as Alternative or Quasi, thus a glossary of terms was created as a resource for use in assigning therapeutic class codes. The website for the National Center for Complementary and Alternative Medicine (NCCAM; http://nccam.nih.gov/health) was a primary resource for these definitions. If relevant information was not available through NCCAM information was obtained through internet searches using the search engine Google™ (www.google.com) that typically led to one or more of the following websites.

- U.S. Food and Drug Administration: http://www.fda.gov
- American Association of Clinical Endocrinologists: https://www.aace.com/sites/default/files/Nutraceuticals2003.pdf
- Medical Dictionary: http://medical-dictionary.thefreedictionary.com
- UC Berkeley Wellness Newsletter: http://www.wellnessletter.com
- Wikipedia: http://en.wikipedia.org/wiki

The source of glossary definitions and the date the information was obtained is included in each listing. Included with the definitions are lists of generic medication names in these categories from the Lexicon as well as examples of MIDUS medications names that meet the categorical definitions but don't appear in the Lexicon. The glossary structure parallels the tiered therapeutic class structure in that the parent class is listed first and then the relevant child classes. Class codes are in parenthesis following the class name.

***Gastrointestinal Agents (87)****:* Drugs used for their effects on the gastrointestinal system, as to control gastric acidity, regulate gastrointestinal motility and water flow, and improve digestion. (downloaded on 1-12-12 from http://www.reference.md/files/D005/mD005765.html)

a. **Digestive enzymes (91)**: proteins that catalyze reactions between other chemicals by reducing the energy required for the reactions. They include **salivary** (amylase), **gastric** (pepsin), **pancreatic** (trypsin, chymotrypsin, amylase, lipase), **small intestinal mucosa** (carbohydrases including isomaltase, lactase, maltase, sucrase, trehalase). (downloaded on 1-17-12 from http://medical-dictionary.thefreedictionary.com/Digestive+enzymes).

Examples from *Lexicon*:

- alpha-D-galactosidase, amylase/cellulase/lipase/protease,
- cellulase/hyoscyamin/pancrelipase/phenyltolox,
- digestive enzymes/hyoscyamine/phenyltoloxamin,
- lactase, lipase,
- pancreatin, pancrelipase, pepsin, phytase, protease,
- sacrosidase,

Examples from *MIDUS UnMatched*

- Enzaid, Nu-zimes, Colon Cleanse

b. **Laxatives (95)**: drugs that promote bowel movements. They are used to prevent or treat constipation. They are also used to prepare the bowel for an examination or surgical procedure. Laxatives work in different ways, by stimulating colon movement, adding bulk to the contents of the colon, or drawing fluid or fat into the intestine. Some laxatives work by combining these functions. Most primary care physicians recommend that patients try the bulk-producing laxatives first before taking saline or stimulant laxatives.

Note: when assigning TC codes the reason the person was taking a product that included psyllium or polycarbophil was used to determine the code assigned. If the participant reported taking the

medication as a source of “Fiber” then the TC code for bulk-producing Laxative was assigned (see below).

i. Bisacodyl is a non-prescription stimulant laxative. It reduces short-term constipation and is also used to prepare the colon or rectum for an examination or surgical procedure. The drug works by stimulating colon movement (peristalsis); constipation is usually relieved within 15 minutes to one hour after administration of a suppository form and in 6 to 12 hours after taking the drug orally.

ii. Docusate Calcium/Docusate Sodium, a non-prescription laxative, helps a patient avoid constipation by softening the stool. It works by increasing the penetration of fluids into the stool by emulsifying feces, water and fat. Docusate prevents constipation and softens bowel movements and fecal impactions. This laxative should relieve constipation within one to three days.

iii. Senna/senokot is a non-prescription laxative that reduces constipation by promoting colon movement

Examples from *Lexicon*: psyllium, psyllium-senna, wheat dextrin, polycarbophil, sorbitol

Examples from *MIDUS UnMatched*: Natural vegetable laxative

***Nutritional Products (115)***: Nutritional supplements include vitamins, minerals, herbs, meal supplements, sports nutrition products, natural food supplements, and other related products used to boost the nutritional content of the diet. Nutritional supplements are used for many purposes. They can be added to the diet to boost overall health and energy; to provide immune system support and reduce the risks of illness and age-related conditions; to improve performance in athletic and mental activities; and to support the healing process during illness and disease. However, most of these products are treated as food and not regulated as drugs are. (downloaded from http://medical-dictionary.thefreedictionary.com/Nutritional+Supplements 1-12-12)

a. **Minerals and Electrolytes (117)**:

Examples from *Lexicon*:

- ammonium chloride, ammonium molybdate tetrahydrate,
- calcium acetate, calcium acetate-magnesium carbonate, calcium carbonate, calcium carbonate-sodium fluoride, calcium chloride, calcium citrate, calcium glubionate, calcium gluceptate, calcium gluconate, calcium glycerophosphate, calcium glycerophosphate-calcium lactate, calcium lactate, calcium phosphate, tribasic,
- chromic chloride hexahydrate, chromium picolinate,

- citric acid, citric acid/K citrate/Na citrate, citric acid-potassium bicarbonate, citric acid-potassium citrate, citric acid-sodium citrate,
- copper chloride, copper gluconate, copper sulfate,
- electrolyte replacement solutions, oral,
- fluoride, fluoride topical,
- iodine, iodine-potassium iodide, lanthanum carbonate,
- magnesium amino acids chelate, magnesium aspartate, magnesium carbonate, magnesium chloride, magnesium gluconate, magnesium lactate, magnesium oxide, magnesium sulfate, magnesium trisilicate,
- manganese chloride, manganese sulfate,
- potassium acetate, potassium acetate/K bicarbonate/K citrate, potassium bicarbonate, potassium bicarbonate-potassium chloride, potassium bicarbonate-potassium citrate, potassium bitartrate, potassium chloride, potassium chloride-sodium chloride, potassium gluconate, potassium phosphate, potassium phosphate-sodium phosphate, potassium sulfate,
- selenium,
- sodium acetate, sodium bicarbonate, sodium chloride, sodium iodide, sodium lactate, sodium phosphate,
- strontium gluconate, tromethamine,
- zinc acetate, zinc chelazome, zinc chloride, zinc citrate, zinc gluconate, zinc glycinate, zinc sulfate

Examples from *MIDUS UnMatched*

- Juice Plus products
- Boost
- Essential Fatty Acids (product name)

b. **Oral Nutritional Supplements (118)**: Dextrose is a common oral nutritional supplement. It is used chiefly as a fluid and nutrient replenisher, and also as a diuretic and for various other clinical purposes. Dextrose is sometimes taken as a health supplement when blended with other substances, usually creatine and glutamine, according to Bodyactiveonline.com. Athletes, body builders and those seeking to lose weight can take a 50-mg dose just after working out to optimize the way the body processes protein and other nutrients. It also provides the body with a post-workout energy boost.)

Examples from *Lexicon*:

- Nutritional Supplments : bioflavonoids-zinc glycinate, cysteine, fluoride, lysine, medium chain triglycerides

- Oral Nutritional Supplements: Arginine, citicoline, d-xylitol, fat supplement, oral medium chain triglycerides, phytase-zinc citrate, potassium aminobenzoate

Examples from *MIDUS UnMatched*

- Nature's Plus Source of Life Energy Shake, Losol

***Alternative Medications (218)**:* NCCAM (http://nccam.nih.gov/health/whatiscam) defines Complementary and Alternative Medicine (CAM) as a group of diverse medical and health care systems, practices, and products that are not generally considered part of conventional medicine. Conventional medicine (also called Western or allopathic medicine) is medicine as practiced by holders of M.D. (medical doctor) and D.O. (doctor of osteopathy medicine) degrees and by allied health professionals, such as physical therapists, psychologists, and registered nurses. The boundaries between CAM and conventional medicine are not absolute, and specific CAM practices may, over time, become widely accepted. "Complementary medicine" refers to use of CAM **together with** conventional medicine, such as using acupuncture in addition to usual care to help lessen pain. Most use of CAM by Americans is complementary. "Alternative medicine" refers to use of CAM **in place of** conventional medicine. "Integrative medicine" combines treatments from conventional medicine and CAM for which there is some high-quality evidence of safety and effectiveness. It is also called integrated medicine. CAM practices are often grouped into broad categories, such as natural products, mind and body and medicine, manipulative and body-based practices. Although these categories are not formally defined, they are useful for discussing CAM practices. Some CAM practices may fit into more than one category.

