

Summary of Changes

HRG4+ 2017/18 Reference Costs Grouper
From:
HRG4+ 2016/17 Reference Costs Grouper

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HRG4+ Summary of Changes - Purpose

The purpose of this summary is to provide an overview of the main changes between the HRG4+ 2016/17 Reference Costs Grouper and the HRG4+ 2017/18 Reference Costs Grouper.

Changes are broken down by:

- **Grouper Input Changes**
- **Grouper Output Changes**
- **Grouper Software Changes**
- **HRG Design Changes**

This document is intended as a high-level summary to be used to form the basis of further analysis and investigation, rather than a comprehensive list of all differences between grouper releases. Further HRG4+ supporting documentation is available from the National Casemix Office website <https://digital.nhs.uk/National-Casemix-Office>.

Changes from the HRG4+ 2016/17 Reference Costs Grouper

Grouper Input Changes

There has been an update to the type of input files that can be processed through the Grouper. In HRG4+ 2016/17 Reference Costs Grouper, a file saved as ANSI would be the only file type that would successfully process through the Grouper. In the HRG4+ 2017/18 Reference Costs Grouper, a file saved ANSI, Unicode, Unicode big endian or UFT-8 will process through the Grouper, if the data within the file contains only ASCII characters. If a user tries to process a file which contains non-ASCII characters, then grouping will fail with the message 'Non-ASCII Characters detected'.

The Data Dictionary states the maximum number of episodes in a spell should be 87 however episode numbers 98 and 99 are used to denote “Not Applicable” and “Not Known” respectively. There has been a change to how the Grouper handles Epiorders of 98 and 99. In RC1617 episodes with Epiorder 98 and 99 would produce a valid HRG, this has been changed so that when Epiorder 98 and 99 are used this will fail validation and a UZ01Z HRG will be generated.

Grouper Output Changes

Specialised Service Codes (SSCs) are no longer output by the Grouper. The output fields however, have been retained for this release but will no longer be populated.

Grouper Software Changes

Since the publication of the last HRG4+ 2016/17 Reference Costs Grouper, the National Casemix Office (NCO) have been making further enhancements to the Grouper software. The main developments of the HRG4+ 2017/18 Reference Costs Grouper have been to the user interface to make the product easier to use and help users understand how the product can be used in a variety of ways and not simply for batch processing of patient data.

Installation

There have been a number of updates made to the installation wrapper that accompanies the Grouper.

Installation of the Grouper requires Microsoft Windows .NET Framework version 4.5 or above. If .NET 4.5 or newer is not installed, the installer will prompt to download and install it at this stage. If it cannot be downloaded or installed successfully, then the Grouper installation will not proceed. Extra error messages have been introduced to help resolve any issues with the installation process, and we have added a trouble-shooting guide in Appendix A within this document to further assist users who are experiencing problems.

The Sample RDF folder that is installed as part of the installation files has been renamed to Default RDF and the RDF files themselves have been renamed from sample to default i.e. HRG4+_sample_APC.rdf to HRG4+_default_APC.rdf.

The Sample Data file, HRG4+ Admitted Patient Care Sample Test Data.csv, that is installed as part of the installation process has been updated. The file installed in the previous Reference Costs Grouper contained trailing spaces. The updated file has all trailing spaces removed from the diagnosis codes.

Home Page Screen

The Home Page screen has remained largely unchanged from the published HRG4+ 2016/17 Reference Costs Grouper. The only change worth noting is the word (*New..*) next to the Grouper function names have been replaced by hyperlinks.

Batch Processing Screen

There have been a number of updates made to the batch screen to enhance the usability, most notably the introduction of 'drag-and-drop' functionality.

The background colour of the Input File and Output File boxes have changed from grey to white and users are now able to drag and drop an RDF or an input file directly into the relevant locations on the Batch Screen. In addition to this, the output file box is now editable allowing users to manually enter the location of where they would like output files to be generated.

The input and output file boxes now display the full file path locations. This means if a user wishes to generate output files to the same location as the input file, then a user can simply copy the file path location displayed in the input file box and paste into the output box. As the output file box is editable, simply amend the name of the file at the end of the location path to what you want to call your output files.

On the Batch Preview window, where the 'Input data headings' is ticked, RDF headers are now shown as bold and input file headers are surrounded by rounded brackets to help users identify which are RDF headers and which are input file headers.

Where a user tries to process a file, with the file type ANSI but contains non-ASCII characters, then it will fail grouping and state 'Non-ASCII file detected'. If the same file is processed now, then it will still fail grouping but states 'Non-ASCII characters detected'. This provides more clarity to the user that it is an issue with the data in the file and not the file type it is saved as.

A number of icons have been added to the navigation area for Batch, to show users the progress of their batch runs. This is useful when processing a large file and a user navigates away from the Batch Screen, the icons can be used as a guide to say whether the processing has completed, is still running or an issue has been encountered. The icons that are shown are as follows:

When the Batch run is currently processing it shows an egg timer:



When the Batch run has completed processing it shows a tick:



When the Batch run has errored it shows a warning sign:



Record Definition File (RDF): Creation and Editing

The RDF Editor screen has had a number of updates to the screen layout and updates to current functionality to help users create or modify RDFs.

