

Diagnosis Grouping System Excel Program Instructions

Introduction

To facilitate use of the Diagnosis Grouping System (DGS), an Excel program is available for download at <http://www.pecarn.org/tools/index.html>. The program was developed in Microsoft Office Excel 2003 for Windows and may not function on older versions of Excel.

The DGS was created in order to group diagnoses found commonly in Pediatric Emergency Medicine (PEM) into clinically relevant categories for research and reporting. The DGS includes 21 Major groups. Most Major groups have Subgroups (77 total Subgroups within the DGS) to provide further diagnosis specificity. In addition, Subgroups within different Major Groups that have a common clinical thread are aggregated into Combined Common Subgroups. (For example, the 16 Infectious Diseases subgroups may be aggregated into one Infectious Disease combined subgroup.) The program also assigns a five-level severity score to each diagnosis based on intensity of resources required for that diagnosis. Both systems utilize the 2002 International Classification of Diseases Version 9 Clinical Modification (ICD-9-CM) diagnosis codes.

The program contains seven worksheets:

Individual Diagnosis Look-up: Allows users to enter an individual ICD-9-CM code in order to determine the DGS Major group, Subgroup, Combined Common Subgroup, and Severity Score to which the diagnosis has been assigned.

Multiple Diagnosis Look-up: Allows users to enter a series of ICD-9-CM codes (maximum of 65,535) to determine DGS group assignments.

Major Group Summary: Provides aggregate summaries of data entered into the *Multiple Diagnosis Look-up* sheet. The frequency distribution for DGS Major Group categorizations is summarized in this table for your list of diagnoses.

Subgroup Summary: Provides aggregate summaries of data entered into the *Multiple Diagnosis Look-up* sheet. The frequency distribution for DGS Subgroup categorizations is summarized in this table for your list of diagnoses.

Combined Common Group Summary: Provides aggregate summaries of data entered into the *Multiple Diagnosis Look-up* sheet. The frequency distribution for

DGS Combined Common Group categorizations is summarized in this table for your list of diagnoses.

Severity Scores Summary: Provides aggregate summaries of data entered into the *Multiple Diagnosis Look-up* sheet. The frequency distribution for five-level severity score to each diagnosis is summarized in this table for your list of diagnoses.

ICD9_Master: Contains a complete list of ICD-9-CM codes in the DGS along with their four associated DGS category assignments. This information is for reference and was used to create the look up formulas in the various worksheets.

Getting Started

After downloading the Excel file to a local drive, open the file using Excel version 2003 or later. The file should open to the *Individual Diagnosis Look-up* sheet.

The following are general guidelines for formatting of ICD codes for the DGS program. DGS is based on 2002 *International Classification of Diseases, 9th Revision*. Only valid 2002 ICD-9 codes represented as a 3 to 5 alphanumeric code **with** leading zeros and **without** decimals and found commonly in pediatric emergency medicine have been categorized in the DGS (2,688 codes). Valid 2002 ICD codes that are not found in the DGS will be designated "Not Categorized." Codes that are not formatted correctly, invalid codes, or codes introduced after 2002 will be designated as "ICD-9 Code Not Found." Records that have a missing ICD-9 code are listed as blank.

Examples of valid ICD-9-CM alphanumeric codes with leading zeroes and without decimals are:

ICD-9-CM Code Description	Valid ICD-9-CM Diagnosis Code	Valid 3 to 5 character Alphanumeric Code without Decimals
Septicemia	038	038
Septicemia due to other gram-negative organisms	038.4	0384
Septicemia due to serratia	038.49	03849

Individual Diagnosis Look Up Table

In the cell titled *Please enter valid ICD9 code*, type a valid ICD-9 code as described above. Upon entering a code, the remaining fields will populate with the various DGS categorizations. This sheet has a table with ICD-9 Code and ICD-9 Code descriptions, as well as descriptions and abbreviations for the Major Groups, Subgroups, Combined Common Subgroups. Finally, Severity Classification assignment is provided.

The use of the *Individual Diagnosis Look-up* sheet is illustrated in these examples.

Example 1: Type “0339” (Whooping cough, unspecified organism) for the ICD-9 code 033.9. Program output includes the ICD-9 Code Description: Whooping cough, unspecified organism; Major Group Description: Respiratory Diseases; Subgroup Description: Infectious Respiratory Diseases; and Combined Common Subgroup: Infectious Disease.

Example 2: Type “033.9” for the ICD9 code. This will return “invalid” for all fields.