The Natural Products practice is most relevant for the coding medication. This area of CAM includes use of a variety of herbal medicines (also known as botanicals), vitamins, minerals, and other "natural products." Many are sold over the counter as dietary supplements. (Some uses of dietary supplements—e.g., taking a multivitamin to meet minimum daily nutritional requirements or taking calcium to promote bone health—are not thought of as CAM.) CAM "natural products" also include probiotics—live microorganisms (usually bacteria) that are similar to microorganisms normally found in the human digestive tract and that may have beneficial effects. Probiotics are available in foods (e.g., yogurts) or as dietary supplements. They are not the same thing as prebiotics—nondigestible food ingredients that selectively stimulate the growth and/or activity of microorganisms already present in the body.

Note: NCCAM does not identify nutraceuticals specifically as CAM but the following was obtained through a link on the NCCAM website. In addition the Lexicon identifies Nutraceuticals as a sub-class of Alternative Medications.

a. **Nutraceutical Products (219)**: dietary supplements that contain a concentrated form of a presumed bioactive substance originally derived from a food, but now present in a nonfood matrix, and used to enhance health in dosages exceeding those obtainable from normal foods (13). For instance, soy protein is a dietary supplement, but ipriflavone, a synthetic derivative of the isoflavone daidzein found in soy protein, is a nutraceutical. One might not be able to ingest sufficient soy protein to provide the amounts of ipriflavone necessary to have effects on bone health. Another example is ingestion of concentrated omega-3 fatty acid (fish oil) capsules in comparison with eating the pounds of fish necessary for a cardioprotective effect. (downloaded 1-12-12 from -https://www.aace.com/sites/default/files/Nutraceuticals2003.pdf):

Examples from *Lexicon*:

- alpha-lipoic acid, betaine,
- choline, chondroitin, chondroitin/glucosamine/methylsulfonylmethane, chondroitin-glucosamine, creatine,
- dehydroepiandrosterone,
- genistein, glucosamine, glutamic acid, glutamine,
- inositol, lecithin, levOCARNitine, lutein, lysine,
- melatonin, methionine, methylsulfonylmethane,
- omega-3 polyunsaturated fatty acids,
- pycnogenol, red yeast rice, s-adenosylmethionine,
- threonine, tryptophan, ubiquinone

Examples from *MIDUS UnMatched*:

- Quercitin – plant derived flavonoid used in supplements, beverages, or foods.
- Inulin - a starchy substance found in a wide variety of fruits, vegetables, and herbs. It is most commonly obtained by soaking chicory roots in hot water. Inulin is not digested or absorbed in the stomach. It goes to the bowels where bacteria are able to use it to grow. It supports the growth of a special kind of bacteria that are associated with improving bowel function and general health. Inulin decreases the body's ability to make certain kinds of fats. It is also known as -Beta(2-1) fructans, Chicory Extract, Chicory Inulin, Dahlia Extract, Dahlia Inulin, Fructo-Oligosaccharides, Fructooligosaccharides, Inulina, Inuline, Long-chain Oligosaccharides, Oligosaccharides, Prebiotic.
- Ipriflavone
- Adrenal or other Animal tissue

- Concentrates from plans e.g. phytosterol
- Astaxanthin (carotenoid)
- Soy Products listed as “soy tablets” or “soy menopause supplements” are coded as nutraceuticals. Google searches of these products indicate that they typically contain soy isoflavones

b. ***Herbal Products***: An herb is a plant or plant part (such as leaves, flowers, or seeds) that is used for its flavor, scent, and/or therapeutic properties. "Botanical" is often used as a synonym for "herb." An herbal product may contain a single herb or mixtures of herbs (downloaded on 1-12-12 from - http://nccam.nih.gov/health/supplements/wiseuse.htm )

Examples from *Lexicon*:

- 5-hydroxytryptophan, aloe vera, aloe vera topical, arnica topical,
- barberry, bee pollen, bilberry, bilberry/evening primrose/flax, black cohosh, black haw, blue cohosh,
- capsicum, cat's claw, chamomile, chaparral, cinnamon, clove, comfrey, cranberry,
- damiana, dandelion, devil's claw, dong quai,
- Echinacea, evening primrose, eyebright,
- fennel, fenugreek, feverfew, flax,
- garlic, gentian, ginger, ginkgo, ginseng, Goldenseal, gotu kola, grape seed oil, green tea, guarana,
- horse chestnut, jojoba topical, kava, lavender, licorice, ma huang, milk thistle, nettles,
- papaya, pennyroyal, peppermint, pitcher plant, raspberry, rose hips, royal jelly,
- saw palmetto, skullcap, shark cartilage, slippery elm, St. John's wort,
- tea tree topical, turmeric, valerian, wild yam.

Examples from *MIDUS UnMatched*:

- Acai, Alfalfa, Black Currant Oil, Burdock Root

c. **Probiotics (363)**: Probiotics are live microorganisms (e.g., bacteria) that are either the same as or similar to microorganisms found naturally in the human body and may be beneficial to health. Also referred to as "good bacteria" or "helpful bacteria," probiotics are available to consumers in oral products such as dietary supplements and yogurts, as well as other products such as suppositories and creams. (downloaded on 1-12-12 from -http://nccam.nih.gov/health/probiotics/introduction.htm)

Examples from *Lexicon*:

- bifidobacterium infantis, bifidobacterium-lactobacillus, brewer's yeast,
- lactobacillus acidophilus, lactobacillus bulgaricus, lactobacillus casei, lactobacillus reuteri, lactobacillus rhamnosus GG,
- lactobacillus acidophilus and bulgaricus, lactobacillus acidophilus-lactobacillus casei,
- saccharomyces boulardii lyo

Examples from *MIDUS UnMatched*:

- Primal Defense, Probioplex Intensive Care, Lactozyme

## APPENDIX C: THERAPEUTIC AND PHARMACOLOGIC CLASS CODES AND NAMES

This Appendix contains two lists 1) Therapeutic Class (TC) codes and category names, and 2) Pharmacologic Class (PC) codes and categories included in the MIDUS and MIDJA data files as of June 2016. These lists will be updated as needed at future releases.

### Therapeutic Class Codes and Names

The Therapeutic Classification (TC) system has three tiers consisting of a set of nested (parent-child) categories that parallels the ways in which clinicians think about medications. The system is polyhierarchical and each therapeutic class has a unique code. See Section B above for details. The list below is organized in nested in numeric order. The top tier (Parent/Grandparent) class codes are in the leftmost column. All middle tier (Parent/Child) class codes are listed under their top tier parent code. Similarly, all bottom tier (Child/Grandchild) class codes are listed under their middle tier "Parent" codes. All category names are listed in the rightmost column. Color coding is used to help illustrate the relationships among the therapeutic classes.

**Multum Therapeutic Classes**

| Top Tier (Parent/ Grandparent) | Middle Tier (Parent/ Child) | Bottom Tier (Child/ GrandChild) | Therapeutic Class Names |
|---|---|---|---|
| 1 | | | ANTI-INFECTIVES |
| | 2 | | AMEBICIDES |
| | 4 | | ANTIFUNGALS |
| | | 236 | AZOLE ANTIFUNGALS |
| | | 237 | MISCELLANEOUS ANTIFUNGALS |
| | 6 | | ANTITUBERCULOSIS AGENTS |
| | | 232 | RIFAMYCIN DERIVATIVES |
| | | 234 | MISCELLANEOUS ANTITUBERCULOSIS AGENTS |
| | | 457 | HYDRAZIDE DERIVATIVES |
| | 7 | | ANTIVIRAL AGENTS |
| | | 177 | MISCELLANEOUS ANTIVIRALS |
| | | 229 | PURINE NUCLEOSIDES |
| | | 281 | NEURAMINIDASE INHIBITORS |
| | 9 | | CEPHALOSPORINS |
| | | 159 | FIRST GENERATION CEPHALOSPORINS |
| | | 160 | SECOND GENERATION CEPHALOSPORINS |
| | | 161 | THIRD GENERATION CEPHALOSPORINS |