There has been a name change to the file selection function, so it is now called 'Input File' rather than 'Create from file' to align with the naming convention on the Batch screen.

The background colour of the Input File box has changed from grey to white and users are now able to drag and drop an existing RDF or an input file directly into the relevant locations on the RDF Editor Screen, displaying the files full path location.

In the previous Grouper, there was a section called 'Number of fields' where a user could amend the number of variable fields for particular databases. This functionality still exists in the Grouper but has been incorporated into the new 'Field Customisation' button on the RDF Editor screen.

Undo and Redo buttons have been introduced allowing users to undo a previous action or redo the previous action (up to maximum of 5 changes). In addition to the Undo and Redo buttons a user can use the shortcut combination keys of CTRL+Z (Undo) and CTRL+Y (Redo).

Un-assignment of fields has now been made easier with the addition of functionality in the file preview window so that when a field is dragged into the window, an 'x' is placed next to each Field name so a user can click on the 'x' which will un-assign the field.

The yellow highlight that was present on the Position column has been moved over to the Field column to make it clear that it is the field names that need to be dragged up into the file preview window to assign it a position in the RDF.

The application of picture and extract has now been extended to include the PROCODET field and any specification will now be applied to the input file prior to the input file being sorting.

Viewer

The Viewer is now an important module within the Grouper product and as such has had a number updates to the screen layout and includes new functionality to assist users.

The background colour of the File box has changed from grey to white to indicate to users that they are now able to drag and drop a file directly (in addition to the usual navigation) displaying the files full path location.

Filters have been introduced on the File View window, allowing users to filter on the information displayed. On the top row of the File Viewer window, each column contains a small drop-down arrow, which when click, a pop-up box appears allowing users to filter on a particular value. Wildcards of * and ? are supported (multiple and single characters respectively).

A user can filter on blanks by just clicking on the 'Filter Column' without entering a value. A user can clear individual filters by clicking on the small drop-down arrow and clicking on the bin icon which resets the column. If a user has multiple filters applied and wants to removal them all, then a user can select the red 'Clear All Filter' button, which will removal all filters that are applied to the data.

The Viewer screen now includes a 'Use file header' tick box. On first install, this will be defaulted to ticked and will only become visible on screen when a file is selected. When ticked it will display the values from the first row of data from the file and displayed in rounded brackets along with RDF headers in bold (if an RDF is selected). If the file spans over multiple pages in the File View window, then headers will remain visible where this is ticked. If a user unchecks the tick box, then the first line of the file will be treated as a row of data.

A page number box has been introduced allowing users to specify which screen page of data they would like to display rather than having to use the backward and forward buttons.

Cross use of the Viewer and Single Spell

While the use of the viewer has limited values for manipulating large files (due to the display limitations) one specific area of development has been to introduce cross-functionality, whereby a user can now open a file (be it an input or an output grouper file) and they can now double click on a row of data in the File Viewer window which will then open a new Single Spell window with the information populated in the relevant fields.

This is powerful functionality for exploring particular records (or grouper outputs) to understand HRG generation and can be used to manipulate code sequencing or code additions/deletions within the single spell window. It also means that a grouper output can be displayed and any input record can be viewed in single spell very easily. In addition to the existing import into single spell and the new print / export functionality (that is described in the next section) this will enable users to share grouping information much easier and quickly than previously.

We are continuing to develop this functionality and will provide example data that illustrates how all HRG's within a design can be generated in future releases.

Single Spell Processing

The Single Spell functionality has been the most important area of development since our previous product release, changes to the screen layout and additional functionality have been introduced to help users when grouping individual records and to understand HRG generation.

Screen Layout

The Database and Record Definition File boxes have been switched around, so the logical order is for a user to select a database first which will then automatically populate the Record Definition File box with a default RDF with a defined set of input fields for users to enter data. A user can still choose an RDF first which will automatically detect the relevant Database.

Drag and drop has been introduced to the Record Definition File box allowing users to drag and drop an RDF straight into the single spell screen.

A 'Field Customisation' button has been introduced allowing users to change the number of variable fields for certain databases, so the use of a bespoke RDF is no longer required.

Undo and Redo buttons have been introduced allowing users to undo a previous action or redo the previous action (up to a maximum of 5).

The forward button, on the slider bar, has now been moved next to the backward button so users can easily move between episodes.

Exporting and Print Screen

A new function has been added to the 'Export' button which allows a user to save the information in the single spell window as a HTML file. The html file displays the information in a format, similar to the single spell window, which users are then able to print off, or 'save' and send as required.

In addition, using the right-click button, users can export data into excel in the transposed record format as displayed in the single spell.

Users are still able to use the 'Export' button to save the information from single spell as a .CSV file type, by changing the file type from .HTML and this will export the record in the flat file format that is reflective of the input data format as used by the Grouper.

Users already have the facility to be able to copy and paste directly into a single spell window, from Excel for example, and this has now been extended to allow users to Copy and Paste all information within a single spell input or output window, back out. To copy information from a window, highlight all rows using **Ctrl+A**, then either right-click and select 'Copy (With descriptions)' or use shortcut keys **Ctrl+Alt+C**. Once copied, a user can then paste the information in another application that supports copy and paste functionality.

