



Change from AR-DRG V6.0 to V8.0

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25th May 2016

Agenda

- ▶ Introduction to Diagnosis Related Groups (DRGs)
 - AR-DRG Classification System
 - AR-DRG Grouping process
- ▶ DRG Complexity
 - Revision of the case complexity model
- ▶ Changes from AR-DRG V6.0 to V8.0
 - Additions, removals
 - Changes to the underlying grouper logic

Introduction

What are DRGs?

- ▶ Diagnosis Related Groups (DRGs) refer to a patient classification system that provides a clinically meaningful way of relating the types of patients treated in a hospital to the resources required by the hospital to treat them
- ▶ The DRG system enables the disaggregation of patients into homogeneous groups, which undergo similar treatment processes and incur similar levels of resource use
- ▶ DRGs use information in the patient's hospital record such as diagnoses, procedures, and other information such as age and length of stay to classify the patient

What are DRGs?

- ▶ DRGs enable the measurement of hospital output taking into account the different mix of cases treated in hospitals
- ▶ This allows for a meaningful comparison of hospital efficiency to be made and can provide a basis for service planning, budgeting and financing
- ▶ Since 2004 Ireland has been using the Australian Refined DRG system
- ▶ Up until 2013 it was used to measure efficiency and to determine Casemix budget adjustments
- ▶ In 2016 it forms the basis of Activity Based Funding

The AR-DRG Classification System

The AR-DRG Classification System

- ▶ Australian developed system
- ▶ Designed based on ICD-10-AM/ACHI clinical coding
- ▶ First released in 1998
- ▶ Generally updated every 2 years
- ▶ Ireland doesn't adopt all versions
- ▶ Last change in Ireland was from v5.1 to v6.0 in 2009
- ▶ Current change is from v6.0 to v8.0

AR-DRG Hierarchy

The AR-DRG classification has a hierarchical structure:

- ▶ Major diagnostic category (MDC)
- ▶ Surgical/medical/other partitions
- ▶ Adjacent diagnosis related groups (ADRGs)
- ▶ Diagnosis related groups (DRGs)

DRG Structure

- ▶ DRGs are identified by a 4 character code

Indicates the **MDC** to which the DRG belongs



B 7 0 A



Indicates the **complexity** level of a DRG

A – highest
B – second highest
C – third highest
D – fourth highest
Z – no split

Indicates the **partition** to which the DRG belongs:

01-39 – surgical
40-59 – other
60-99 medical

Example:

DRG **B70A** *Stroke and other cerebrovascular disorders, Major Complexity*

B: MDC – diseases and disorders of the nervous system,

70: medical,

A: split ranking it as highest complexity level within the ADRG group.

How is a DRG assigned?

- ▶ A DRG is assigned for each episode of care using DRG grouper software
- ▶ There are 7 steps in the DRG grouping process

The AR-DRG Grouping Process

1. Demographic and Clinical Edits

- Edits check the validity of the data
- Demographic edits check age, sex, LOS, etc.
- Clinical edits validate all ICD-10-AM/ACHI diagnosis and procedure codes
- Cases with major errors are assigned to error DRGs

2. Major Diagnostic category (MDC) Assignment

- MDCs are roughly aligned along body system
- Assignment generally based on principal diagnosis
- Exceptions can occur

The AR-DRG Grouping Process

3. Pre-MDC Processing

- Identifies and assigns the very high cost DRGs which comprise the pre-MDC category
- Changes MDC assignment in cases where MDC is not defined exclusively based on PDx

4. MDC Partitioning

- Assignment of cases to Surgical, Medical or Other partitions
- Mainly based on the presence or absence of OR and non-OR procedures