| Top Tier (Parent/ Grandparent) | Middle Tier (Parent/ Child) | Bottom Tier (Child/ GrandChild) | Therapeutic Class Names |
|---|---|---|---|
| | 11 | | MACROLIDE DERIVATIVES |
| | | 304 | MACROLIDES |
| | 12 | | MISCELLANEOUS ANTIBIOTICS |
| | 13 | | PENICILLINS |
| | | 224 | AMINOPENICILLINS |
| | 14 | | QUINOLONES |
| | 15 | | SULFONAMIDES |
| | 17 | | URINARY ANTI INFECTIVES |
| | 18 | | AMINOGLYCOSIDES |
| 20 | | | ANTINEOPLASTICS |
| | 23 | | ANTIMETABOLITES |
| | 24 | | ANTINEOPLASTIC HORMONES |
| 40 | | | CARDIOVASCULAR AGENTS |
| | 42 | | ANGIOTENSIN CONVERTING ENZYME INHIBITORS |
| | 43 | | ANTIADRENERGIC AGENTS PERIPHERALLY ACTING |
| | 45 | | ANTIANGINAL AGENTS |
| | 46 | | ANTIARRHYTHMIC AGENTS |
| | | 385 | GROUP I ANTIARRHYTHMICS |
| | | 387 | GROUP III ANTIARRHYTHMICS |
| | | 388 | GROUP IV ANTIARRHYTHMICS |
| | | 389 | GROUP V ANTIARRHYTHMICS |
| | 47 | | BETA ADRENERGIC BLOCKING AGENTS |
| | | 274 | CARDIOSELECTIVE BETA BLOCKERS |
| | | 275 | NON-CARDIOSELECTIVE BETA BLOCKERS |
| | 48 | | CALCIUM CHANNEL BLOCKING AGENTS |
| | 49 | | DIURETICS |
| | | 154 | LOOP DIURETICS |
| | | 155 | POTASSIUM-SPARING DIURETICS |
| | | 156 | THIAZIDE AND THIAZIDE-LIKE DIURETICS |
| | 50 | | INOTROPIC AGENTS |
| | 51 | | MISCELLANEOUS CARDIOVASCULAR AGENTS |
| | 52 | | PERIPHERAL VASODILATORS |
| | 53 | | VASODILATORS |

| Top Tier (Parent/ Grandparent) | Middle Tier (Parent/ Child) | Bottom Tier (Child/ GrandChild) | Therapeutic Class Names |
|---|---|---|---|
| | 55 | | ANTIHYPERTENSIVE COMBINATIONS |
| | 56 | | ANGIOTENSIN II INHIBITORS |
| | 340 | | ALDOSTERONE RECEPTOR ANTAGONISTS |
| 57 | | | CENTRAL NERVOUS SYSTEM AGENTS |
| | 58 | | ANALGESICS |
| | | 59 | MISCELLANEOUS ANALGESICS |
| | | 60 | NORCOTIC ANALGESICS |
| | | 61 | NONSTEROIDAL ANTI-INFLAMMATORY AGENTS |
| | | 62 | SALICYLATES |
| | | 63 | ANALGESIC COMBINATIONS |
| | | 193 | ANTIMIGRAINE AGENTS |
| | | 278 | COX-2 INHIBITORS |
| | 64 | | ANTICONVULSANTS |
| | | 203 | BENZODIAZEPINE ANTICONVULSANTS |
| | | 311 | DIBENZAZEPINE ANTICONVULSANTS |
| | | 345 | FATTY ACID DERIVATIVE ANTICONVULSANTS |
| | | 347 | GAMMA-AMINOBUTYRIC ACID ANALOGS |
| | | 348 | TRIAZINE ANTICONVULSANTS |
| | | 351 | CARBONIC ANHYDRASE INHIBITOR ANTICONVULSANTS |
| | 65 | | ANTIEMETIC ANTIVERTIGO AGENTS |
| | | 196 | PHENOTHIAZINE ANTIEMETICS |
| | | 198 | MISCELLANEOUS ANTIEMETICS |
| | 66 | | ANTIPARKINSON AGENTS |
| | | 205 | ANTICHOLINERGIC ANTIPARKINSON AGENTS |
| | 67 | | ANXIOLYTICS SEDATIVES AND HYPNOTICS |
| | | 69 | BENZODIAZEPINES |
| | | 70 | MISCELLANEOUS ANXIOLYTICS, SEDATIVES AND HYPNOTICS |
| | 71 | | CNS STIMULANTS |
| | 73 | | MUSCLE RELAXANTS |
| | | 74 | NEUROMUSCULAR BLOCKING AGENTS |
| | | 178 | SKELETAL MUSCLE RELAXANTS |
| | | | |
| | | | |

| Top Tier (Parent/ Grandparent) | Middle Tier (Parent/ Child) | Bottom Tier (Child/ GrandChild) | Therapeutic Class Names |
|---|---|---|---|
| 81 | | | COAGULATION MODIFIERS |
| | 82 | | ANTICOAGULANTS |
| | | 262 | COUMARINS AND INDANEDIONES |
| | 83 | | ANTIPLATELET AGENTS |
| | | 211 | PLATELET AGGREGATION INHIBITORS |
| | 85 | | MISCELLANEOUS COAGULATION MODIFIERS |
| 87 | | | GASTROINTESTINAL AGENTS |
| | 88 | | ANTACIDS |
| | 90 | | ANTIDIARRHEALS |
| | 91 | | DIGESTIVE ENZYMES |
| | 92 | | GALLSTONE SOLUBILIZING AGENTS |
| | 93 | | GI STIMULANTS |
| | 94 | | H2 ANTAGONISTS |
| | 95 | | LAXATIVES |
| | 96 | | MISCELLANEOUS GI AGENTS |
| | 272 | | PROTON PUMP INHIBITORS |
| | 277 | | 5 AMINOSALICYLATES |
| 97 | | | HORMONES/HORMONE MODIFIERS |
| | 98 | | ADRENAL CORTICAL STEROIDS |
| | | 301 | GLUCOCORTICOIDS |
| | 101 | | SEX HORMONES |
| | | 279 | GONADOTROPIN-RELEASING HORMONE AND ANALOGS |
| | 103 | | THYROID HORMONES |
| | 288 | | 5 ALPHA REDUCTASE INHIBITORS |
| | 417 | | SELECTIVE ESTROGEN RECEPTOR MODULATORS |
| | 418 | | PARATHYROID HORMONE AND ANALOGS |
| | 420 | | ANTIANDROGENS |
| | 423 | | AROMATASE INHIBITORS |
| 105 | | | MISCELLANEOUS AGENTS |
| | 107 | | CHELATING AGENTS |
| | 110 | | MISCELLANEOUS UNCATEGORIZED AGENTS |
| | 192 | | ANTIRHEUMATICS |
| | 270 | | ANTIPSORIATICS |

| Top Tier (Parent/ Grandparent) | Middle Tier (Parent/ Child) | Bottom Tier (Child/ GrandChild) | Therapeutic Class Names |
|---|---|---|---|
| | 284 | | VISCOSUPPLEMENTATION AGENTS |
| 113 | | | GENITOURINARY TRACT AGENTS |
| | 264 | | URINARY ANTISPASMODICS |
| | 265 | | URINARY PH MODIFIERS |
| 115 | | | NUTRITIONAL PRODUCTS |
| | 116 | | IRON PRODUCTS |
| | 117 | | MINERALS AND ELECTROLYTES |
| | 118 | | ORAL NUTRITIONAL SUPPLEMENTS |
| | 119 | | VITAMINS |
| | 120 | | VITAMIN AND MINERAL COMBINATIONS |
| | 121 | | INTRAVENOUS NUTRITIONAL PRODUCTS |
| 122 | | | RESPIRATORY AGENTS |
| | 123 | | ANTIHISTAMINES |
| | 125 | | BRONCHODILATORS |
| | | 126 | METHYLXANTHINES |
| | | 180 | ADRENERGIC BRONCHODILATORS |
| | | 181 | BRONCHODILATOR COMBINATIONS |
| | | 299 | ANTICHOLINERGIC BRONCHODILATORS |
| | 127 | | DECONGESTANTS |
| | 128 | | EXPECTORANTS |
| | 130 | | RESPIRATORY INHALANT PRODUCTS |
| | | 296 | INHALED CORTICOSTEROIDS |
| | 132 | | UPPER RESPIRATORY COMBINATIONS |
| | 243 | | LEUKOTRIENE MODIFIERS |
| 133 | | | TOPICAL AGENTS |
| | 135 | | ANTISEPTIC AND GERMICIDES |
| | 136 | | DERMATOLOGICAL AGENTS |
| | | 138 | TOPICAL STEROIDS |
| | | 140 | MISCELLANEOUS TOPICAL AGENTS |
| | | 141 | TOPICAL STEROIDS WITH ANTI INFECTIVES |
| | | 248 | TOPICAL EMOLLIENTS |
| | | 292 | TOPICAL ANTIFUNGALS |
| | | 381 | TOPICAL DEPIGMENTING AGENTS |