Code Auto Complete and Re-sequencing

The single spell input window now contains an auto complete function on certain fields for each of the databases. When a user starts to enter data in one of the value cells where auto complete is applicable, then a list of 10 relevant/matching codes will be displayed along with its description. A user can then select the appropriate code or if they continue typing in the cell, the list of relevant codes will narrow down based on pattern matching.

Within the following fields listed below, users can now re-sequence using a 'Drag and Drop' facility within single spell.

APC – Diagnosis and Procedure fields

NAC – Procedure fields

EM – Investigation and Treatment fields

PCC – Critical Care Activity Code, Diagnosis and Procedure fields

NCC – Critical Care Activity Code fields

This can be of particular value when considering the coding sequence and its effect upon HRG generation.

To enable users to simply move codes about from one (same value) field to another, a cell value needs to be highlighted, and then it can be re-sequenced by simply dragging it to another value whose position will then be shifted down.

HRG Design Changes

Update of Base Design

The design base for the HRG4+ 2017/18 Reference Costs Grouper is the HRG4+ 2016/17 Reference Costs design.

Increase in the number of HRGs

The net number of HRGs has increased by 45, from 2,834 in the HRG4+ 2016/17 Reference Costs Grouper, to 2,879 in the HRG4+ 2017/18 Reference Costs Grouper. This increase reflects updated clinical practice, national coding guidance and National Institute for Health and Care Excellence (NICE) guidance. These changes are intended to support service redesign, to improve identification of the resource implications of specialised and complex care, and to enable better local decision-making to facilitate improved patient outcomes.

Cross-Chapter Design Changes

Incorporation of OPCS-4.8 Updates

Changes to the procedure codes as a result of OPCS-4.8 have been incorporated within the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRGs to map to, and confirm whether new codes should be a member of specific lists e.g. escalation lists.

Procedure hierarchy value review

Each OPCS-4 procedure code is assigned a hierarchical value associated with its expected resource. These hierarchical rankings are intended to reflect the expected relative costs of individual procedures, and these values, known as Procedure Hierarchy (PH) values, are used to determine the dominant procedure within a Finished Consultant Episode (FCE) or spell.

A global review and associated update of PH values has been undertaken to ensure that PH values reflect changes in clinical practice and are consistent across all subchapters. The PH value review undertaken for the 2017/18 Reference Costs design has resulted in changes to PH values across all subchapters, which is expected to result in a shift in activity within and between subchapters.

Diagnosis hierarchy value review

Each Admitted Patient Care (APC) FCE will have a primary diagnosis (ICD-10) recorded, reflecting the primary reason for care, and as determined by the clinical record for the patient. Each ICD-10 diagnosis code that is valid in the primary position of the patient record is assigned a hierarchical value, known as the Diagnosis Hierarchy (DH) value, associated with its expected resource consequences.

Where a patient has more than one primary diagnosis in a spell, because that patient spell contains more than a single FCE, and the primary diagnoses of the FCEs within that spell differ, and where no significant procedure has been recorded in the patient record, the primary diagnosis with the first highest diagnosis hierarchy (DH) value in the patient record will be used to drive grouping.

A global review and associated update of DH values has been undertaken to ensure that DH values are consistent across all subchapters. This has resulted in changes to DH values across the HRG4+ design; however, as Reference Costs are collected at the FCE level rather than the spell level, this global change is not expected to result in a shift in FCE activity within or between subchapters.

Clinical Classification Review

There is a continued requirement to ensure that the HRG design is supported by and supportive of coding guidance. For the 2017/18 Reference Costs design, a review of coding guidance and rules has been undertaken, with particular focus on OPCS-4 procedure coding and in particular the mapping of .8 Other specified and .9 Unspecified codes and the coding rules around paired code sequencing.

OPCS- 4 Other specified (-.8) global review

Within each OPCS-4 code category, there is a **.8 Other specified** procedure code. As these are valid codes, it is appropriate that they map to valid HRGs. However, due to the non-specific nature of these codes, the same **.8 Other specified** code can be used to record different procedures. These diverse procedures may consume very different levels or resource, which presents a challenge for mapping **.8 Other specified** codes to HRGs.

A cross-chapter review of **OPCS-4 .8 Other specified** codes has been undertaken. This includes the remapping of some of the **.8 Other specified** codes and the creation of combination codes to identify specific procedures using a **.8 Other specified** code plus specific subsidiary approach or site codes, to enable improved mapping to appropriate expected resource HRGs.

OPCS-4 Unspecified (-.9) global review

Within each OPCS-4 code category, there is a **.9 Unspecified** procedure code. As these are valid codes, it is appropriate, in the majority of cases, that they map to valid HRGs. However, due to the unspecific nature of these codes, these codes should only be used by the coder as a last resort, and in most circumstances, it is appropriate to use one of the more specific codes within the 3-digit OPCS code category.

A cross-chapter review **of OPCS-4 .9 Unspecified** codes has been undertaken. This includes ensuring that poorly coded **.9 Unspecified** activity does not group to a higher expected resource HRG than appropriately coded activity within the same 3-digit OPCS code category.

OPCS-4 Paired code review

Within the OPCS-4 classification there are certain codes that are considered to be “Paired codes”. These paired codes are exceptions to the coding sequencing rules, in that the approach and site codes should be sequenced after the paired codes rather than after each individual OPCS-4 code.

