Add Health
The National Longitudinal Study of Adolescent to Adult Health

Medication Use – Biomarker Home Exam

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This document summarizes the rationale, equipment, measurement, and protocol procedures for the medication inventories collected during the Wave V Biomarker home exam. It also documents the protocol for assigning therapeutic classes to those medications. Whenever possible, data collection and methods in Wave V mirrored those of Wave IV to ensure comparability of data between waves. This document is one in a set of Wave V user guides. User guides are also available to describe protocols for the following biological measures in Wave V:

- Anthropometrics
- Cardiovascular Measures
- Baroreflex Sensitivity, & Hemodynamic Recovery
- Glucose Homeostasis
- Inflammation and Immune Function
- Lipids
- Renal Function

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1. Introduction

Data on respondent use of prescription and select over-the-counter (aspirin-containing and non-steroidal anti-inflammatory) medications were collected during the Wave V home exam. The process of collecting the prescription medication data, therapeutically classifying the prescription medications, and structuring a file of the therapeutic classifications for dissemination to users is described below.

2. General Overview of Data Collection

2.1 Biomarker Consent & Scheduled Home Exam

At the end of the Wave V Survey, respondents were asked if they would agree to participate in the Wave V home exam administered by a field examiner (FE), which included taking measurements and collecting a blood sample. If the participant agreed, FEs from the Add Health data collection partner (Section 2.2) scheduled a date and time for the home exam. Depending on participant and/or FE availability, the time between the Wave V Survey completion and the home exam ranged from days to years (see the time interval variable **H5TIMESE** in the *bdemo5* data set and codebook). Some respondents completed the home exam before completing the entire Wave V Survey, resulting in a negative time interval. There were two scenarios where this occurred:

a) Sample 1 respondents selected for administration of the modular questionnaire were asked to complete the biomarker consent section after completing Module A of the Web Questionnaire and Mail Questionnaire. These respondents could consent to and complete the home exam before continuing to complete Module B.[1]

b) Respondents who completed the Sample 1 non-response follow up (NRFU) abbreviated telephone interview could consent to and complete the home exam before completing the full Wave V Survey.[1]

2.2 Initial Contact

During a phone conversation confirming the interview appointment date and time, the FE notified the respondent that information on use of medications would be collected at the home exam. The FE also suggested that it would help to have their medications handy at that time of the exam so they could be recorded properly. Doing so also alerted the respondent to bring medication containers to the exam if it was not conducted at their residence.

2.3 Home Exam

All data were collected during home exams performed by FEs from two Add Health data collection partners: Examination Management Services, Inc. (2016-2017) and Hooper Holmes, Inc. (2018-2019). All FEs were trained and certified using a custom program specific to the Add Health protocol. FEs used a 7" Samsung Galaxy Tab 4 tablet to record and transmit data. An Add Health data collection application (Open Data Kit or ODK) installed on the tablet guided the FEs through the home exam protocol. In addition, FEs received a series of job aids, both on paper and on the tablet, to serve as quick reference guides when completing the protocol. Each tablet also contained an in-depth Add Health training manual that could be accessed at any time.

Prescription medications were inventoried after collecting anthropometric and cardiovascular measures, but before venous blood collection. The questions followed a preface read by the FE to the respondent:

> "*When we scheduled this visit, we said we would like to record all prescription medications that you have used in the past four weeks. These medications include solid and non-solid formulations that can be swallowed, inhaled, applied to the skin or hair, injected, implanted, or placed in the ears, eyes, nose, mouth, or any other part of the body.*"

This preface was followed by **Question 67**:

> "Have you taken any prescription medications in the last four weeks?"

If the respondent answered "Yes", the FE was presented with the following instruction:

"If the exam is being conducted in the respondent's home or the medications are conveniently available (e.g., in a purse) ask the respondent to assemble the medications or their containers now so that you can record information about them. If the respondent is unable or unwilling to assemble then now, ask him/her to list them from memory."