The AR-DRG Grouping Process

5. Adjacent DRG (ADRG) Assignment

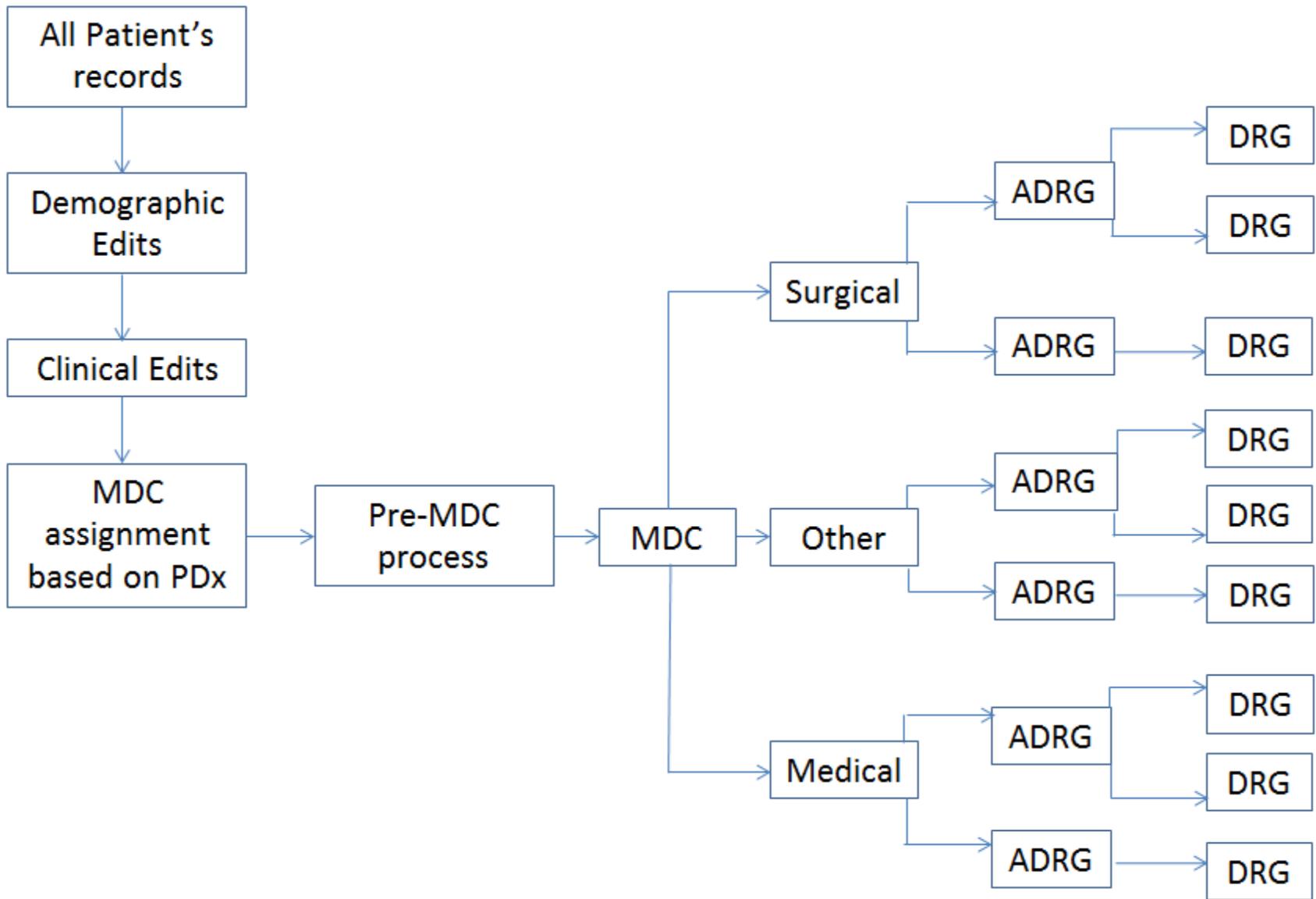
- Assignment mainly based on diagnosis and procedure codes

6. DCL and ECCS assignment

- Every diagnosis in each ADRG is assigned a DCL (0 to 5)
- These are combined into a ECCS score which measures each episode's clinical complexity

7. DRG Assignment

- Assignment of a DRG within the ADRG is based mainly on ECCS



Complexity – Revision of the case complexity model

Complexity

- ▶ The treatment of diseases and disorders can be made more difficult and expensive by the presence of multiple conditions and/or the development of complications during an episode of care
- ▶ It is therefore important for DRG classifications to recognise and measure clinical complexity
- ▶ A complexity model is used to split ADRGs into DRGs
- ▶ **Complete revision** of the complexity model in V8.0