A cross-chapter review of OPCS-4 paired codes has been undertaken. This includes the creation of new combination codes for these paired codes, to ensure that when these paired codes are recorded and sequenced correctly as per national coding rules, the subsidiary logic is applied to the coding combination and the appropriate HRG is generated.

Updated Logic and Lists

Update to Multiple Procedure Lists

As a result of the redesign of several subchapters, lists used in multiple procedure logic have been reviewed.

Updated Interventions List

The Interventions list has been updated to reflect all procedure codes that now have maximum length of stay logic, and to remove procedures where length of stay logic no longer applies.

Amendments to accommodate NICE guidance

National Institute for Health and Clinical Excellence (NICE) guidance is reviewed annually to assess whether it is appropriate to amend the HRG design to accommodate new technology and innovation. Where appropriate the design has been amended to accommodate coding guidance as per national coding rules and issued by NICE.

Deletion and Creation of New Subchapters

Creation of Subchapter YC Neck Imaging Interventions

A new subchapter, **YC Neck Imaging Interventions**, specific to neck imaging interventions has been created by creating new combination codes and remapping codes from Subchapters **CA Ear, Nose, Mouth, Throat and Neck Procedures** and **KA Endocrine System Disorders**. This enables the identification of these imaging intervention procedures within Chapter **Y Vascular Procedures and Disorders and Imaging Interventions**, alongside the other imaging interventions subchapters.

Full details of subchapter specific changes can be found in the Chapter Summaries document that accompanies the HRG4+ 2017/18 Reference Costs Grouper release.

General Enhancements

HRG labels and descriptions have been amended.

Table : HRG Distribution by Subchapter

HRG4+ 2017/18 Reference Costs design vs. the HRG4+ 2016/17 Reference Costs design

For further details of all subchapter changes, please see the supporting documentation, including the Code to Group Excel file and the Chapter Summary document available on the National Casemix Office website at <http://content.digital.nhs.uk/casemix/costing>.

Changes made to HRGs, can have an impact on where activity groups in specific HRG designs. This is especially, though not solely true, where changes have been made to procedure hierarchy values.

Subchapter	RC17/18	RC16/17	Comment
AA Nervous System Procedures and Disorders	101	101	No change to HRG numbers or labels; addition of logic to ensure escalation of complex mid-brain tumour surgery and subdural haematoma via craniotomy surgery to higher expected resource HRGs; code remapping as a result of the .8 other specified and .9 unspecified coding reviews; inclusion of new OPCS-4.8 codes; impact of expansion of pain diagnosis and Pain Management TFC logic (see below); amendment to neurostimulator procedure mapping and logic to ensure mapping to appropriate HRGs depending on condition treated
AB Pain Management	14	13	New HRG AB24Z Alteration of Function of Nerve for Pain Management has been created specific to application of capsaicin patch(es); expansion of pain diagnosis list and logic including adult and child Pain Management TFC checks, ensuring all relevant pain management procedures map to HRGs in this subchapter for both APC and outpatients; code remapping as a result of the .8 other specified review; inclusion of new OPCS-4.8 codes; amendment to neurostimulator procedure mapping and logic to ensure mapping to appropriate HRGs depending on condition treated
BZ Eyes and Periorbita Procedures and Disorders	94	94	No change to HRG numbers or labels; code remapping to more appropriate expected resource HRGs resulting from review of eye injection and implant procedures; code remapping and amendment of logic resulting from review of ophthalmic tests to ensure the expected resources associated with these tests are appropriately reflected in the HRGs; code remapping as a result of the .8 other specified and .9 unspecified coding reviews; inclusion of new OPCS-4.8 codes; creation and mapping of new combination codes as a result of the paired code review; other procedure code remapping and amendment to logic as an outcome of a wider review of the subchapter, including review of NICE guidance, to ensure appropriate reflection of expected resource usage

Subchapter	RC17/18	RC16/17	Comment
CA Ear, Nose, Mouth, Throat and Neck Procedures	122	120	Deletion of CA01Z Complex Neck Procedures to be replaced with three CC-split HRGs; CA01C Complex Neck Procedures, with CC Score 7+ , CA01B Complex Neck Procedures, with CC Score 3-6 and CA01A Complex Neck Procedures, with CC Score 0-2 to appropriately differentiate expected resource use due to CCs, a net increase of two HRGs; Deletion of two existing tonsillectomy HRGs to be replaced with CA60C Tonsillectomy, 4 years and over and CA60D Tonsillectomy, 3 years and under , to better reflect the expected resource difference owing to the age of patient, resulting in no net increase in the number of HRGs; code remapping and addition of escalation logic on examination under anaesthetic procedures to differentiate expected resource usage between local and general anaesthetic; impact of creation of new combination codes, remapping, and addition of logic to map neck imaging intervention activity to new subchapter YC (see below); code remapping and amendment of logic resulting from a review of audiology to appropriately reflect the expected resource usage of these tests; impact of replacing combination code to remap activity to new HRG, YQ43Z Biopsy of Temporal Artery from CA05* Minor Neck Procedures ; code remapping as a result of the .8 other specified and .9 unspecified coding reviews; inclusion of new OPCS-4.8 codes; other procedure code remapping and amendment to logic as an outcome of a wider review of the subchapter, including review of NICE guidance, to ensure appropriate reflection of expected resource usage
CB Ear, Nose, Mouth, Throat and Neck Disorders	12	12	No change to HRG numbers or labels
CD Dental and Orthodontic Procedures	23	23	No change to HRG numbers or labels; code remapping as a result of the .8 other specified and .9 unspecified coding reviews; inclusion of new OPCS-4.8 codes
DZ Thoracic Procedures and Disorders	176	176	No change to HRG numbers or labels; code remapping to ensure all histoplasmosis diagnosis codes map to this subchapter from Subchapter EB ; code remapping as a result of the .9 unspecified coding review; inclusion of new OPCS-4.8 codes; creation and mapping of new combination codes as a result of the paired code review
EB Cardiac Disorders	48	48	No change to HRG numbers or labels; impact of code remapping to ensure all histoplasmosis diagnosis codes map to Subchapter DZ (see above)
EC Open and Interventional Procedures for Congenital Heart Disease	21	21	No change to HRG numbers or labels; code remapping of percutaneous procedures inherently used to treat congenital heart disease directly to this subchapter from Subchapter EY ; code remapping as a result of the .8 Other specified coding review; inclusion of new OPCS-4.8 codes; creation and mapping of new combination codes as a result of the paired code review