The FE recorded whether the respondent presented each medication or its container at the home exam or if they listed each medication name from memory. Next, the FE typed the name of each medication (up to fifty) into the tablet (Exhibit 1).
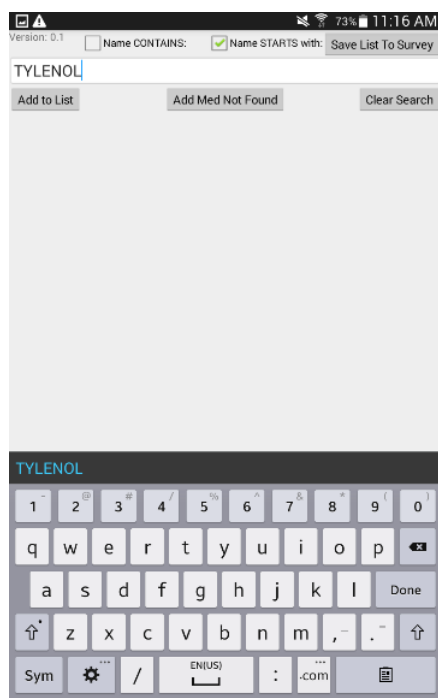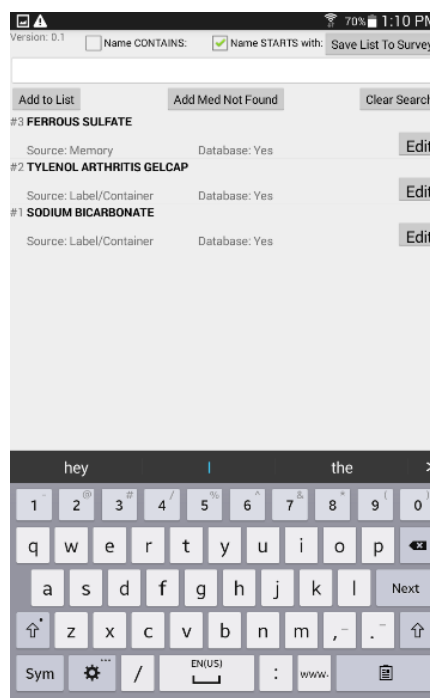

| **Exhibit 1** | **Exhibit 2** |

As the FE began typing each medication name, a look-up list of medications with identical or similar names was displayed on screen. The look-up list was based on a medication information and classification database (Multum Lexicon™, Cerner Multum, Inc.; Denver, CO) created by excerpting all generic and brand names included in the most current quarterly update. All tablets automatically detected and downloaded quarterly updates on Wi-Fi connection.

The FE had the choice of selecting medication names from the look-up list that "included" or "started with" the text that the FE entered. The FE highlighted and selected the name on the look-up list that matched each medication. In the absence of an identical match on the look-up list, the FE manually entered the unmatched name into a free-text data entry field. When all prescription medications were entered, the FE "Saved List to Survey" (Exhibit 2), thereby importing all entered prescription medications into the main ODK questionnaire database.

After the prescription medications were inventoried, the FE then asked the respondent two questions about whether they had taken either over-the-counter (OTC) aspirin-containing medications or OTC anti-inflammatory medications in the past 24 hours.

Question 69:

"In addition to the prescription medicines that I just asked about, have you taken any over-the-counter (OTC) aspirin or aspirin-containing medications including cold and allergy medications or headache powders in the past 24 hours? Some examples of these are: Anacin, Aspirin, B.C., Backache Relief Extra Strength, Bayer, Excedrin, Goody's Pain Relief, Pain Reliever Extra Strength, or Vanquish. Please DO NOT include any acetaminophen or anti-inflammatory medicines such as: Advil, Aleve, Ibuprofen, Midol, Motrin, or Tylenol."

Question 70:

"In the past 24 hours, have you taken other OTC anti-inflammatory medications? Common examples include: Advil, Aleve, Ibuprofen, Midol, Motrin, Naproxen, or Nuprin. Medications NOT to include: Anacin, Aspirin, B.C., Backache Relief Extra Strength, Bayer, Excedrin, Goody's Pain Relief, Pain Reliever Extra Strength, or Vanquish"

The respondent had the option of answering yes, no, or don't know to these two questions and affirmative answers have been captured in a combined variable called H5OTC24.

3. Therapeutic Classification of Prescription Medications (H5SET1 – H5SET4)

In 2019, Add Health executed a contract allowing for therapeutic classification of the prescription medications in the look-up list using an updated version of the Multum Lexicon™ (Cerner Multum, Inc.; Denver, CO). Of the 7,290 prescription medications reported by respondents, 27 (< 1%) could not be automatically assigned to a therapeutic class using this database. A general internist and cardiovascular epidemiologist with expertise in medication classification manually assigned therapeutic classes to 26 of the 27 prescription medications using two on-line coding databases (Lexi- Comp® On-Line™, Lexi-Comp®, Inc.; Hudson, OH and MICROMEDEX® 1.0, Thomson Reuters Healthcare, Inc; Philadelphia, PA). The Wave V home exam medication file therefore contains the therapeutic class for 7,289 prescription medications (Appendix 1).

In the data file, the nine-digit therapeutic classification codes associated with each prescription medication include a hierarchical series of up to three, three-digit codes representing, from left to right, the (general) therapeutic class, the (more specific) therapeutic subclass, and (most specific) therapeutic subgroup. For example, a prescription medication coded 001-009-161 is in the anti-infective class, cephalosporins subclass, and third generation cephalosporins subgroup. A prescription medication coded 001-018-*** is in the anti-infective class and aminoglycosides subclass. In other words, three, right-sided asterisks (***) in the nine-digit code indicate that subgrouping was impossible and six (***-***) indicate that both subclassification and subgrouping were impossible. A prescription medication coded 998-998-998 indicates that classification of the medication was impossible. A prescription medication coded 999-999-999 indicates that the respondent reported taking a prescription medication(s), but the medication(s) was not entered into the tablet.