Revision of the Case Complexity Model

- ▶ Prior to V8.0, the complexity methodology had not been revised since its introduction in 1998
- ▶ Improvements in data collection, costing and computing capacity.
- ▶ Revision work commenced by the ACCD in 2013 identified the need to redevelop the case complexity system so that it better reflected the latest costing data
- ▶ New model created for AR-DRG V8.0 - **Episode Clinical Complexity Model (ECC Model)**

Revision of the case complexity model – Terminology comparison table

AR-DRG V6.0	AR-DRG V8.0
NA	Episode Clinical Complexity (ECC) Model assigns a score to each episode. These scores quantify relative levels of resource utilisation within each ADRG and are used to split ADRGs into DRGs on the basis of resource homogeneity.
Complication and/or Comorbidity (CC) codes are the diagnosis codes that may contribute to the calculation of PCCL (i.e. the diagnoses that may affect the calculation of episodes level complexity).	Complex Diagnoses (CDs) in a particular ADRG are the set (or list) of diagnoses that may affect the calculation of episode clinical complexity in that ADRG. CDs differ across ADRGs.
Complication and Comorbidity Levels (CCLs) are integer values between 0 and 4 assigned to diagnosis codes as complexity weights, specific to the ADRG of the episode. Only CC codes receive nonzero CCLs.	Diagnosis Complexity Levels (DCLs) are integer values between 0 and 5 assigned to diagnosis codes as complexity weights, specific to the ADRG of the episode. The CDs of an ADRG are precisely those diagnoses assigned a nonzero DCL.
Patient Clinical Complexity Level (PCCL) is an integer between 0 and 4 assigned to episodes as measure of the cumulative effect of a patient's CCs.	Episode Clinical Complexity Score (ECCS) is a value between 0 and 32 assigned the measure of the cumulative effect of DCLs for a specific episode.
Mild, moderate, severe and catastrophic CCs are descriptive terms used in the naming of DRGs where PCCL has been used as a splitting variable.	Minor, Intermediate, Major and Extreme Complexity are descriptive terms used in the naming of DRGs where ECCS has been used as a splitting variable.

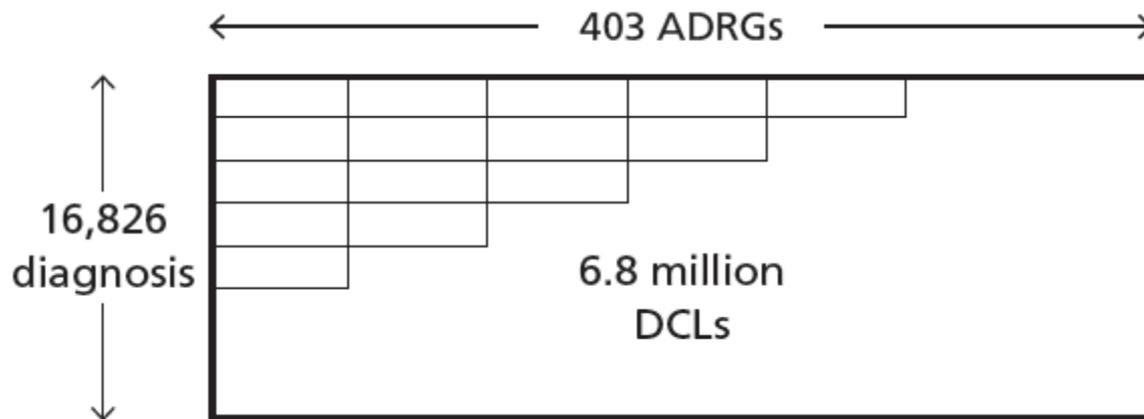
Source: <https://www.accd.net.au/Education.aspx?page=4>

Introduction to ECC Model

- ▶ The ECC Model is the component of the AR-DRG classification that recognises and allows for cost variation within ADRGs
 - Each diagnosis is assigned a complexity level known as the **Diagnosis Complexity Level (DCL)**
 - The DCLs for each episode are combined to give an **Episode Clinical Complexity Score (ECCS)**
 - ECC Model uses the ECCS to split ADRGs into DRGs