Subchapter	RC17/18	RC16/17	Comment
ED Open Cardiac Procedures for Acquired Conditions	50	48	Aortic repair procedure HRGs have been redesigned across both cardiac and vascular subchapter, resulting in the deletion of one HRG, ED10Z Complex Repair of Descending Thoracic Aorta and replacement with three new HRGs, ED16Z Hybrid Repair of Descending Thoracic Aorta or Aortic Arch , ED17Z Very Complex Repair of Descending Thoracic Aorta or Aortic Arch and ED18Z Complex Repair of Descending Thoracic Aorta or Aortic Arch a net increase of two HRGs; remapping of codes and addition of escalation logic to reach these new HRGs to ensure that the expected resources associated with complex aortic repair surgery (in particular aortic arch repair and hybrid surgery) are appropriately reflected in the HRG design; creation and mapping of new combination codes as a result of the paired code review
EY Interventional Cardiology for Acquired Conditions	69	65	Four new HRGs created specific to identify additional expected resource usage associated with patients that have implantation of ICD or ICD-CRT alongside major surgery e.g. CABG or valve repair or complex patients that require device extraction before renewal; impact of code remapping of percutaneous procedures inherently used to treat congenital heart disease directly to Subchapter EC ; resting ECG now ignored for grouping as no more expected resource than a standard outpatient attendance; remapping of intra-aortic balloon pump procedures to appropriately reflect expected resource usage; addition of escalation logic to reflect additional expected resource usage of patients having multiple angioplasties (with stenting) during the same admission; code remapping and addition of logic to reflect the additional expected resource usage of catheterisation of both sides of the heart; combination code creation and remapping to reflect that percutaneous heart biopsies are catheter procedures and should map to the appropriate catheter HRGs; code remapping as a result of the .8 Other specified coding review; inclusion of new OPCS-4.8 codes; creation and mapping of new combination codes as a result of the paired code review
FD Digestive System Disorders	54	54	No change to HRG numbers or labels; amendment to CC list to accommodate carcinoid syndrome; remapping of congenital atresia diagnosis codes from UZ01Z Data Invalid for Grouping to this subchapter to reflect that although extremely rare in adulthood, there is no coding guidance restricting their use for adults so therefore mapped to valid HRGs
FE Digestive System Endoscopic Procedures	41	37	Review of endoscopic procedures has resulted in the deletion of ten HRGs to be replaced with 14 new HRGs, a net increase of four HRGs (including new HRGs specific to intermediate therapeutic endoscopic procedure and remapping of codes where appropriate); deletion of redundant paediatric age split but addition of paediatric age splits that differentiate expected resource usage between pre- and school-aged children; redesign of combined upper and lower gastrointestinal tract endoscopy HRGs to differentiate expected resource usage between colonoscope and sigmoidoscope; amendment to CC list to accommodate carcinoid syndrome; code remapping as a result of the .8 Other specified and .9 unspecified coding reviews; inclusion of new OPCS-4.8 codes