Because the study did not collect indications for treatment and some prescription medications are used on- or off-label to treat a variety of conditions, each prescription medication may be associated with up to four unique, nine-digit therapeutic classification codes, i.e. Sets 1-4.

4. Key Therapeutic Classes of Prescription Medications

Use of a prescription medication in the past 4 weeks in one or more of the listed therapeutic classes was assigned a value of 1. Non-use of a prescription medication in the past four weeks in one of the listed therapeutic classes was assigned a value of 0. Therapeutically classified use of prescription medication in particular classes may confound biomarker-based estimates of disease prevalence or risk. For example, use of anti-hypertensive medications may confound blood pressure-based estimates of hypertension prevalence or cardiovascular disease risk. However, the following (1,0) classifications should be used cautiously in the investigation or control of potential confounding, because selection biases often threaten the study of non-randomized medication exposures.

4.1 Antihypertensive Medication Use (H5EAHT)

Respondents used ≥ 1 prescription medication in ≥ 1 of the following coded therapeutic classes:

Class	Label	Variable
040-042-***	Angiotensin converting enzyme (ACE) inhibitors	
040-043-***	Anti-adrenergic agents (peripherally acting)	
040-044-***	Anti-adrenergic agents (centrally acting)	
040-046-386 040-047-***	Beta-adrenergic blocking agents	
040-046-388 040-048-***	Calcium channel blocking agents	H5EAHT
040-049-156	Thiazide diuretics	
040-053-***	Vasodilators	
040-055-***	Antihypertensive Combinations	
040-056-***	Angiotensin II (AT2) inhibitors	

4.2 Antihyperlipidemic Medication Use (H5ECMED2)

Respondents used ≥ 1 prescription medication in ≥ 1 of the following coded therapeutic classes:

Class	Label	Variable
358-019-***	Antihyperlipidemic agents	
358-019-173	HMG-CoA reductase inhibitors	
358-019-174	Miscellaneous antihyperlipidemic agents	
358-019-241	Fibric acid derivatives	
358-019-252	Bile acid sequestrants	H5ECMED2
358-019-316	Cholesterol absorption inhibitors	
358-019-317	Antihyperlipidemic combinations	
358-019-484	PCSK9 inhibitors	

4.3 Antidiabetic Medication Use (H5ECMED)

Respondents used ≥ 1 prescription medication in ≥ 1 of the following coded therapeutic classes:

Class	Label	Variable
358-099-***	Antidiabetic agents	
358-099-213	Sulfonylureas	
358-099-214	Non-sulfonylureas	
358-099-215	Insulin	
358-099-216	Alpha-glucosidase inhibitors	
358-099-271	Thiazolidinediones	
358-099-282	Meglitinides	H5ECMED
358-099-309	Miscellaneous antidiabetic agents	
358-099-314	Antidiabetic combinations	
358-099-371	Dipeptidyl peptidase 4 inhibitors	
358-099-372	Amylin analogs	
358-099-373	Incretin mimetics	
358-099-458	SGLT-2 inhibitors	

4.4 Anti-Inflammatory Medication Use (H5ECRP1 – H5ECRP8)

Respondents used ≥ 1 medication identified by ≥ 1 of the following questions, coded therapeutic classes, or active ingredients:

Question / Class	Label	Variable
Q069=yes Q070=yes	Salicylate past 24 hours or Non-Steroidal Anti-Inflammatory Drug (NSAID) past 24 hours	H5ECRP1
057-058-061 057-058-062	NSAIDs past 4 weeks or Salicylate past 4 weeks or Any oral medication that contains NSAID or Salicylate as an active ingredient[1] in a combination medication past 4 weeks	H5ECRP2
057-058-278	Cyclooxygenase-2 (COX-2) Inhibitor past 4 weeks	H5ECRP3
122-130-296	Inhaled Corticosteroids past 4 weeks	H5ECRP4
097-098-300 097-098-301	Corticotropin or Glucocorticoid past 4 weeks	H5ECRP5
105-192-*** 105-270-***	Antirheumatic or Antipsoriatic past 4 weeks	H5ECRP6
254-104-***	Immunosuppressive agents	H5ECRP7
Any of the above	Any of the above anti-inflammatories	H5ECRP8

[1] Active Ingredients:

NSAIDS
- Bromfenac
- Diclofenac
- Diflunisal
- Etodolac
- Fenoprofen
- Flurbiprofen
- Ibuprofen
- Indomethacin
- Ketoprofen
- Ketorolac
- Meclofenamate
- Mefenamic Acid
- Meloxicam
- Nabumetone
- Naproxen
- Oxaprozin
- Piroxicam
- Sulindac
- Tolmetin

Salicylates
- Aspirin
- Choline salicylate
- Magnesium salicylate
- Salsalate
- Sodium salicylate
- Thiosalicylate

4.5 Narcotic Medication Use (H5ENARC)

Respondents used ≥ 1 opioid-containing prescription medication in ≥ 1 of the following coded therapeutic classes:

Class	Label	Variable
057-058-060	Narcotic analgesics	
057-058-191	Narcotic analgesic combinations	
057-073-179	Skeletal muscle relaxant combinations	H5ENARC
122-124-***	Antitussives	
122-132-***	Upper respiratory combinations	

--and--

the prescription medication contained ≥ 1 of the following active ingredients:

- Alfentanil
- Codeine
- Fentanyl
- Levomethadyl
- Methadone
- Opium
- Pentazocine
- Sufentanil
- Buprenorphine
- Dezocine
- Hydrocodone
- Levorphanol
- Morphine
- Oxycodone
- Propoxyphene
- Tapentadol
- Butorphanol
- Dihydrocodeine
- Hydromorphone
- Meperidine
- Nalbuphine
- Oxymorphone
- Remifentanil
- Tramadol

4.6 Antidepressant Medication Use (H5EADX, where X is defined below)

Respondents used ≥ 1 prescription medication in ≥ 1 of the following coded therapeutic classes:

Class	Label	Variable
242-079-***	Psychotherapeutic combinations	H5EADCMB
242-249-076	Miscellaneous antidepressants	H5EADMSC
242-249-208	Selective serotonin reuptake inhibitors	H5EADSRI
242-249-209	Tricyclic antidepressants	H5EADTRI
242-249-250	Monoamine oxidase inhibitors	H5EADMOI
242-249-306	Phenylpiperazine antidepressants	H5EADPHE
242-249-307	Tetracyclic antidepressants	H5EADTET
242-249-308	Selective serotonin norepinephrine reuptake inhibitors	H5EADSNR
Any of the above	Any of the above antidepressants	H5EADANY

4.7 Antipsychotic Medication Use (H5EAPS)

Respondents used ≥ 1 prescription medication in ≥ 1 of the following coded therapeutic classes:

Class	Label	Variable
242-079-***	Psychotherapeutic combinations	H5EAPS
242-251-***	Antipsychotic agents	
242-251-077	Miscellaneous antipsychotic agents	
242-251-210	Phenothiazine antipsychotics	
242-251-280	Thioxanthenes	
242-251-341	Atypical antipsychotics	

4.8 Anxiolytic, Sedative or Hypnotic Medication Use (H5EASH)

Respondents used ≥ 1 prescription medication in ≥ 1 of the following coded therapeutic classes:

Class	Label	Variable
057-067-***	Anxiolytic, sedative and hypnotic agents	H5EASH
057-067-068	Barbiturates	
057-067-069	Benzodiazepines	
057-067-070	Miscellaneous anxiolytics, sedatives and hypnotics	

4.9 Anticonvulsant Medication Use (**H5EACO**)

Respondents used ≥ 1 prescription medication in ≥ 1 of the following coded therapeutic classes:

Class	Label	Variable
057-064-***	Anticonvulsant agents	
057-064-199	Hydantoin anticonvulsants	
057-064-200	Succinimide anticonvulsants	
057-064-201	Barbiturate anticonvulsants	
057-064-202	Oxazolidinedione anticonvulsants	
057-064-203	Benzodiazepine anticonvulsants	
057-064-204	Miscellaneous anticonvulsants	
057-064-311	Dibenzazepine anticonvulsants	
057-064-345	Fatty acid derivative anticonvulsants	
057-064-346	Gamma-aminobutyric acid reuptake inhibitors	H5EACO
057-064-347	Gamma-aminobutyric acid analogs	
057-064-348	Triazine anticonvulsants	
057-064-349	Carbamate anticonvulsants	
057-064-350	Pyrrolidine anticonvulsants	
057-064-351	Carbonic anhydrase inhibitor anticonvulsants	
057-064-352	Urea anticonvulsants	
057-064-446	Neuronal potassium channel openers	
057-064-456	α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) receptor antagonists	

5. Quality Control of the Prescription Medication Data

Within a race/ethnicity- and sex-stratified random sample of 112 Add Health respondents among whom prescription medications were inventoried twice, on average 14.1 (95% confidence interval [CI]: 13.0-15.3) days apart, typically by the same FE and at approximately the same time of day, the agreement (95% CI) between therapeutic classifications was 85% (79%-92%), kappa coefficient (95% CI) = 0.82 (0.71-0.93). The observations suggest that home exam prescription medication data are reliable at Add Health Wave V.[2]

Of the 5,381 Add Health respondents who completed the Wave V home exam, 5,206 completed the prescription medication use inventory twice (during the home exam *and* the Wave V survey), albeit using somewhat different methods administered on average (95% confidence interval [CI]) 8.1 (7.9,8.3) months apart. The agreement (95% CI) between therapeutic classifications was nonetheless 64% (63%-65%) and kappa coefficient (95% CI) was 0.62 (0.60-0.64). The observations suggest that within Add Health Wave V, prescription medication data are comparable across the survey and the home exam.