Diagnosis complexity level – DCL

- ▶ DCL values are integer values ranging from 0 to 5
- ▶ DCL assigned for each diagnosis within each ADRG
- ▶ Some diagnoses are excluded from the model, these diagnoses get a DCL of 0



Episode clinical complexity score – ECCS

- ▶ The DCLs of the episode are then combined using an algorithm to create the ECCS associated with the episode. The ECCS is a value between 0 and 32
- ▶ The algorithm combines the DCLs in descending order and includes a decay component to adjust for the correlation among diagnoses and overlapping of cost associations

$$ECCS(e) \stackrel{\text{def}}{=} \sum_{i=1}^n DCL(x_i, A) \cdot (0.84)^{i-1}$$

Splitting logic – example

B02A Cranial Procedures, Major Complexity

B02B Cranial Procedures, Intermediate Complexity

B02C Cranial Procedures, Minor Complexity

If (ECCS \geq 3.5) then B02A;
else if (ECCS \geq 2.0) then B02B;
else B02C

Terminology comparison example

AR-DRG V6.0	AR-DRG V8.0
B02A Cranial Procedures W Catastrophic CC	B02A Cranial Procedures, Major Complexity
B02B Cranial Procedures W Severe CC	B02B Cranial Procedures, Intermediate Complexity
B02C Cranial Procedures W/O Catastrophic or Severe CC	B02C Cranial Procedures, Minor Complexity

Changes from AR-DRG V6.0 to V8.0

Revision of ADRG Splitting

- ▶ Number of DRGs has increased from 698 in AR-DRG V6.0 to **807** in AR-DRG V8.0
- ▶ Number of ADRGs has increased from 399 in AR-DRG V6.0 to **406** in AR-DRG V8.0

ADRGs added	14
ADRGs removed	7
Splits added	194
Splits removed	22

	V6.0	V8.0
ADRG splitting	No. ADRGs	
No split (Z)	156	85
Two levels (A,B)	192	246
Three levels (A,B,C)	46	70
Four levels (A,B,C,D)	5	5
Total ADRGs	399	406
Total DRGs	698	807

Major Diagnostic Category	AR-DRG	
	V6.0	V8.0
01 Diseases and disorders of the nervous system	61	69
02 Diseases and disorders of the eye	19	25
03 Diseases and disorders of the ear, nose, mouth and throat	27	34
04 Diseases and disorders of the respiratory system	47	46
05 Diseases and disorders of the circulatory system	80	87
06 Diseases and disorders of the digestive system	46	45
07 Diseases and disorders of the hepatobiliary system and pancreas	28	33
08 Diseases and disorders of the musculoskeletal system and connective tissue	83	97
09 Diseases and disorders of the skin, subcutaneous tissue and breast	34	37
10 Endocrine, nutritional and metabolic diseases and disorders	28	33
11 Diseases and disorders of the kidney and urinary tract	37	40
12 Diseases and disorders of the male reproductive system	16	20
13 Diseases and disorders of the female reproductive system	18	24
14 Pregnancy, childbirth and the puerperium	14	19
15 Newborns and other neonates	25	37
16 Diseases and disorders of blood, blood forming organs, immunological disorders	9	11
17 Neoplastic disorders (haematological and solid neoplasms)	18	18
18 Infectious and parasitic diseases, systemic or unspecified sites	18	19
19 Mental diseases and disorders	11	19
20 Alcohol/drug use and alcohol/drug induced organic mental disorders	6	10
21 Injuries, poisonings and toxic effects of drugs	29	36
22 Burns	8	10
23 Factors influencing health status and other contacts with health services	13	14
Unassignable to MDC	6	6
Pre MDC	17	18
Total	698	807