| Top Tier (Parent/ Grandparent) | Middle Tier (Parent/ Child) | Bottom Tier (Child/ GrandChild) | Therapeutic Class Names |
|---|---|---|---|
| | | 382 | TOPICAL ANTIHISTAMINES |
| | | 448 | TOPICAL NON-STEROIDAL ANTI-INFLAMMATORIES |
| | 147 | | OPHTHALMIC PREPARATIONS |
| | | 163 | OPHTHALMIC ANTI-INFECTIVES |
| | | 164 | OPHTHALMIC GLAUCOMA AGENTS |
| | | 165 | OPHTHALMIC STEROIDS |
| | | 169 | MISCELLANEOUS OPHTHALMIC AGENTS |
| | | 267 | OPHTHALMIC ANTIHISTAMINES AND DECONGESTANTS |
| | | 286 | MYDRIATICS |
| | 151 | | VAGINAL PREPARATIONS |
| | | 268 | VAGINAL ANTI-INFECTIVES |
| | 247 | | NASAL PREPARATIONS |
| | | 245 | NASAL STEROIDS |
| | | 246 | NASAL ANTIHISTAMINES AND DECONGESTANTS |
| 218 | | | ALTERNATIVE MEDICINES |
| | 219 | | NUTRACEUTICAL PRODUCTS |
| | 220 | | HERBAL PRODUCTS |
| | 363 | | PROBIOTICS |
| 242 | | | PSYCHOTHERAPEUTIC AGENTS |
| | 249 | | ANTIDEPRESSANTS |
| | | 208 | SSRI ANTIDEPRESSANTS |
| | | 209 | TRICYCLIC ANTIDEPRESSANTS |
| | | 306 | PHENYLPIPERAZINE ANTIDEPRESSANTS |
| | | 307 | TETRACYCLIC ANTIDEPRESSANTS |
| | | 308 | SSNRI ANTIDEPRESSANTS |
| | 251 | | ANTIPSYCHOTICS |
| | | 77 | MISCELLANEOUS ANTIPSYCHOTIC AGENTS |
| | | 210 | PHENOTHIAZINE ANTIPSYCHOTICS |
| | | 341 | ATYPICAL ANTIPSYCHOTICS |
| 254 | | | IMMUNOLOGIC AGENTS |
| | 104 | | IMMUNOSUPPRESSIVE AGENTS |
| | | 441 | CALCINEURIN INHIBITORS |
| | | 445 | OTHER IMMUNOSUPPRESSANTS |

| Top Tier (Parent/ Grandparent) | Middle Tier (Parent/ Child) | Bottom Tier (Child/ GrandChild) | Therapeutic Class Names |
|---|---|---|---|
| 331 | | | RADIOLOGIC AGENTS |
| | 332 | | RADIOLOGIC ADJUNCTS |
| | | 374 | CARDIAC STRESSING AGENTS |
| 358 | | | METABOLIC AGENTS |
| | 19 | | ANTIHYPERLIPIDEMIC AGENTS |
| | | 173 | HMG-COA REDUCTASE INHIBITORS |
| | | 174 | MISCELLANEOUS ANTIHYPERLIPIDEMIC AGENTS |
| | | 241 | FIBRIC ACID DERIVATIVES |
| | | 316 | CHOLESTEROL ABSORPTION INHIBITORS |
| | 99 | | ANTIDIABETIC AGENTS |
| | | 213 | SULFONYLUREAS |
| | | 214 | BIGUANIDES |
| | | 215 | INSULIN |
| | | 216 | ALPHA-GLUCOSIDASE INHIBITORS |
| | | 271 | THIAZOLIDINEDIONES |
| | | 282 | MEGLITINIDES |
| | | 371 | DIPEPTIDYL PEPTIDASE 4 INHIBITORS |
| | 194 | | ANTIGOUT AGENTS |
| | 289 | | ANTIHYPERURICEMIC AGENTS |
| | 409 | | BONE RESORPTION INHIBITORS |
| | | 217 | BISPHOSPHONATES |
| 999 | | | INAPP |

**Pharmacologic Class Codes and Names**

The Pharmacologic Classification (PC) system is flat thus the classes are in numeric order by class code. This system does not include parent/child relationships, but drugs can be assigned to multiple pharmacologic categories. Within MIDUS/MIDJA medications can be assigned to up to 6 PC categories. See Section B above for more details.

| Multum Pharmacologic Classes | |
|---|---|
| Codes | Class Names |
| 918 | ALPHA1 AGONIST |
| 919 | ALPHA 1 BLOCKER |
| 928 | ALPHA-/BETA- AGONIST |
| 930 | ALPHA2-ADRENERGIC AGONIST |
| 934 | AMEBICIDE |
| 938 | 5-AMINOSALICYLIC ACID DERIVATIVE |
| 947 | ANALGESIC, NONOPIOID |
| 953 | ANALGESIC, MISCELLANEOUS |
| 957 | ANGIOTENSIN-CONVERTING ENZYME (ACE) INHIBITOR |
| 958 | ANGIOTENSIN II RECEPTOR BLOCKER |
| 961 | ANTACID |
| 971 | ANTIANGINAL AGENT |
| 976 | ANTIARRHYTHMIC AGENT, CLASS IB |
| 979 | ANTIARRHYTHMIC AGENT, CLASS III |
| 980 | ANTIARRHYTHMIC AGENT, CLASS IV |
| 983 | ANTIARRHYTHMIC AGENT, MISCELLANEOUS |
| 994 | ANTIBIOTIC, CEPHALOSPORIN (FIRST GENERATION) |
| 995 | ANTIBIOTIC, CEPHALOSPORIN (SECOND GENERATION) |
| 1002 | ANTIBIOTIC, MACROLIDE |
| 1004 | ANTIBIOTIC, OPHTHALMIC |
| 1009 | ANTIBIOTIC, QUINOLONE |
| 1011 | ANTIBIOTIC, SULFONAMIDE DERIVATIVE |
| 1017 | ANTIBIOTIC, MISCELLANEOUS |
| 1019 | ANTICHOLINERGIC AGENT |
| 1023 | ANTICOAGULANT, COUMARIN DERIVATIVE |
| 1032 | ANTICONVULSANT, MISCELLANEOUS |
| 1044 | ANTIDEPRESSANT, ALPHA-2 ANTAGONIST |

| Codes | Class Names |
|---|---|
| 1050 | ANTIDEPRESSANT, SELECTIVE SEROTONIN REUPTAKE INHIBITOR |
| 1051 | ANTIDEPRESSANT, SEROTONIN/NOREPINEPHRINE REUPTAKE INHIBITOR |
| 1052 | ANTIDEPRESSANT, SEROTONIN REUPTAKE INHIBITOR/ANTAGONIST |
| 1054 | ANTIDEPRESSANT, TETRACYCLIC |
| 1057 | ANTIDEPRESSANT, TRICYCLIC (SECONDARY AMINE) |
| 1058 | ANTIDEPRESSANT, TRICYCLIC (TERTIARY AMINE) |
| 1062 | ANTIDIABETIC AGENT, ALPHA-GLUCOSIDASE INHIBITOR |
| 1063 | ANTIDIABETIC AGENT, BIGUANIDE |
| 1065 | ANTIDIABETIC AGENT, SULFONYLUREA |
| 1066 | ANTIDIABETIC AGENT, THIAZOLIDINEDIONE |
| 1069 | ANTIDIARRHEAL |
| 1074 | ANTIDOTE |
| 1124 | ANTIFIBRINOLYTIC AGENT |
| 1130 | ANTIFUNGAL AGENT, ORAL |
| 1134 | ANTIFUNGAL AGENT, TOPICAL |
| 1138 | ANTIGOUT AGENT |
| 1139 | ANTIHEMOPHILIC AGENT |
| 1156 | ANTIHYPERTENSIVE |
| 1165 | ANTI-INFLAMMATORY AGENT, OPHTHALMIC |
| 1170 | ANTILIPEMIC AGENT, FIBRIC ACID |
| 1171 | ANTILIPEMIC AGENT, HMG-COA REDUCTASE INHIBITOR |
| 1174 | ANTIMANIC AGENT |
| 1177 | ANTIMIGRAINE AGENT |
| 1195 | ANTINEOPLASTIC AGENT, AROMATASE INHIBITOR |
| 1219 | ANTI-PARKINSON'S AGENT, ANTICHOLINERGIC |
| 1225 | ANTIPLATELET AGENT |
| 1259 | ANTIRHEUMATIC, DISEASE MODIFYING |
| 1267 | ANTITUBERCULAR AGENT |
| 1277 | ANTIVIRAL AGENT |
| 1280 | ANTIVIRAL AGENT, ORAL |
| 1289 | BENZODIAZEPINE |
| 1291 | BETA-BLOCKER, BETA-1 SELECTIVE |
| 1293 | BETA-BLOCKER, NONSELECTIVE |
| 1294 | BETA-BLOCKER WITH ALPHA-BLOCKING ACTIVITY |
| 1299 | BETA2 AGONIST |
| 1305 | BISPHOSPHONATE DERIVATIVE |