6. The Medication Data File (bmeds5.xpt)

6.1 Structure

The structure of the disseminated medication data file is hierarchical. This means that it is a medication-level data file, where each therapeutically classified prescription medication and OTC medication appear in the data as single observations. Therefore, if a respondent reported taking more than one medication, the respondent's identifying number (AID variable) will appear in the data file more than once. Alternatively, the respondent's identifying number will appear in the data file just one time on a single observation if: (a) the respondent reported using just one medication, (b) the respondent reported not taking any medications, (c) the respondent refused to answer the medication questions, or (d) the exam was terminated before the medication questions could be asked of the respondent.

6.2 Respondent-Level Overview of the Medication Responses

Given the complex hierarchical structure of the data file, this section provides an overview, **at the respondent-level**, of the medications reported by the respondents:

Of the 5,381 respondents who participated in the home exam, 3,327 (61.8%) took either prescription medications or OTC medications, 2,028 (37.7%) took no medications, 3 (<1%) refused to answer, and 23 (< 1%) were not asked medication questions, because the exam had been terminated beforehand.

Of the 3,327 respondents who took medications, 1,940 (58.3%) took prescription medications only, 799 (24%) took both prescription and OTC medications, and 588 (17.7%) took OTC medications only (see the medication use variable **H5MEDUSE** in the *bdemo5* data set and codebook).

From the 2,739 respondents who had taken prescription medications, a total of 7,290 prescription medications were presented/listed. Of these prescription medications, 4,813 (66.0%) were physically presented (**H5MEDSRC**=*1*) and 2,477 (34.0%) were recalled from memory (**H5MEDSRC**=*2*).

6.3 Contents

The medication data file includes the variables below, which are described in the corresponding codebook documentation that also contains frequencies. Please note, however, that the frequencies reported in the codebook are at the medication-level and **not** at the respondent-level.

Variable Name	Variable Description
AID	Respondent Identifier
H5MEDSRC	Medication source (1=Label, 2=Memory)
H5SET1 – H5SET4	Therapeutic Classification Set #1 – #4
H5OTC24	Type of OTC medication taken in the past 24 hours
H5EAHT	Flag: Antihypertensive medication
H5ECMED2	Flag: Antihyperlipidemic medication
H5ECMED	Flag: Antidiabetic medication
H5ECRP1	Flag: CRP - NSAID/salicylate (24 hour) medication
H5ECRP2	Flag: CRP - NSAID/salicylate (4 weeks) medication
H5ECRP3	Flag: CRP - Cox-2 inhibitor medication
H5ECRP4	Flag: CRP - Inhaled corticosteroid medication
H5ECRP5	Flag: CRP - Corticotropin/Glucocorticoid medication
H5ECRP6	Flag: CRP - Antirheumatic/Antpsoriatic medication
H5ECRP7	Flag: CRP - Immunosuppressive medication
H5ECRP8	Flag: Any Anti-Inflammatory medication
H5ENARC	Flag: Narcotic medication
H5EADANY	Flag: Antidepressant medication
H5EADCMB	Flag: AD - Psychotherapeutic combinations
H5EADMSC	Flag: AD - Miscellaneous medication
H5EADSRI	Flag: AD - Selective serotonin reuptake inhibitors
H5EADTRI	Flag: AD - Tricyclic medication
H5EADMOI	Flag: AD - Monoamine oxidase inhibitors
H5EADPHE	Flag: AD - Phenylpiperazine medication
H5EADTET	Flag: AD - Tetracyclic medication
H5EADSNR	Flag: AD - Selective serotonin norepinephrine reuptake inhibitors
H5EAPS	Flag: Antipsychotic medication
H5EASH	Flag: Anxiolytic/Sedative/Hypnotic medication
H5EACO	Flag: Anticonvulsant medication
H5MEDTOT	# of Prescription Medications inventoried
H5MEDLAB	# of Prescription Medications reported from the label
H5MEDMEM	# of Prescription Medications recalled from memory
H5MEDMAN	# of Prescription Medications entered manually

Given all of the former complexities, Add Health users possessing no to little prior experience working with medication data are strongly advised to collaborate with a health care professional familiar with the challenges and pitfalls associated with doing so.

7. References

1. Harris KM, Halpern CT, Biemer P, Liao D, Dean SC. Sampling and Mixed-Mode Survey Design, 2019. Available from: https://doi.org/10.17615/v1vy-a536.

2. Hussey JM, Nguyen QC, Whitsel EA, Richardson LJ, Halpern CT, Gordon-Larsen P, Tabor JW, Entzel PP, Harris KM. The Reliability of In-home Measures of Height and Weight in Large Cohort Studies: Evidence from Add Health. Demogr Res 2015;32:1081-1098.