Subchapter	RC17/18	RC16/17	Comment
FF Digestive System Open and Laparoscopic Procedures	113	112	New HRG FF43Z Minimal Anal Procedures has been created to accommodate the destruction of haemorrhoid procedures (now remapped from HRG root FF42 Minor Anal Procedures to better reflect expected resource use); changes have been made to logic (escalation, diagnosis-qualified, and incontinence) to acknowledge additional expected resource use linked to robotic surgery, and to better reflect the care of patients suffering from incontinence; new combination codes have been created specific to: image guided biopsy of abdominal organs, to identify the procedures Transanal minimally invasive surgery (TAMIS) and transanal endoscopic microsurgery (TEMS), for specific low-resource nerve stimulation tests, and to appropriately accommodate the subcutaneous implantation of a battery-powered ascites catheter drainage system, which have been mapped accordingly both within and outwith the subchapter; code remapping as a result of the .NICE guidance review, and 8 Other specified and .9 unspecified coding reviews; inclusion of new OPCS-4.8 codes
GA Hepatobiliary and Pancreatic System Open and Laparoscopic Procedures	27	27	No change to HRG numbers or labels; J21.2 Drainage of Gall Bladder and J33.3 Drainage of bile duct NEC have been remapped from GA03* Very Complex Open, Hepatobiliary or Pancreatic Procedures to GA05* Very Major Open, Hepatobiliary or Pancreatic Procedures to reflect that clinical treatment has progressed in recent years to reduce the expected length of stay and concomitant expected resource use; combination code J57.6+Y76.3 Endoscopic pancreatic necrosectomy has been created and mapped to GA05* Very Major Open, Hepatobiliary or Pancreatic Procedures , to appropriately differentiate expected resource usage between this endoscopic procedure and its open counterpart, as per NICE guidance; CC list amended to reflect that E34.0 Carcinoid syndrome is a major CC; code remapping as a result of the .8 Other specified and .9 unspecified coding reviews
GB Hepatobiliary and Pancreatic System Endoscopic and Percutaneous Procedures	14	14	No change to HRG numbers or labels; Combination codes J61.1+Y76.3 Endoscopic cystogastrostomy of pancreas and J61.1+Y76.4 Endoscopic ultrasound-guided cystogastrostomy of pancreas deleted with this activity now mapping to Subchapter GA Hepatobiliary and Pancreatic System Open Procedures ; CC list amended to reflect that E34.0 Carcinoid syndrome is a major CC
GC Hepatobiliary and Pancreatic System Disorders	24	24	No change to HRG numbers or labels; CC list amended to reflect that E34.0 Carcinoid syndrome is a major CC
HC Spinal Surgery and Disorders	74	74	No change to HRG numbers or labels; impact of expansion of pain diagnosis and Pain Management TFC logic (see above); remapping of OPCS-4 code V29.4 Primary anterior excision of cervical intervertebral disc and interbody fusion of joint of cervical spine to HRG root, HC63 Major Extradural Spinal Procedures , reflecting that the code represents two procedures being undertaken concurrently; code remapping as a result of the .8 Other specified and .9 unspecified coding reviews; inclusion of new OPCS-4.8 codes
HD Musculoskeletal Disorders	35	35	No change to HRG numbers or labels
HE Orthopaedic Disorders	84	84	No change to HRG numbers or labels

Subchapter	RC17/18	RC16/17	Comment
HN Orthopaedic Non-Trauma Procedures	111	111	No change to HRG numbers or labels ; changes made to site logic shifting site code Z58.4 Tibialis anterior from the knee orthopaedic site list to the foot list; new combination code W621+Y769+Z841 Primary arthrodesis and internal fixation of sacroiliac joint using minimal access approach created, according to NICE guidance, and mapped to HN14* Intermediate Hip Procedures for Non-Trauma , reflecting the expected lower cost of this minimal access procedure; code remapping as a result of the .8 Other specified and .9 unspecified coding reviews; inclusion of new OPCS-4.8 codes
HT Orthopaedic Trauma Procedures	87	87	No change to HRG numbers or labels ; changes made to site logic shifting site code Z58.4 Tibialis anterior from the knee orthopaedic site list to the foot list; code remapping as a result of the .8 Other specified and .9 unspecified coding reviews; inclusion of new OPCS-4.8 codes
JA Breast Procedures and Disorders	35	35	No change to HRG numbers or labels; code remapping as a result of the .9 unspecified coding reviews; inclusion of new OPCS-4.8 codes
JB Burns Procedures and Disorders	38	38	No change to HRG numbers or labels
JC Skin Surgery	11	12	Paediatric age splits on Minor and Intermediate skin procedure HRGs have been amended from 12 years and under / 13 years and over to more typical 18 years and under / 19 years and over splits, to more appropriately reflect the clinical treatment of paediatric patients, resulting in the deletion of and replacement with four HRGs; removal of the paediatric age split from HRG root JC47 Phototherapy or Photochemotherapy resulting in a net decrease of one HRG; code remapping as a result of the .9 unspecified coding reviews; inclusion of new OPCS-4.8 codes
JD Skin Disorders	10	10	No change to HRG numbers or labels
KA Endocrine System Disorders	18	18	No change to HRG numbers or labels; remapping of head and neck imaging intervention codes to new subchapter YC Head and Neck Imaging Interventions from KA09* Thyroid Procedures
KB Diabetic Medicine	12	12	No change to HRG numbers or labels
KC Metabolic Disorders	9	9	No change to HRG numbers or labels
LA Renal Procedures and Disorders	48	48	No change to HRG numbers or labels; amendment to CC list to accommodate carcinoid syndrome; remapping of congenital diagnosis codes, Q60.1 Renal agenesis, bilateral and Q60.6 Potter syndrome from UZ01Z Data Invalid for Grouping to this subchapter to reflect that although extremely rare in adulthood, there is no coding guidance restricting their use for adults so have been mapped to base HRG LA09* General Renal Disorders