| Codes | Class Names |
|---|---|
| 1313 | CALCIUM CHANNEL BLOCKER |
| 1314 | CALCIUM SALT |
| 1318 | CARDIAC GLYCOSIDE |
| 1363 | CORTICOSTEROID, INHALANT (ORAL) |
| 1364 | CORTICOSTEROID, NASAL |
| 1365 | CORTICOSTEROID, OPHTHALMIC |
| 1366 | CORTICOSTEROID, OTIC |
| 1369 | CORTICOSTEROID, SYSTEMIC |
| 1370 | CORTICOSTEROID, TOPICAL |
| 1380 | DECONGESTANT |
| 1387 | DEPIGMENTING AGENT |
| 1390 | DIAGNOSTIC AGENT |
| 1428 | DIETARY SUPPLEMENT |
| 1435 | DIURETIC, LOOP |
| 1437 | DIURETIC, OSMOTIC |
| 1438 | DIURETIC, POTASSIUM SPARING |
| 1439 | DIURETIC, THIAZIDE |
| 1447 | ELECTROLYTE SUPPLEMENT, ORAL |
| 1448 | ELECTROLYTE SUPPLEMENT, PARENTERAL |
| 1449 | ENZYME |
| 1481 | GALLSTONE DISSOLUTION AGENT |
| 1488 | GASTROINTESTINAL AGENT, MISCELLANEOUS |
| 1504 | HEMOSTATIC AGENT |
| 1507 | HISTAMINE H2 ANTAGONIST |
| 1523 | HYPNOTIC, MISCELLANEOUS |
| 1528 | IMMUNOSUPPRESSANT AGENT |
| 1534 | IRON SALT |
| 1536 | KERATOLYTIC AGENT |
| 1539 | LAXATIVE, BULK-PRODUCING |
| 1545 | LAXATIVE, STIMULANT |
| 1551 | LEUKOTRIENE RECEPTOR ANTAGONIST |
| 1576 | MAGNESIUM SALT |
| 1596 | NEUROMUSCULAR BLOCKER AGENT, NONDEPOLARIZING |
| 1599 | NONSTEROIDAL ANTI-INFLAMMATORY DRUG (NSAID) |
| 1600 | NONSTEROIDAL ANTI-INFLAMMATORY DRUG (NSAID), COX-2 SELECTIVE |
| 1602 | NONSTEROIDAL ANTI-INFLAMMATORY DRUG (NSAID), ORAL |

| Codes | Class Names |
|---|---|
| 1603 | NONSTEROIDAL ANTI-INFLAMMATORY DRUG (NSAID), PARENTERAL |
| 1604 | NUTRITIONAL SUPPLEMENT |
| 1607 | OPHTHALMIC AGENT, ANTIGLAUCOMA |
| 1609 | OPHTHALMIC AGENT, MYDRIATIC |
| 1613 | OPHTHALMIC AGENT, VISCOELASTIC |
| 1629 | PHOSPHATE BINDER |
| 1646 | PROSTAGLANDIN |
| 1651 | PROTON PUMP INHIBITOR |
| 1665 | SALICYLATE |
| 1671 | SELECTIVE ESTROGEN RECEPTOR MODULATOR (SERM) |
| 1687 | SKIN AND MUCOUS MEMBRANE AGENT, MISCELLANEOUS |
| 1710 | THYROID PRODUCT |
| 1712 | TOPICAL SKIN PRODUCT |
| 1718 | TRACE ELEMENT |
| 1742 | VASODILATOR |
| 1750 | VITAMIN |
| 1753 | VITAMIN, FAT SOLUBLE |
| 1756 | VITAMIN, WATER SOLUBLE |
| 1757 | XANTHINE OXIDASE INHIBITOR |
| 1762 | SEROTONIN 5-HT1B, 1D RECEPTOR AGONIST |
| 1768 | HISTAMINE H1 ANTAGONIST |
| 1779 | 5 ALPHA-REDUCTASE INHIBITOR |
| 1780 | SELECTIVE ALDOSTERONE BLOCKER |
| 1781 | ANTILIPEMIC AGENT, 2-AZETIDINONE |
| 1784 | PARATHYROID HORMONE ANALOG |
| 1814 | GONADOTROPIN RELEASING HORMONE AGONIST |
| 1820 | ANTIRHEUMATIC, MISCELLANEOUS |
| 1822 | ANTINEOPLASTIC AGENT, ANTIMETABOLITE (ANTIFOLATE) |
| 1823 | ANTIPROTOZOAL, NITROIMIDAZOLE |
| 1824 | SUBSTITUTED BENZIMIDAZOLE |
| 1825 | ANTISEPTIC, TOPICAL |
| 1827 | ANTIPSYCHOTIC AGENT, ATYPICAL |
| 1828 | ANTIPSYCHOTIC AGENT, TYPICAL |
| 1830 | AMINO ACID |
| 320122 | ANTISEPTIC, VAGINAL |
| 363221 | ANTIDIABETIC AGENT, MEGLITINIDE DERIVATIVE |

| Codes | Class Names |
|---|---|
| 370141 | INSULIN, RAPID-ACTING |
| 580286 | ANTIDIABETIC AGENT, DIPEPTIDYL PEPTIDASE IV (DPP-IV) INHIBITOR |
| 923978 | ANTINEOPLASTIC AGENT, GONADOTROPIN-RELEASING HORMONE AGONIST |
| 1118479 | RESPIRATORY FLUOROQUINOLONE |
| 1160459 | BETA2-ADRENERGIC AGONIST, LONG-ACTING |
| 1163619 | NONSTEROIDAL ANTI-INFLAMMATORY DRUG (NSAID), TOPICAL |
| 1177583 | HISTAMINE H1 ANTAGONIST, SECOND GENERATION |
| 1177584 | HISTAMINE H1 ANTAGONIST, FIRST GENERATION |
| 1232826 | VITAMIN K ANTAGONIST |
| 1284841 | HISTONE DEACETYLASE INHIBITOR |
| 1711459 | LYSINE ANALOG |
| 1797079 | CALCIUM CHANNEL BLOCKER, NONDIHYDROPYRIDINE |
| 1797080 | CALCIUM CHANNEL BLOCKER, DIHYDROPYRIDINE |
| 1801719 | CALCINEURIN INHIBITOR |
| 1826674 | ANTIPLATELET AGENT, THIENOPYRIDINE |
| 2952225 | ALKYLAMINE DERIVATIVE |
| 2952299 | ETHANOLAMINE DERIVATIVE |
| 2952340 | PIPERAZINE DERIVATIVE |
| 2952559 | PIPERIDINE DERIVATIVE |
| 2965759 | FIBER SUPPLEMENT |
| 3819764 | BETA3 AGONIST |
| 3861322 | PHOSPHODIESTERASE ENZYME INHIBITOR, NONSELECTIVE |
| 3861323 | PHOSPHODIESTERASE-3 ENZYME INHIBITOR |
| 3974202 | ANTILIPEMIC AGENT, OMEGA-3 FATTY ACIDS |
| 3988862 | ANTICHOLINERGIC AGENT, LONG-ACTING |
| 9999999 | INAPP |

## APPENDIX D: REASON FOR TAKING MEDICATIONS – CODES AND CATEGORY NAMES

This Appendix contains two lists of codes representing reasons why participants think they are taking medications reported on the Medication Chart (See Clinic Visit Documentation, Section E, Appendix A). The list of modified ICD-9 (__ICD9M) codes and category names is presented first and then the list of MIDUS (__MDC) codes and category names. See Section C above for details about the coding process. The lists begin on the next page.