Major Diagnostic Category	V6.0	V8.0	Difference
01 Diseases and disorders of the nervous system	66,884	67,027	143
02 Diseases and disorders of the eye	51,214	51,264	50
03 Diseases and disorders of the ear, nose, mouth and throat	53,233	53,251	18
04 Diseases and disorders of the respiratory system	82,441	82,438	-3
05 Diseases and disorders of the circulatory system	98,139	98,144	5
06 Diseases and disorders of the digestive system	186,955	186,840	-115
07 Diseases and disorders of the hepatobiliary system and pancreas	22,192	22,306	114
08 Diseases and disorders of the musculoskeletal system and connective tissue	110,123	110,104	-19
09 Diseases and disorders of the skin, subcutaneous tissue and breast	104,426	104,417	-9
10 Endocrine, nutritional and metabolic diseases and disorders	15,598	15,576	-22
11 Diseases and disorders of the kidney and urinary tract	211,625	211,631	6
12 Diseases and disorders of the male reproductive system	15,723	15,730	7
13 Diseases and disorders of the female reproductive system	41,469	41,472	3
14 Pregnancy, childbirth and the puerperium	121,347	121,347	0
15 Newborns and other neonates	14,372	14,372	0
16 Diseases and disorders of blood, blood forming organs, immunological disorders	44,342	44,342	0
17 Neoplastic disorders (haematological and solid neoplasms)	201,428	201,427	-1
18 Infectious and parasitic diseases, systemic or unspecified sites	10,930	10,914	-16
19 Mental diseases and disorders	3,565	2,683	-882
20 Alcohol/drug use and alcohol/drug induced organic mental disorders	2,050	2,050	0
21 Injuries, poisonings and toxic effects of drugs	15,478	15,540	62
22 Burns	563	568	5
23 Factors influencing health status and other contacts with health services	66,791	67,673	882
00 Unassignable to MDC	1,915	1,757	-158
Pre MDC	2,886	2,816	-70
Total	1,545,689	1,545,689	0

File Source: 2015_ASOF_1215_V13_PROVISIONAL

14 ADRGs added

I40	Infusions for Musculoskeletal Disorders, Sameday
I80	Femoral Fractures, Transferred to Acute Facility <2 Days
I81	Musculoskeletal Injuries, Sameday
I82	Other Sameday Treatment for Musculoskeletal Disorders
K10	Revisional and Open Bariatric Procedures
K11	Major Laparoscopic Bariatric Procedures
K12	Other Bariatric Procedures
K13	Plastic OR Procedures for Endocrine, Nutritional and Metabolic Disorders
P07	Neonate, AdmWt <750g W Significant OR Procedure
P08	Neonate, AdmWt 750-999g W Significant OR Procedure
P68	Neonate, AdmWt >=2500g W/O Sig OR Proc/Vent>=96hrs, >=37 Completed Wks Gestation
V65	Treatment for Alcohol Disorders, Sameday
V66	Treatment for Drug Disorders, Sameday
Z66	Sleep Disorders

ADRG Added – Example 1

- ▶ *Z66 Sleep disorders* was added in V8.0
- ▶ The cases in this ADRG were grouped to two ADRGs in V6.0
 - *U65 Anxiety disorders (94.5%)*
 - *U60 Mental health treatment, sameday, W/O ECT (5.5%)*
- ▶ This accounts for the majority of the episodes that moved from *MDC 19 Mental diseases and disorders* to *MDC 23 Factors influencing health status and other contacts with health services*

ADRG Added – Example 2

- ▶ *I40 Infusions for musculoskeletal disorders, Sameday* was added in V8.0
- ▶ The cases in this ADRG would have been grouped to a number of different ADRGs in V6.0 of the classification, the top five are as follows:
 - *I68 Non-surgical spinal disorders* (27.4%)
 - *I71 Other musculotendinous disorders* (23.1%)
 - *I66 Inflammatory Musculoskeletal Disorders* (20%)
 - *I69 Bone diseases and athropathies* (16.9%)
 - *I72 Specific musculotendinous disorders* (9.9%)

7 ADRGs removed

G62	Complicated Peptic Ulcer
G63	Uncomplicated Peptic Ulcer
K04	Major Procedures for Obesity
K07	Obesity Procedures
O64	False Labour
R64	Radiotherapy
S60	HIV, Sameday