Subchapter	RC17/18	RC16/17	Comment
LB Urological and Male Reproductive System Procedures and Disorders	148	149	HRG LB49Z High Intensity Focused Ultrasound (Male and Female) has been deleted on clinical advice and the three procedure codes that mapped to this HRG remapped within and outwith this subchapter; logic on OPCS.4 code X45.1 Donation of kidney has been amended; code remapping and combination code creation / remapping for OPCS-4 code T85.6 Block dissection of pelvic lymph nodes and combination code M498+Y021 Implantation of prosthesis into bladder ; code remapping as a result of the .8 Other specified and the .9 unspecified coding review; inclusion of new OPCS-4.8 codes; creation and mapping of new combination codes as a result of the paired code review
LD Renal Dialysis for Chronic Kidney Disease	26	26	No change to HRG numbers or labels
LE Renal Dialysis for Acute Kidney Injury	4	4	No change to HRG numbers or labels
MA Female Reproductive System Procedures	57	48	New HRG, MA48Z Medical Treatment of Ectopic Pregnancy , has been created to identify this specific treatment that includes a significant drug cost; Seven new HRGs have been created for the identification and differentiation of expected resource use associated with gynaecological “one-stop” clinics (expansion of the HRGs that previously existed); MA09Z Intermediate, Laparoscopic or Endoscopic, Upper Genital Tract Procedures has been expanded to incorporate CC splits, leading to a net increase of one HRG; multiple procedure logic has been expanded to include the escalation of minor endoscopic / laparoscopic procedures and the gynaecological fistula repair procedures; gynaecological malignancy diagnosis logic has been reviewed and enhanced to better reflect the care of patients with cancer; new combination codes Q551+Y80 Examination of female genital tract under general anaesthetic and Papanicolaou smear and Q552+Y80 Examination of female genital tract under general anaesthetic have been created and mapped to a base HRG of MA22Z Minor Lower Genital Tract Procedures to reflect the additional expected resource costs associated with GA; code remapping as a result of the .8 Other specified and the .9 unspecified coding review; inclusion of new OPCS-4.8 codes
MB Female Reproductive System Disorders	17	17	No change to HRG numbers or labels
MC Assisted Reproduction Medicine	11	11	No change to HRG numbers or labels
NZ Obstetric Medicine	55	55	No change to HRG numbers or labels; three new combination codes have been created for procedures indicative of the treatment of postpartum haemorrhage and mapped accordingly within the existing HRGs, as well as having been added to the postpartum surgical intervention list alongside L713+UTERINE Percutaneous transluminal embolisation of uterine artery

Subchapter	RC17/18	RC16/17	Comment
PB Neonatal Disorders	20	20	No change to HRG numbers or labels
PC Paediatric Ear Nose and Throat Disorders	4	4	No change to HRG numbers or labels
PD Paediatric Respiratory Disorders	24	24	No change to HRG numbers or labels; ICD-10 diagnosis codes within 3-digit category B39 Histoplasmosis have been remapped for children from HRG roots PD14 Paediatric Lower Respiratory Tract Disorders without Acute Bronchiolitis and PE23 Paediatric Cardiac Conditions to PW16* Paediatric Major Infections , to more appropriately reflect that these are a type of major infection in expected resource terms
PE Paediatric Cardiology Disorders	12	12	No change to HRG numbers or labels; ICD-10 diagnosis codes within 3-digit category B39 Histoplasmosis have been remapped for children from HRG roots PD14 Paediatric Lower Respiratory Tract Disorders without Acute Bronchiolitis and PE23 Paediatric Cardiac Conditions to PW16* Paediatric Major Infections , to more appropriately reflect that these are a type of major infection in expected resource terms
PF Paediatric Gastroenterology Disorders	17	17	No change to HRG numbers or labels
PG Paediatric Hepatobiliary Disorders	3	3	No change to HRG numbers or labels
PH Paediatric Rheumatology Disorders	4	4	No change to HRG numbers or labels
PJ Paediatric Dermatology Disorders	7	7	No change to HRG numbers or labels
PK Paediatric Diabetology, Endocrinology and Metabolic Disorders	11	11	No change to HRG numbers or labels
PL Paediatric Renal Disorders	10	10	No change to HRG numbers or labels
PM Paediatric Haematological-Oncology Disorders	14	14	No change to HRG numbers or labels
PN Paediatric Non-Malignant Haematological Disorders	9	9	No change to HRG numbers or labels

Subchapter	RC17/18	RC16/17	Comment
PP Paediatric Ophthalmic Disorders	2	2	No change to HRG numbers or labels
PQ Paediatric Immune System Disorders	2	2	No change to HRG numbers or labels
PR Paediatric Nervous System Disorders	22	22	No change to HRG numbers or labels
PT Paediatric Mental Health Disorders	4	4	No change to HRG numbers or labels
PV Paediatric Trauma Medicine	7	7	No change to HRG numbers or labels
PW Paediatric Infectious Diseases	15	15	No change to HRG numbers or labels; ICD-10 diagnosis codes within 3-digit category B39 Histoplasmosis have been remapped for children from HRG roots PD14 Paediatric Lower Respiratory Tract Disorders without Acute Bronchiolitis and PE23 Paediatric Cardiac Conditions to PW16* Paediatric Major Infections , to more appropriately reflect that these are a type of major infection in expected resource terms
PX Paediatric Medicine	46	46	No change to HRG numbers or labels
RD Diagnostic Imaging Procedures	48	47	New HRG, RD98Z Admission or Attendance for Diagnostic Imaging under General Anaesthetic has been created specifically to accommodate patients admitted for a diagnostic imaging or nuclear medicine scan under general anaesthetic; logic for the existing “empty core” (RD97Z) HRG has been amended to only be generated where length of stay is zero days; OPCS-4 code J50.1 T tube cholangiography has been remapped to an unbundled HRG root of RD30 Contrast Fluoroscopy Procedures with duration of less than 20 minutes from HRG root YG12 Other Percutaneous Diagnostic, Hepatobiliary or Pancreatic Procedures to better reflect that this is a diagnostic imaging scan; inclusion of new OPCS-4.8 codes
RN Nuclear Medicine Procedures	69	69	No change to HRG numbers or labels; logic for the existing “empty core” (RN97Z) HRG has been amended to only be generated where length of stay is zero days; inclusion of new OPCS-4.8 codes
SA Haematological Procedures and Disorders	104	104	No change to HRG numbers or labels