**Modified ICD-9 Codes and Labels**

The ICD9M category labels are based on clinical descriptions of diseases etc., thus this table also contains a column listing key words/common phrases indicating the conditions/symptoms etc. included in a given category.

| ICD9M CODE | ICD9 CODE LABEL | Key Words/Common Responses |
|---|---|---|
| 10 | PRIMARY TUBERCULOUS INFECTION | Tuberculosis bacillus |
| 41 | BACT INF IN OTH DIS/NOS | Infectious disease |
| 42 | HUMAN IMMUNO VIRUS DIS | HIV |
| 53 | HERPES ZOSTER | Shingles |
| 54 | HERPES SIMPLEX | Cold sores, Herpes |
| 78 | OTHER VIRAL DISEASE | Warts |
| 110 | DERMATOPHYTOSIS | Athlete's foot, Toe nail fungus, Fungal infection, Ringworm |
| 112 | CANDIDIASIS | Yeast infection |
| 133 | SCABIES | Scabies |
| 150 | MALIGNANT NEOPLASM OF ESOPHAGUS | Esophagus cancer |
| 174 | MALIG NEO FEMALE BREAST | Breast cancer |
| 185 | MALIGN NEOPL PROSTATE | Prostate cancer |
| 188 | MALIGN NEOPL BLADDER | Bladder cancer |
| 211 | BENIGN NEOPLASM OF OTHER PARTS OF DIGESTIVE SYSTEM | Colon polyp |
| 212 | BENIGN NEOPLASM OF RESPIRATORY AND INTRATHORACIC ORGANS | Thymoma |
| 218 | UTERINE LEIOMYOMA | Fibroids, Myoma of uterus |
| 239 | UNSPECIFIED NEOPLASM | Cancer non-specific |
| 242 | TOXIC DIFFUSE GOITER | Grave's disease |

| ICD9M CODE | ICD9 CODE LABEL | Key Words/Common Responses |
|---|---|---|
| 244 | ACQUIRED HYPOTHYROIDISM | Hypothyroidism, Thyroiditis |
| 246 | OTH DISORDERS OF THYROID | Thyroid hormone, Thyroid |
| 250 | DIABETES MELLITUS | Diabetes, High blood sugar |
| 251 | OTH PANCREATIC DISORDER | Hypoglycemia |
| 255 | ADRENAL GLAND DISORDERS | Adrenal gland disorder, Adrenal gland dysfunction |
| 257 | TESTICULAR DYSFUNCTION | Low testosterone levels |
| 259 | OTH ENDOCRINE DISORDERS | Imbalance in endocrine system |
| 266 | B-COMPLEX DEFICIENCIES | Low B12 |
| 267 | ASCORBIC ACID DEFICIENCY | Vitamin C deficiency |
| 268 | VITAMIN D DEFICIENCY | Rickets, Low Vitamin D, Vitamin D deficiency |
| 269 | OTH NUTRITION DEFICIENCY | Iodine deficiency, calcium deficiency |
| 272 | PURE HYPERCHOLESTEROLEM | High cholesterol, Hyperlipidaemia, High neutral lipid, |
| 274 | GOUT | Gout |
| 275 | DIS MINERAL METABOLISM | Magnesium supplement, Reduce phosphate, Supplement iron |
| 276 | FLUID/ELECTROLYTE DIS | Low potassium, Hypokalemia |
| 281 | PERNICIOUS ANEMIA | Pernicious anemia |
| 285 | ANEMIA NEC/NOS | Anemia |
| 287 | PURPURA & OTH HEMOR COND | Low platelet count |
| 295 | SCHIZOPHRENIC DISORDERS | Schizophrenia |
| 296 | AFFECTIVE PSYCHOSES | Bipolar disorder, Mood swings |
| 297 | DELUSIONAL DISORDERS | Hallucinations, Paranoia, Ease up on symptoms of delusion |

| ICD9M CODE | ICD9 CODE LABEL | Key Words/Common Responses |
|---|---|---|
| 298 | OTH NONORGANIC PSYCHOSES | Psychosis |
| 300 | NEUROTIC DISORDERS | Tranquilizer, Stay calm, Anxiety, nervousness, 'Stabilizer' |
| 302 | SEXUAL DISORDERS | Impotence, Erectile Dysfunction |
| 304 | DRUG DEPENDENCE | Heroin addiction maintenance |
| 305 | NONDEPENDENT DRUG ABUSE | Smoking cessation |
| 309 | ADJUSTMENT REACTION | PTSD |
| 311 | DEPRESSIVE DISORDER NEC | Depression, Anti-depressant |
| 314 | HYPERKINETIC SYNDROME | ADD, ADHD |
| 323 | ENCEPHALITIS, MYELITIS, AND ENCEPHALOMYELITIS | Myelitis |
| 331 | CEREBRAL DEGENERATION | Alzheimer's |
| 332 | PARKINSON'S DISEASE | Parkinson's disease |
| 333 | EXTRAPYRAMIDAL DIS NEC | Restless leg syndrome, Tick in eye, Tremors, Huntington's disease |
| 337 | AUTONOMIC NERVE DISORDER | Treat disorder of peripheral nerve, Neuropathy in heart |
| 338 | PAIN, NOT ELSEWHERE CLASSIFIED | Pain, Pain in multiple locations, |
| 340 | MULTIPLE SCLEROSIS | MS, Multiple sclerosis, Muscle fatigue |
| 345 | EPILEPSY | Epilepsy, Seizure disorder, Focal seizures |
| 346 | MIGRAINE | Migraine |
| 347 | CATAPLEXY AND NARCOLEPSY | Narcolepsy |
| 349 | CNS DISORDER NEC/NOS | Neurological problems |
| 350 | TRIGEMINAL NERVE DISORDERS | Trigeminal neuralgia |
| 354 | CARPAL TUNNEL SYNDROME | Carpal Tunnel |

| ICD9M CODE | ICD9 CODE LABEL | Key Words/Common Responses |
|---|---|---|
| 356 | HERED & IDIOPATH PERIPH NEUROPATHY | Improvement of peripheral nervous system, |
| 361 | RETINAL DETACHMENTS AND DEFEATS | Retina detachment |
| 362 | RETINAL DISORDERS NEC | Macular degeneration |
| 365 | GLAUCOMA | Glaucoma, pressure in eye, lower ocular pressure |
| 366 | CATARACT | Cataract |
| 370 | KERATITIS | Ulcer in eye |
| 371 | CORNEAL OPACITY/DISORDER | Corneal problem |
| 372 | DISORDERS OF CONJUNCTIVA | Prevent eye infection |
| 373 | INFLAMMATION OF EYELIDS | Sty, Blepharitis |
| 375 | LACRIMAL SYSTEM DISORDER | Dry eyes, Lacrimal gland disorder |
| 379 | EYE DISORDERS NEC | Inflammation of eye, Itchy eyes |
| 380 | DISORDER OF EXTERNAL EAR | Ear infection |
| 386 | VERTIGINOUS SYNDROMES | Meniere's disease, Inner ear |
| 388 | DISORDERS OF EAR NEC | Ringing ears, Tinnitis, Ear pain, Dry ear |
| 389 | HEARING LOSS | Helps with hearing, Hearing loss |
| 401 | ESSENTIAL HYPERTENSION | High blood pressure, Hypertension, Reduce/lower blood pressure, Blood pressure, Anti-hypertensive |
| 410 | ACUTE MYOCARDIAL INFARCT | Myocardial infarction, Cardiac infarction |
| 413 | ANGINA PECTORIS | Angina pectoris, Angina |
| 414 | OTH CHR ISCHEMIC HRT DIS | Arterial Sclerosis |
| 424 | OTH ENDOCARDIAL DISEASE | Mitral stenosis, Prolapsed mitral valve |
| 427 | CARDIAC DYSRHYTHMIAS | Irregular pulse, Atrial fibrillation |
| 428 | HEART FAILURE | Heart Failure |