ADRG removed – Example 1

- ▶ R64 *Radiotherapy* was present in V6.0 but has been removed in V8.0
- ▶ The cases that were previously grouped into this ADRG in V6.0 are being grouped into R62 *Other neoplastic disorders* in V8.0
- ▶ R64 had no complexity split (DRG R64Z)
- ▶ R62 has three complexity levels
 - R62A *Other neoplastic disorders, major complexity*
 - R62B *Other neoplastic disorders, intermediate complexity*
 - R62C *Other neoplastic disorders, minor complexity*

		DRG V8.0						
		R62A		R62B		R62C		Total
		Count	Row N %	Count	Row N %	Count	Row N %	Count
DRG V6.0	R64Z	438	.6%	2,649	3.7%	68,728	95.7%	71,815

ADRG removed – Example 2

- ▶ K04 *Major procedures for obesity* has been removed in V8.0
- ▶ Episodes that were grouped to K04 in V6.0 are being grouped to the following ADRGs in V8.0:
 - K11 *Major laparoscopic bariatric procedures* (60%)
 - K10 *Revisional and open bariatric procedures* (40%)

		AR-DRG V8.0				
		K10		K11		Total
		Count	Row N %	Count	Row N %	Count
AR-DRG V6.0	K04	22	40.0%	33	60.0%	55

- ▶ K07 *Obesity procedures* has been removed in V8.0
- ▶ The majority of the episodes that were grouped to K07 in V6.0 are being grouped to K13 *Plastic OR procedures for endocrine, nutritional and metabolic disorders* in V8.0

Changes in complexity split

- ▶ All AR-DRG splits have been revised using the ECC Model
- ▶ As a result, an ADRG may be the same in both versions but may have different DRG splits

Changes in complexity split – example

- ▶ *O60 Vaginal delivery* is present in both V6.0 and V8.0, with a different number of splits in each

V6.0	
O60Z	Vaginal delivery

V8.0	
O60A	Vaginal Delivery, Major Complexity
O60B	Vaginal Delivery, Intermediate Complexity
O60C	Vaginal Delivery, Minor Complexity

Effect of ECCS on splits – example

- ▶ *B70 Stroke and Other Cerebrovascular Disorders* is present in both V6.0 and V8.0, with the same number of splits in each
- ▶ However, the number of episodes within the splits has changed