Appendix 1

Table. Therapeutic Classification Codes	
Code	**Name**
001	anti-infectives
002	amebicides
003	anthelmintics
004	antifungals
005	antimalarial agents
006	antituberculosis agents
007	antiviral agents
008	carbapenems
009	cephalosporins
010	leprostatics
011	macrolide derivatives
012	miscellaneous antibiotics
013	penicillins
014	quinolones
015	sulfonamides
016	tetracyclines
017	urinary anti-infectives
018	aminoglycosides
019	antihyperlipidemic agents
020	antineoplastics
021	alkylating agents
022	antineoplastic antibiotics
023	antimetabolites
024	antineoplastic hormones
025	miscellaneous antineoplastics
026	mitotic inhibitors
027	radiopharmaceuticals
028	biologicals
030	antitoxins and antivenins
031	bacterial vaccines
032	colony stimulating factors
033	immune globulins
034	in vivo diagnostic biologicals
036	erythropoiesis-stimulating agents
038	viral vaccines
040	cardiovascular agents
041	agents for hypertensive emergencies
042	angiotensin converting enzyme (ACE) inhibitors
043	antiadrenergic agents, peripherally acting

Table. Therapeutic Classification Codes	
Code	**Name**
044	antiadrenergic agents, centrally acting
045	antianginal agents
046	antiarrhythmic agents
047	beta-adrenergic blocking agents
048	calcium channel blocking agents
049	diuretics
050	inotropic agents
051	miscellaneous cardiovascular agents
052	peripheral vasodilators
053	vasodilators
054	vasopressors
055	antihypertensive combinations
056	angiotensin II inhibitors
057	central nervous system agents
058	analgesics
059	miscellaneous analgesics
060	narcotic analgesics
061	nonsteroidal anti-inflammatory agents
062	salicylates
063	analgesic combinations
064	anticonvulsants
065	antiemetic/antivertigo agents
066	antiparkinson agents
067	anxiolytics, sedatives, and hypnotics
068	barbiturates
069	benzodiazepines
070	miscellaneous anxiolytics, sedatives and hypnotics
071	CNS stimulants
072	general anesthetics
073	muscle relaxants
074	neuromuscular blocking agents
076	miscellaneous antidepressants
077	miscellaneous antipsychotic agents
079	psychotherapeutic combinations
080	miscellaneous central nervous system agents
081	coagulation modifiers
082	anticoagulants
083	antiplatelet agents
084	heparin antagonists
085	miscellaneous coagulation modifiers
086	thrombolytics

Table. Therapeutic Classification Codes	
Code	**Name**
087	gastrointestinal agents
088	antacids
089	anticholinergics/antispasmodics
090	antidiarrheals
091	digestive enzymes
092	gallstone solubilizing agents
093	GI stimulants
094	H2 antagonists
095	laxatives
096	miscellaneous GI agents
097	hormones/hormone modifiers
098	adrenal cortical steroids
099	antidiabetic agents
101	sex hormones
102	contraceptives
103	thyroid hormones
104	immunosuppressive agents
105	miscellaneous agents
106	antidotes
107	chelating agents
108	cholinergic muscle stimulants
109	local injectable anesthetics
110	miscellaneous uncategorized agents
111	psoralens
112	radiocontrast agents
113	genitourinary tract agents
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
124	antitussives
125	bronchodilators
126	methylxanthines
127	decongestants
128	expectorants
129	miscellaneous respiratory agents

Table. Therapeutic Classification Codes	
Code	**Name**
130	respiratory inhalant products
131	antiasthmatic combinations
132	upper respiratory combinations
133	topical agents
134	anorectal preparations
135	antiseptic and germicides
136	dermatological agents
137	topical anti-infectives
138	topical steroids
139	topical anesthetics
140	miscellaneous topical agents
141	topical steroids with anti-infectives
143	topical acne agents
144	topical antipsoriatics
146	mouth and throat products
147	ophthalmic preparations
148	otic preparations
149	spermicides
150	sterile irrigating solutions
151	vaginal preparations
153	plasma expanders
154	loop diuretics
155	potassium-sparing diuretics
156	thiazide and thiazide-like diuretics
157	carbonic anhydrase inhibitors
158	miscellaneous diuretics
159	first generation cephalosporins
160	second generation cephalosporins
161	third generation cephalosporins
162	fourth generation cephalosporins
163	ophthalmic anti-infectives
164	ophthalmic glaucoma agents
165	ophthalmic steroids
166	ophthalmic steroids with anti-infectives
167	ophthalmic anti-inflammatory agents
168	ophthalmic lubricants and irrigations
169	miscellaneous ophthalmic agents
170	otic anti-infectives
171	otic steroids with anti-infectives
172	miscellaneous otic agents
173	HMG-CoA reductase inhibitors (statins)