| ICD9M CODE | ICD9 CODE LABEL | Key Words/Common Responses |
|---|---|---|
| 429 | ILL-DEFINED HEART DIS | Cardiac disease, Heart dilation, Dysraphism of aortic valve |
| 431 | INTRACEREBRAL HEMORRHAGE | Intracerebral hemorrhage, Brain hemorrhage |
| 434 | CEREBRAL ARTERY OCCLUS | Cerebral infarction sequelae, Cerebral thrombosis, Mini stroke |
| 435 | TRANSIENT CEREB ISCHEMIA | TIA |
| 441 | AORTIC ANEURYSM AND DISSECTION | Aortic aneurysm |
| 442 | OTHER ANEURYSM | Aneurysm |
| 443 | RAYNAUD'S SYNDROME | Raynaud's |
| 446 | POLYARTERIT NODOSA ET AL | Wegener's disease |
| 447 | OTHER ARTERIAL DISEASE | Twisted carotid artery, Vasculitis |
| 451 | THROMBOPHLEBITIS | Recurring phlebitis |
| 453 | OTH VENOUS THROMBOSIS | Anticoagulant, Thrombosis, Prevent thrombosis, Prevent blood clot, Thrombus |
| 455 | HEMORRHOIDS | Hemorrhoids |
| 460 | ACUTE NASOPHARYNGITIS | Treat Cold, Acute Upper respiratory infection |
| 461 | ACUTE SINUSITIS | Acute sinus problems, Post nasal drip, Nasal inflammation, Nasal mucus |
| 470 | DEVIATED NASAL SEPTUM | Deviated septum |
| 471 | NASAL POLYPS | Polyps in sinus |
| 472 | CHR PHARYNG/NASOPHARYNG | Rhinitis, Chronic nasal congestion, Reduce swelling of nasal passages |
| 473 | CHRONIC SINUSITIS | Chronic sinus |

| ICD9M CODE | ICD9 CODE LABEL | Key Words/Common Responses |
|---|---|---|
| 477 | ALLERGIC RHINITIS | Hay fever, Dust allergy, Allergic rhinitis |
| 478 | OTH UPPR RESPIRATORY DIS | Drippy/clogged nose |
| 486 | PNEUMONIA, ORGANISM NOS | Pneumonia |
| 487 | INFLUENZA | Flu |
| 490 | BRONCHITIS NOS | Bronchitis |
| 493 | ASTHMA | Asthma, Pulmonary emphysema, Emphysema |
| 496 | CHR AIRWAY OBSTRUCT NEC | COPD |
| 518 | OTHER LUNG DISEASES | Repair damage to lung |
| 523 | GINGIVAL/PERIODONTAL DIS | Gum disease/problems |
| 525 | OTHER DENTAL DISORDER | Extracted teeth, Treatment for a tooth, Toothache |
| 527 | SALIVARY GLAND DISEASES | Dry mouth |
| 528 | ORAL SOFT TISSUE DISEASE | Stomatitis, Chapped lips, Cankor sores, Dental abcess |
| 529 | TONGUE DISORDERS | Geographic tongue |
| 530 | DISEASES OF ESOPHAGUS | Acid Reflux, GERD, Gastritis, Esophagus trouble, Backward flow of gastric acid, |
| 531 | GASTRIC ULCER | Gastric ulcer |
| 532 | DUODENAL ULCER | Duodenal ulcer |
| 533 | PEPTIC ULCER, SITE NOS | Heliobacter pylori, Gastric & duodenal ulcer, Peptic Ulcer |
| 535 | GASTRITIS AND DUODENITIS | Inflammation of stomach |
| 536 | STOMACH FUNCTION DISORD | Gastric hyperacidity, Dyspepsia, Neutralize/reduce gastric acid, Stomach pain |
| 553 | OTHER ABDOMINAL HERNIA | Hernia, High hiatal hernia |

| ICD9M CODE | ICD9 CODE LABEL | Key Words/Common Responses |
|---|---|---|
| 555 | REGIONAL ENTERITIS | Chrohn's disease |
| 556 | IDIOPATHIC PROCTOCOLITIS | Colitis |
| 558 | OTH NONINF GASTROENTERIT | Diarrhea, Gastroenteritis |
| 562 | DIVERTICULA OF INTESTINE | Diverticulitis |
| 564 | FUNCT DIGESTIVE DIS NEC | Constipation, Bowel movement, Colon cramps, Irritable bowel |
| 569 | OTH INTESTINAL DISORDERS | Intestinal disorder, Inflammation of intestines, Proctitis, |
| 571 | CHR LIVER DIS/CIRRHOSIS | Liver disease, Primary biliary cirrhosis |
| 574 | CHOLELITHIASIS | Gall stone |
| 575 | OTHER DISORDERS OF GALLBLADDER | Gallbladder polyp |
| 583 | NEPHRITIS NOS | Lupus in kidneys |
| 585 | CHRONIC RENAL FAILURE | Kidney disease |
| 586 | RENAL FAILURE NOS | Renal failure |
| 590 | KIDNEY INFECTION | Kidney infection, antiobiotics for kidney |
| 592 | RENAL/URETERAL CALCULUS | Kidney stones, |
| 593 | OTH RENAL & URETERAL DIS | Prevention/help with renal insufficiency |
| 596 | OTHER BLADDER DISORDERS | Bladder tone, Neurogenic bladder |
| 599 | OTH URINARY TRACT DISOR | Urinary tract infection, UTI |
| 600 | HYPERPLASIA OF PROSTATE | Prostatic hypertrophy, Prostatic hyperplasia |
| 601 | PROSTATIC INFLAMMATION | Prostatitis, Enlarged prostate, Help reduce swelling of prostate |
| 608 | MALE GENITAL DIS NEC | Transitions |

| ICD9M CODE | ICD9 CODE LABEL | Key Words/Common Responses |
|---|---|---|
| 611 | OTHER BREAST DISORDERS | Breast pain |
| 625 | FEMALE GENITAL SYMPTOMS | Dysmenorrhea, Premenstrual tension |
| 626 | DISORDER OF MENSTRUATION | Menstrual pain, Irregular period, |
| 627 | MENOPAUSAL DISORDERS | Menopausal disorder, Balancing hormones, Stabilizer for menopause, Menopause |
| 628 | FEMALE INFERTILITY | Fertility, Prepare uterus |
| 686 | OTHER LOCAL INFECTIONS OF SKIN AND SUBCUTANEOUS TISSUE | Skin palmoplanter pustulosis |
| 691 | ATOPIC DERMATITIS AND RELATED CONDITIONS | Atopic dermatitis |
| 690 | ERYTHEMATOSQUAMOUS DERM | Dry scalp |
| 692 | CONTACT DERMATITIS | Eczema, Dermatitis, Poison Oak |
| 695 | ERYTHEMATOUS CONDITIONS | Rosacea, Lupus |
| 696 | PSORIASIS/LIKE DISORDERS | Psoriasis |
| 697 | LICHEN | Lichen |
| 698 | PRURITUS & LIKE COND | Itch, Itching |
| 702 | OTHER DERMATOSES | Actinic keratosis |
| 704 | HAIR & FOLLICLE DISEASE | Hair thinning |
| 705 | DISORDERS OF SWEAT GLANDS | Milialia |
| 706 | SEBACEOUS GLAND DISEASE | Acne |
| 707 | CHRONIC ULCER OF SKIN | Sores in ears (hearing aid), sores under arms |
| 708 | URTICARIA | Hives, Chronic urticaria |
| 709 | OTHER SKIN DISORDERS | Scar |
| 714 | RHEUMATOID & OTH INFLAMM POLYARTHROP | Rheumatoid arthritis, RA |
| 715 | OSTEOARTHROSIS ET AL | Osteoarthritis |