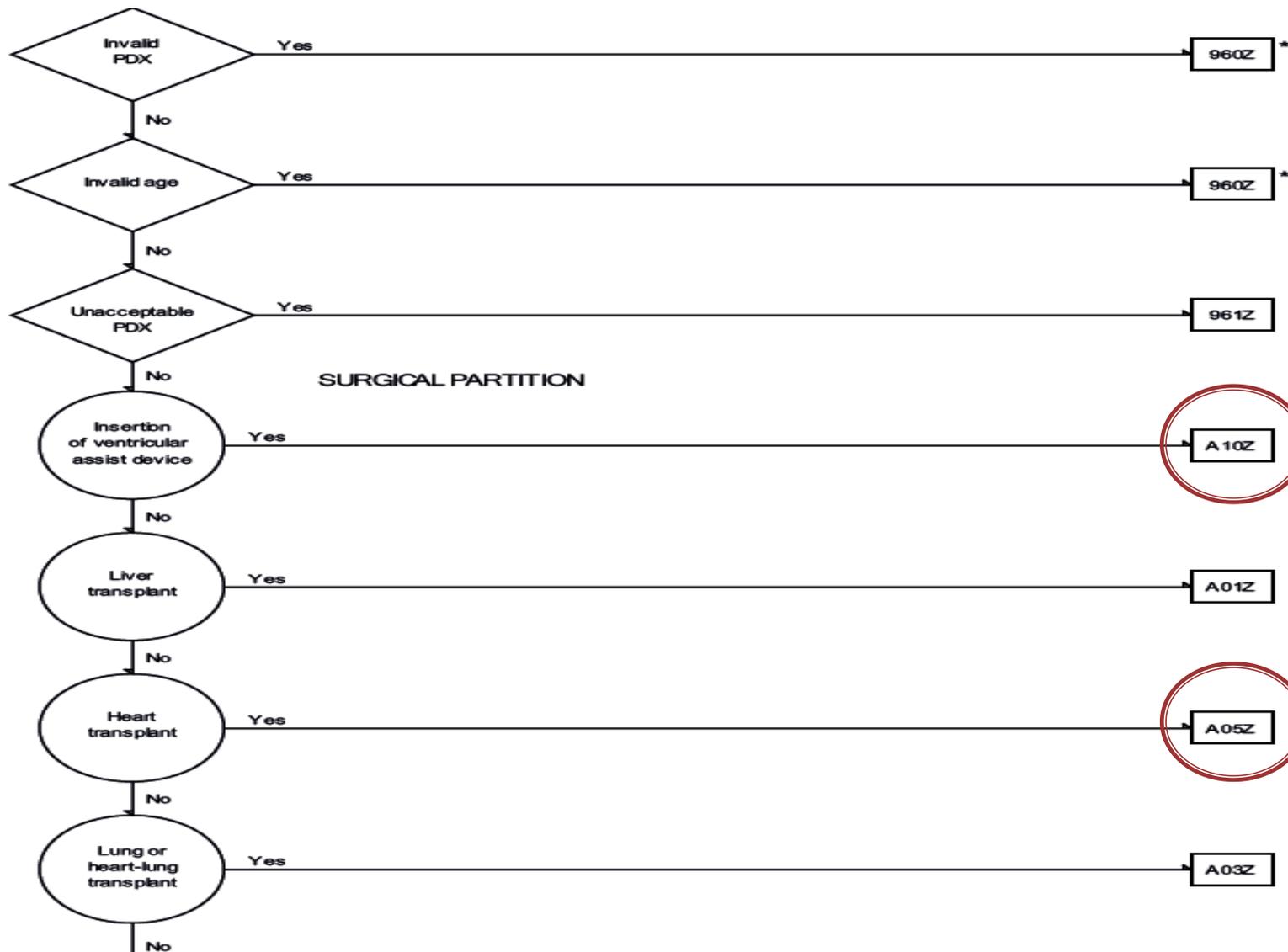
		AR-DRG V8.0								
		B70A		B70B		B70C		B70D		Total
		Count	Row N %	Count	Row N %	Count	Row N %	Count	Row N %	Count
AR-DRG V6.0	B70A	588	52.0%	504	44.6%	39	3.4%	0	0.0%	1,131
	B70B	169	11.0%	954	62.3%	408	26.6%	0	0.0%	1,531
	B70C	41	1.6%	655	26.0%	1,826	72.4%	0	0.0%	2,522
	B70D	11	2.0%	101	18.1%	165	29.5%	282	50.4%	559

MDC Logic Flowcharts

- ▶ The grouping of cases to ADRGs is controlled by logic flowcharts
- ▶ There is a separate flowchart for each MDC (including pre MDC)
- ▶ Branches in the flow charts are ordered from highest to lowest resource usage
- ▶ There has been some changes in the logic in some of these flowcharts

Pre MDC Logic change – A05 Example

- ▶ Even when there is no change to a DRG, its contents can be affected by other DRG changes or changes to the grouping logic.
- ▶ For example, not all cases of *A05 Heart Transplant* in V6.0 are in the same ADRG in V8.0, some cases may go to *A10 Insertion of ventricular assist device*.
- ▶ This happens because the selection for insertion of VAD now comes before the selection for heart transplant in the grouping logic.



Impact on ABF

- ▶ The full impact of the change in classification will not be fully known until new prices have been set and a full budget model has been constructed.
- ▶ However, the increased number of splits will likely result in a widening of the gap between higher and lower complexity hospitals.
 - Better handling of complicating diagnoses
 - DRG compression should be reduced
- ▶ It will be a challenge this year to understand the effects of the classification change on overall hospital positions.

Summary

- ▶ The highlight of V8.0 is a complete revision of the case complexity methodology within the DRG classification.
- ▶ V8.0 incorporates the ECC Model within the classification.
- ▶ There are more complexity splits resulting in greater granularity.

Thank you