Example 3: Type “033” for the ICD9 code. This will return “(Invalid: Additional digit required) Whooping cough” for the ICD9 Code Description field and “Invalid: Additional digit required” for the group descriptions.

Example 4: Type “485” for the ICD code. This will return “bronchopneumonia, organism unspecified” for the ICD9 Code description and its corresponding DGS classifications. Note that this is a valid 3 digit code and no digits trail a decimal place.

Example 5: Type “49300” for the ICD code. This will return “extrinsic asthma, unspecified” for the ICD9 code description and its corresponding DGS classifications. Note that it is necessary to include the two zeroes after the decimal place in this code as they are meaningful to its definition. If 493 alone were entered, the resulting classification would denote an invalid code.

Example 6: Type “1625” (Malignant neoplasm of lower lobe, bronchus, or lung). This will return an ICD9 code description of “Malignant neoplasm of lower lobe, bronchus, or lung”. As this is not a common pediatric emergency department diagnoses, the group descriptions are “Not Categorized” indicating that this is a code not categorized by DGS.

Example 7: Type “2859” (Unspecified anemia) for the ICD9 code. This will return the corresponding Major and Subgroups, but a “Not Applicable” value for the

Combined Common Subgroup field indicating that the DGS Subgroup for this code was not combined with other subgroups.

Multiple Diagnosis Look-up

To look up more than one ICD-9 code simultaneously, click on the tab at the bottom of the screen entitled *Multiple DX Look-up*. A maximum of 65,535 diagnoses may be entered. There are 7 columns in this sheet: Unique_ID, ICD9_Code, ICD9 Code Description, Major Group Description, Subgroup Description, Combined Common Subgroup, and Severity Classification assignment. The sheet is currently populated with 30 ICD-9-CM codes and their associated descriptions. These example records will allow you to practice with the Summary Table options described below.

In order to run the DGS program on your data, it is required that you insert a Unique_ID in the first column to obtain accurate counts in Summary Table worksheet. The second column must contain ICD-9 codes in text format, using 3 to 5 character alphanumeric codes with leading zeros and without decimals, as described above. The remaining columns will self-populate.

Summary Tables

The sheets entitled *Major Group Summary*, *Subgroup Summary*, *Combined Common Group Summary* and *Severity Scores Summary* summarize the data entered in the *Multiple DX Look-up* sheet by any of the grouping methods described above. Three columns are displayed in each default summary table. The first column is the description of the grouping method used in each table respectively, the second column is the Count of Diagnoses, and third column is the Percent of Total Diagnoses. However, displays in the Summary Tables may be modified to include any available grouping method (see below). Note that the summary tables' results reflect the number of rows in the Multiple DX Look-up sheet. Thus, the unit of analysis is often the diagnosis. If only one diagnosis is selected per visit and entered into an individual row, the unit of analysis is the visit.

The summary tables can be altered using a few table options, found in the PivotTable toolbar. If you cannot see the PivotTable toolbar, go to View – Toolbars – PivotTable to add this. Use the mouse pointer to hover over each icon and view its purpose. You may also refer to an Excel tutorial for other uses of PivotTables

<http://www.edferrero.com/ExcelTutorials/PivotTableTutorial2003/tabid/89/Default.aspx>

Refresh Data – After making changes to the data in the *Multiple DX Look-up* sheet, the summary table will need to be refreshed. Do this by selecting *refresh data* from the PivotTable toolbar.

Format Report – The *format report* feature changes the visual appearance of the table to the format selected.

Chart Wizard – Clicking the *chart wizard* option will produce a bar chart of the summary results in a new sheet.

Show/Hide Detail – The *show detail* option has different outcomes depending on which cell on the sheet is selected at the time the option is chosen.

If a single cell in the count or percent column is highlighted when *show detail* is executed, those rows from the *Multiple DX Look-up* sheet which fall into that corresponding major group description category are displayed in a new sheet.

If one or more cells are selected in the *Major Group Description* column when *show detail* is executed, subgroups are shown for those groups selected. Alternatively, if the column heading itself is selected, details will be shown for all rows in that column. The *hide detail* option works the same way. Details for individual categories will be hidden if that single cell is selected; and if the column heading is selected, details for all rows will be hidden.

Field Settings – The *field settings* tool summarizes the information in a column and allows for changes to be made to the type of data displayed (count, percent, etc.).

Show Field List – *Show field list* opens a window of additional variables that can be added to the report.

Hide – An entire column can be hidden from the table by selecting the column name, right clicking the mouse, and choosing *Hide*.

Additionally, there is a drop-down menu associated with the *Major Group Description* column heading. From this menu, individual descriptions (rows) can be included in or removed from the table.