| ICD9M CODE | ICD9 CODE LABEL | Key Words/Common Responses |
|---|---|---|
| 716 | ARTHROPATHIES NEC/NOS | Arthritis, Arthritis pain |
| 718 | OTHER JOINT DERANGEMENT | Pain in hip |
| 719 | JOINT DISORDER NEC & NOS | Knee, shoulder, joint etc. pain or problem, Athralgia, |
| 722 | INTERVERTEBRAL DISC DIS | Degenerative spine condition |
| 723 | OTHER CERVICAL SPINE DIS | Cervical vertebra pain, Pinched nerve, Neck pain |
| 724 | BACK DISORDER NEC & NOS | Back pain, Sciatica, Lumbar canal stenosis, Back spasms |
| 726 | PERIPH ENTHESOPATHIES | Torn rotator cuff, Tendonitis of jaw |
| 727 | OTH DIS SYNOV/TEND/BURSA | Bursitis |
| 728 | DIS OF MUSCLE/LIG/FASCIA | Muscle spasm, |
| 729 | OTHER SOFT TISSUE DIS | Sore muscles, Leg pain/cramps, Muscle constriction, Rheumatism |
| 731 | OSTEITIS DEFORMANS | Paget's disease, Brittle bone |
| 730 | OSTEOMYELITIS, PERIOSTITIS, AND OTHER INFECTIONS INVOLVING BONE | Osteomyelitis |
| 733 | OTH BONE & CARTILAGE DIS | Osteoporosis, Osteopenia, pain in bone, low bone density |
| 745 | CARDIAC SEPTAL CLOS ANOM | Foramen ovale |
| 780 | GENERAL SYMPTOMS | Sleep aid, Nightsweats, Vas-vagal syncope, Sensitive to cold, Stiff, Giddy, Insomnia, Vertigo, Memory problems |
| 781 | NERV/MUSCULSKEL SYS SYMP | Tremor |
| | | |

| ICD9M CODE | ICD9 CODE LABEL | Key Words/Common Responses |
|---|---|---|
| 782 | SKIN/OTH INTEGUMENT SYMP | Rash, Numbness of feet/finger/legs, Reduce keloidosis, Reduce skin inflammation, Edema |
| 783 | NUTRIT/METAB/DEVEL SYMP | Anorexia, Weight loss, Appetite suppressant |
| 784 | SYMPTOMS INVOL HEAD/NECK | Headache, Sore throat |
| 785 | CARDIOVASCULAR SYS SYMP | Heart murmur |
| 786 | RESP SYS/OTH CHEST SYMP | Difficulty breathing, Loosen phlegm, Short breath, Whooping cough, Chest tightness |
| 787 | GI SYSTEM SYMPTOMS | Gassy, Heartburn, Nausea |
| 788 | URINARY SYSTEM SYMPTOMS | Urination disorder, Frequent urination, Urination trouble/problem, Bladder control |
| 789 | OTH ABDOMEN/PELVIS SYMP | Stomach spasm, Stomach cramp, Groin pain |
| 790 | NONSPECIFIC FINDINGS ON EXAMINATION OF BLOOD | High uric acid, Hyperuricemia |
| 795 | ABN HISTOLOG/IMMUNO FIND | Positive TB test |
| 805 | FRACTURE OF VERTEBRAL COLUMN WITHOUT MENTION OF SPINAL CORD INJURY | Broken back bone, |
| 919 | SUPERFICIAL INJ OTH SITE | Blisters |
| 957 | INJURY TO NERVE NEC/NOS | Nerve damage |
| 965 | POIS-ANALGESIC/ANTIPYRET | Counteract Naproxen |
| 993 | EFFECTS OF AIR PRESSURE | Altitude sickness |
| 994 | EFFECT EXTERNAL CAUS NEC | Motion sickness |
| 995 | CERTAIN ADVERSE EFF NEC | Inflammation, Food allergy, Allergy (non-specific) |
| 9996 | UNABLE TO CLASSIFY | |
| 9997 | DON'T KNOW | |

| ICD9M CODE | ICD9 CODE LABEL | Key Words/Common Responses |
|---|---|---|
| 9998 | MISSING | |
| 9999 | INAPP | |

**MIDUS Codes and Labels**

To assist users in understanding the type of responses in the MIDUS code categories this table also contains a column listing key words/common phrases used to assign a response to a given category. Note all the MIDUS codes are alphanumeric and begin with an "M" followed by a 4 digit numeric code. The exception is the codes for Unable to Classify, Don't Know, Missing, and INAPP which begin with a "Z" and the usual missing value codes.

| MIDUS CODE | MIDUS CODE LABEL | Key words/Common Phrases |
|---|---|---|
| M1000 | GENERAL HEALTH | Health, For health, Maintain Health |
| M1010 | IMPROVE HEALTH | Improve health, Strengthen the system, For healing, Recovery from (cancer, surgery, etc.), Getting better |
| M1020 | ENERGY | Gives me a boost, When feel run down, Increase energy, Improve drive, When tired |
| M1030 | GENERAL HEALTH, OTHERS | Beauty, Aging, Stay younger, Detox, Cleanse body |
| M2000 | SUPPLEMENT | Supplement (just the word) |
| M2010 | VITAMIN SUPPLEMENT | Lacking vitamins, To supply vitamins, Get balance of vitamins |
| M2020 | CALCIUM SUPPPLEMENT | Calcium, Need more calcium, Don't drink milk |
| M2030 | DIETARY SUPPLEMENT | Supplement diet, Balance diet needs |
| M2040 | ENSURE NUTRITIONAL INTAKES | Nutrient fortification, Add nutrients, Balance nutrition |
| M2050 | POOR DIET | Diet, Don't always eat well, Dietary reasons |
| M2060 | ANTIOXIDANT | Antioxidants, Help with free radicals, |
| M2070 | SUPPLEMENT, OTHERS | Iron pill, Resupply iron, Omega 3, Fiber, Probiotics |
| M3010 | CARDIOVASCULAR HEALTH | Heart health, Good for heart, Cardiovascular health |
| M3011 | CARDIOVASCULAR HEALTH, PREVENTIVE | Cardiac family history, prevent clots/stroke/heart attack/atherosclerosis |
| M3012 | CARDIOVASCULAR HEALTH, BLOOD THINNER | Blood thinner |
| M3013 | CARDIOVASCULAR HEALTH, OTHERS | Improve blood circulation, Neutral fat, |

| MIDUS CODE | MIDUS CODE LABEL | Key words/Common Phrases |
|---|---|---|
| M3020 | MUSCULOSKELETAL HEALTH | Bone health, Because of broken bones, Health leg and hip, |
| M3021 | BONE STRENGTH/DENSITY | Bone strength/density/loss/mass |
| M3022 | JOINT HEALTH | Healthy joints, Good for bones-joints, Maintain bone and joint health |
| M3023 | MUSCULOSKELETAL HEALTH, PREVENTIVE | Prevent bone loss, Prevent Osteoporosis |
| M3024 | MUSCULOSKELETAL HEALTH, OTHERS | Repair muscles, Get older legs weaken, Bone/Muscle |
| M3030 | DIGESTIVE HEALTH | Digestion, Break down food, Help digest food, Condition of my stomach |
| M3031 | INTESTINAL/COLON HEALTH | Colon health, Cleans out colon, Regularity, To condition intestinal functions, |
| M3032 | STOMACH ACID | Stomach Acid |
| M3040 | PROSTATE HEALTH | Prostate health, Prostate gland, Prostate problem, |
| M3050 | EYE HEALTH | Eye health, Good for eyes, Nutrients for eyes, Tired eyes, Eye problem, Uveal tract |
| M3060 | BRAIN HEALTH | Boost cognitive abilities, Memory, Good for your brain, Brain health, Brain function, Avoid senile brain, |
| M3070 | IMMUNE HEALTH | Boost/support immune system, Beneficial for immune system, |
| M3071 | PREVENT COLDS | Prevent catching cold, Improve sensitivity to colds |
| M3080 | INTEGUMENT HEALTH | Hair/Skin/Nail health, Dry skin/hair, For skin, To avoid tanning/sunburn, Liver spot, Rough hands |
| M3090 | OTHER TARGETED HEALTH | Low frequency reasons that cannot be assigned elsewhere (e.g. Multiple organ/system support (i.e. eye & bone, prevent cancer and strokes), Bladder protection, Protect liver from alcohol, Liver, Chronic illness) |

| MIDUS CODE | MIDUS CODE LABEL | Key words/Common Phrases |
|---|---|---|
| M4010 | MD RECOMMEND | Doctor suggested/prescribed/recommended/ "told me to" |
| M4020 | GOOD FOR YOU/ME | Good for me/you, Everyone says it's a good idea, Healthy thing to do, Heard it's good for you, saw on TV etc. |
| M4030 | FAMILY/FRIEND RECOMMEND | Friend, Family member, Mother, etc. recommended it, Spouse puts it out, |
| M5000 | WEIGHT LOSS | Lose weight, Weight management, Diet plan pills |
| M5100 | STRESS | For stress, helps with stress |
| M5200 | CONTRACEPTION | Birth Control, Prevent Pregnancy |
| Z9996 | UNABLE TO CLASSIFY | |
| Z9997 | DON'T KNOW | |
| Z9998 | MISSING | |
| Z9999 | INAPP | |