Table. Therapeutic Classification Codes	
Code	**Name**
174	miscellaneous antihyperlipidemic agents
175	protease inhibitors
176	NRTIs
177	miscellaneous antivirals
178	skeletal muscle relaxants
179	skeletal muscle relaxant combinations
180	adrenergic bronchodilators
181	bronchodilator combinations
182	androgens and anabolic steroids
183	estrogens
184	gonadotropins
185	progestins
186	sex hormone combinations
191	narcotic analgesic combinations
192	antirheumatics
193	antimigraine agents
194	antigout agents
195	5HT3 receptor antagonists
196	phenothiazine antiemetics
197	anticholinergic antiemetics
198	miscellaneous antiemetics
199	hydantoin anticonvulsants
200	succinimide anticonvulsants
201	barbiturate anticonvulsants
202	oxazolidinedione anticonvulsants
203	benzodiazepine anticonvulsants
204	miscellaneous anticonvulsants
205	anticholinergic antiparkinson agents
208	SSRI antidepressants
209	tricyclic antidepressants
210	phenothiazine antipsychotics
211	platelet aggregation inhibitors
212	glycoprotein platelet inhibitors
213	sulfonylureas
214	biguanides
215	insulin
216	alpha-glucosidase inhibitors
217	bisphosphonates
218	alternative medicines
219	nutraceutical products
220	herbal products

Table. Therapeutic Classification Codes	
Code	Name
222	penicillinase resistant penicillins
223	antipseudomonal penicillins
224	aminopenicillins
225	penicillins/beta-lactamase inhibitors
226	natural penicillins
227	NNRTIs
228	adamantane antivirals
229	purine nucleosides
230	aminosalicylates
231	thiocarbamide derivatives
232	rifamycin derivatives
233	streptomyces derivatives
234	miscellaneous antituberculosis agents
235	polyenes
236	azole antifungals
237	miscellaneous antifungals
238	antimalarial quinolines
239	miscellaneous antimalarials
240	lincomycin derivatives
241	fibric acid derivatives
242	psychotherapeutic agents
243	leukotriene modifiers
244	nasal lubricants and irrigations
245	nasal steroids
246	nasal antihistamines and decongestants
247	nasal preparations
248	topical emollients
249	antidepressants
250	monoamine oxidase inhibitors
251	antipsychotics
252	bile acid sequestrants
253	anorexiants
254	immunologic agents
256	interferons
261	heparins
262	coumarins and indanediones
263	erectile dysfunction agents
264	urinary antispasmodics
265	urinary pH modifiers
266	miscellaneous genitourinary tract agents
267	ophthalmic antihistamines and decongestants

Table. Therapeutic Classification Codes	
Code	**Name**
268	vaginal anti-infectives
269	miscellaneous vaginal agents
270	antipsoriatics
271	thiazolidinediones
272	proton pump inhibitors
273	lung surfactants
274	beta blockers, cardioselective
275	beta blockers, non-cardioselective
276	dopaminergic antiparkinsonism agents
277	5-aminosalicylates
278	cox-2 inhibitors
279	gonadotropin-releasing hormone and analogs
280	thioxanthenes
281	neuraminidase inhibitors
282	meglitinides
283	thrombin inhibitors
284	viscosupplementation agents
285	factor Xa inhibitors
286	mydriatics
287	ophthalmic anesthetics
288	5-alpha-reductase inhibitors
289	antihyperuricemic agents
290	topical antibiotics
291	topical antivirals
292	topical antifungals
293	glucose elevating agents
295	growth hormones
296	inhaled corticosteroids
297	mucolytics
298	mast cell stabilizers
299	anticholinergic bronchodilators
300	corticotropin
301	glucocorticoids
302	mineralocorticoids
303	agents for pulmonary hypertension
304	macrolides
305	ketolides
306	phenylpiperazine antidepressants
307	tetracyclic antidepressants
308	SSNRI antidepressants
310	echinocandins

Table. Therapeutic Classification Codes	
Code	Name
311	dibenzazepine anticonvulsants
312	cholinergic agonists
313	cholinesterase inhibitors
314	antidiabetic combinations
315	glycylcyclines
316	cholesterol absorption inhibitors
317	antihyperlipidemic combinations
318	insulin-like growth factor
319	vasopressin antagonists
320	smoking cessation agents
321	ophthalmic diagnostic agents
322	ophthalmic surgical agents
324	antineoplastic interferons
325	sclerosing agents
327	antiviral combinations
328	antimalarial combinations
329	antituberculosis combinations
330	antiviral interferons
332	radiologic adjuncts
333	miscellaneous iodinated contrast media
334	lymphatic staining agents
335	magnetic resonance imaging contrast media
336	non-iodinated contrast media
337	ultrasound contrast media
338	diagnostic radiopharmaceuticals
339	therapeutic radiopharmaceuticals
340	aldosterone receptor antagonists
341	atypical antipsychotics
342	renin inhibitors
345	fatty acid derivative anticonvulsants
346	gamma-aminobutyric acid reuptake inhibitors
347	gamma-aminobutyric acid analogs
348	triazine anticonvulsants
349	carbamate anticonvulsants
350	pyrrolidine anticonvulsants
351	carbonic anhydrase inhibitor anticonvulsants
352	urea anticonvulsants
353	anti-angiogenic ophthalmic agents
354	H. pylori eradication agents
355	functional bowel disorder agents
356	serotoninergic neuroenteric modulators