Note: In the special case that you need to obtain the DGS categorizations for more than 65,000 diagnoses, you will have to partition your data and create several separate output sheets then combine these in another program for a final dataset. This will require an interim format for your data, such as a text file.

Appendix: The Diagnosis Grouping System for Child ED Visits

- 1. Allergic, Immunologic & Rheumatologic Diseases**
- 2. Child Abuse**
- 3. Circulatory & Cardiovascular Diseases**
 - a. Congenital Circulatory & Cardiovascular Diseases
 - b. Devices & Complications of the Circulatory System
 - c. Dysrhythmias
 - d. Other Circulatory & Cardiovascular Diseases
- 4. Diseases of the Eye**
 - a. Infectious Diseases of the Eye
 - b. Non-Infectious Diseases of the Eye
- 5. Endocrine, Metabolic & Nutritional Diseases**
 - a. Diabetes Mellitus
 - b. Other Endocrine, Metabolic & Nutritional Diseases
- 6. ENT, Dental & Mouth Diseases**
 - a. Infectious Ear Disorders
 - b. Infectious Dental Disorders
 - c. Infectious Mouth & Throat Disorders
 - d. Infectious Nose & Sinus Disorders, including URI
 - e. Non-Infectious ENT, Dental & Mouth Diseases
- 7. Fluid & Electrolyte Disorders**
 - a. Dehydration
 - b. Other Fluid & Electrolyte Disorders
- 8. Gastrointestinal Diseases**
 - a. Abdominal Pain
 - b. Appendicitis
 - c. Devices & Complications of the Gastrointestinal System
 - d. Gastroenteritis
 - e. Infectious Gastrointestinal Diseases
 - f. Vomiting
 - g. Other Gastrointestinal Diseases

9. Genital & Reproductive Diseases

- a. Infectious Genital & Reproductive Diseases
- b. Pregnancy
- c. Other Genital & Reproductive Diseases

10. Hematologic Diseases

- a. Sickle Cell Anemia
- b. Other Hematologic Diseases

11. Musculoskeletal & Connective Tissue Diseases

- a. Chest Pain
- b. Devices & Complications of the Musculoskeletal System
- c. Infectious Musculoskeletal & Connective Tissue Diseases
- d. Musculoskeletal Pain
- e. Non-Infectious Musculoskeletal & Connective Tissue Diseases

12. Neoplastic Diseases (Cancer, Not Benign Neoplasms)

13. Neurologic Diseases

- a. Developmental Disorders
- b. Devices & Complications of the Nervous System
- c. Headache
- d. Infectious Neurologic Diseases
- e. Seizures
- f. Other Neurologic Diseases

14. Psychiatric and Behavioral Diseases & Substance Abuse

15. Respiratory Diseases

- a. Asthma
- b. Bronchospasm & Wheezing
- c. Devices & Complications of the Respiratory System
- d. Infectious Respiratory Diseases
- e. Other Respiratory Diseases

16. Skin, Dermatologic, & Soft Tissue Diseases

- a. Infectious Skin, Dermatologic & Soft Tissue Diseases
- b. Non-Infectious Skin, Dermatologic & Soft Tissue Diseases

17. Systemic States

- a. Acute Systemic States
- b. Bacterial & Fungal Illnesses
- c. Chronic Systemic States
- d. Fever
- e. Viral Illnesses

18. Toxicologic Emergencies (Including Environmental)

19. Trauma

- a. Abdominal Trauma
- b. Brain & Skull Trauma
- c. Burns (External, Of Any Body Part)
- d. Chest Trauma
- e. Complications of Trauma
- f. Contusions & Abrasions (External, Of Any Body Part)
- g. Face, Dental, Mouth & Eye Trauma
- h. Fractures & Dislocations (Extremities)
- i. Lacerations, Amputations & Uninfected Foreign Bodies (External)
- j. Pelvis & External Genitalia Trauma
- k. Spinal Trauma (Incl. Spinal cord and vertebrae trauma)
- l. Strains & Sprains (Extremities)
- m. Other Extremity Trauma
- n. Other Trauma

20. Urinary Tract Diseases

- a. Devices & Complications of the Urinary System
- b. Infectious Urinary Tract Diseases
- c. Other Non-Infectious Urinary Tract Diseases

21. Other

- a. Screening Exams, Labs & Administrative Issues
- b. Other Devices & Complications
- c. Other Infectious Diseases
- d. Other Neonatal Disorders
- e. Other Non-Infectious Diseases