Table. Therapeutic Classification Codes	
Code	Name
357	growth hormone receptor blockers
358	metabolic agents
359	peripherally acting antiobesity agents
360	lysosomal enzymes
361	miscellaneous metabolic agents
362	chloride channel activators
363	probiotics
364	antiviral chemokine receptor antagonist
366	integrase strand transfer inhibitor
368	non-ionic iodinated contrast media
369	ionic iodinated contrast media
370	otic steroids
371	dipeptidyl peptidase 4 inhibitors
372	amylin analogs
373	GLP-1 receptor agonists
374	cardiac stressing agents
375	peripheral opioid receptor antagonists
376	radiologic conjugating agents
377	prolactin inhibitors
378	drugs used in alcohol dependence
379	fifth generation cephalosporins
380	topical debriding agents
381	topical depigmenting agents
382	topical antihistamines
383	antineoplastic detoxifying agents
384	platelet-stimulating agents
385	group I antiarrhythmics
386	group II antiarrhythmics
387	group III antiarrhythmics
388	group IV antiarrhythmics
389	group V antiarrhythmics
390	hematopoietic stem cell mobilizer
392	otic anesthetics
393	cerumenolytics
394	topical astringents
395	topical keratolytics
397	multikinase inhibitors
398	BCR-ABL tyrosine kinase inhibitors
399	CD52 monoclonal antibodies
400	CD33 monoclonal antibodies
401	CD20 monoclonal antibodies

Table. Therapeutic Classification Codes	
Code	**Name**
402	VEGF/VEGFR inhibitors
403	mTOR inhibitors
404	EGFR inhibitors
405	HER2 inhibitors
406	glycopeptide antibiotics
407	inhaled anti-infectives
408	histone deacetylase inhibitors
409	bone resorption inhibitors
410	adrenal corticosteroid inhibitors
411	calcitonin
412	uterotonic agents
413	antigonadotropic agents
414	antidiuretic hormones
415	miscellaneous bone resorption inhibitors
416	somatostatin and somatostatin analogs
417	selective estrogen receptor modulators
418	parathyroid hormone and analogs
419	gonadotropin-releasing hormone antagonists
420	antiandrogens
422	antithyroid agents
423	aromatase inhibitors
424	estrogen receptor antagonists
426	synthetic ovulation stimulants
427	tocolytic agents
428	progesterone receptor modulators
430	anticholinergic chronotropic agents
431	anti-CTLA-4 monoclonal antibodies
432	vaccine combinations
433	catecholamines
435	selective phosphodiesterase-4 inhibitors
437	immunostimulants
438	interleukins
439	other immunostimulants
440	therapeutic vaccines
441	calcineurin inhibitors
442	TNF alpha inhibitors
443	interleukin inhibitors
444	selective immunosuppressants
445	other immunosuppressants
446	neuronal potassium channel openers
447	CD30 monoclonal antibodies

Table. Therapeutic Classification Codes	
Code	**Name**
448	topical non-steroidal anti-inflammatories
449	hedgehog pathway inhibitors
450	topical antineoplastics
451	topical photochemotherapeutics
452	CFTR modulators
453	topical rubefacient
454	proteasome inhibitors
455	guanylate cyclase-C agonists
456	AMPA receptor antagonists
457	hydrazide derivatives
458	SGLT-2 inhibitors
459	urea cycle disorder agents
460	phosphate binders
461	topical anti-rosacea agents
462	allergenics
463	protease-activated receptor-1 antagonists
464	miscellaneous diagnostic dyes
465	diarylquinolines
467	ACE inhibitors with thiazides
468	antiadrenergic agents (central) with thiazides
469	antiadrenergic agents (peripheral) with thiazides
470	miscellaneous antihypertensive combinations
472	beta blockers with thiazides
473	angiotensin II inhibitors with thiazides
475	potassium sparing diuretics with thiazides
476	ACE inhibitors with calcium channel blocking agents
479	angiotensin II inhibitors with calcium channel blockers
480	antiviral boosters
481	NK1 receptor antagonists
482	angiotensin receptor blockers and neprilysin inhibitors
484	PCSK9 inhibitors
485	NS5A inhibitors
486	oxazolidinone antibiotics
487	CFTR combinations
488	anticoagulant reversal agents
489	CD38 monoclonal antibodies
490	peripheral opioid receptor mixed agonists/antagonists
491	local injectable anesthetics with corticosteroids
492	cephalosporins/beta-lactamase inhibitors
493	anti-PD-1 monoclonal antibodies
494	PARP inhibitors

Table. Therapeutic Classification Codes	
Code	Name
495	calcimimetics
496	VMAT2 inhibitors
497	cation exchange resins
498	antineoplastic combinations
499	carbapenems/beta-lactamase inhibitors
500	PI3K inhibitors
501	CDK 4/6 inhibitors
502	CGRP inhibitors
503	streptogramins
504	antimanic agents