Subchapter	RC17/18	RC16/17	Comment
SB Chemotherapy	18	18	No change to HRG numbers or labels; logic has been amended for the existing “empty core” SB97Z Same Day Chemotherapy Admission or Attendance HRG so that it is reached where there is no unbundled chemotherapy procedure but a secondary diagnosis of Z51.1 Chemotherapy session is recorded (only to be used when a patient is solely admitted for this treatment)
SC Radiotherapy	30	30	No change to HRG numbers or labels; logic has been amended for the existing “empty core” SC97Z Same Day Radiotherapy Admission or Attendance (excluding Brachytherapy) HRG so that it is reached where there is no unbundled radiotherapy procedure but a secondary diagnosis of Z51.0 Radiotherapy session is recorded (only to be used when a patient is solely admitted for this treatment)
SD Specialist Palliative Care	10	10	No change to HRG numbers or labels
UZ Undefined Groups	1	1	No change to HRG numbers or labels; .8 Other specified and .9 Unspecified codes from extended categories have been remapped to U Error category UZ06 Poorly coded procedure for Casemix grouping purposes to comply with national coding guidance; ICD-10 Codes within chapter block P00-P04 Fetus and newborn affected by maternal factors and by complications of pregnancy, labour and delivery continue to generate UZ01Z Data Invalid for Grouping but have been remapped to U Error category UZ01 Invalid Primary Diagnosis ; inclusion of new OPCS-4.8 codes (site, plus retired code M06.4 Code retired - refer to introduction)
VA Multiple Trauma	24	24	No change to HRG numbers or labels; a logic review has removed several non-specific and/or superficial injury codes from Core4 multiple trauma logic and lists, removal of several procedures from Core4 multiple trauma logic and/or lists, rescaling of the MT_OPCS_Value and MT_ICD_Value , code values to reflect the revised procedure and diagnosis hierarchies, inclusion of paired code combinations created as a result of the OPCS-4 paired code review, inclusion of the requirement that non-body-site-specific OPCS-4 codes have a site qualifier recorded to be recognised in multiple trauma procedure scoring; inclusion of new OPCS-4.8 codes
VB Emergency Medicine	12	12	No change to HRG numbers or labels
VC Rehabilitation	23	23	No change to HRG numbers or labels
WD Treatment of Mental Health Patients by Non-Mental Health Service Providers	9	9	No change to HRG numbers or labels
WF Non-admitted Consultations	8	8	No change to HRG numbers or labels

Subchapter	RC17/18	RC16/17	Comment
WH Poisoning, Toxic Effects, Special Examinations, Screening and Other Healthcare Contacts	68	68	No change to HRG numbers or labels; five ICD-10 congenital diagnosis codes have been remapped to base HRG WH15* Special Screening, Examinations or Other Genetic Disorders , to reflect that, although extremely rare for a patient to survive to adulthood with these conditions, there are no national coding rules preventing the use of congenital diagnosis codes in adults
WJ Infectious Diseases and Immune System Disorders	38	40	HRGs WJ05A Septic Shock with CC Score 5+ and WJ05B Septic Shock with CC Score 0-4 deleted to reflect that septic shock should not be recorded as a primary diagnosis, in accordance with national coding guidance effective 1 April 2017; remaining shock diagnosis codes that previously mapped to the base HRG root WJ05 Septic Shock (A48.3 Toxic shock syndrome, R57.1 Hypovolaemic shock, R75.8 Other shock and R57.9 Shock, unspecified) have been remapped to WJ06* Sepsis
XA Neonatal Critical Care	6	6	No change to HRG numbers or labels
XB Paediatric Critical Care	9	9	No change to HRG numbers or labels
XC Adult Critical Care	7	7	No change to HRG numbers or labels
XD High Cost Drugs	58	58	No change to HRG numbers or labels
YA Neurological Imaging Interventions	11	11	No change to HRG numbers or labels; CC lists have been updated to include paediatric-specific CCs; two new combination codes have been created as part of the redesign of aortic aneurysm surgery and mapped accordingly to base HRG root YA03 Percutaneous Transluminal Embolisation of, Single Small or Medium, Intracranial or Extracranial Aneurysm ;
YC Neck Imaging Interventions	3	N/A	New subchapter for neck imaging interventions, created from new combination codes and remapped imaging intervention OPCS-4 codes from Subchapters CA Ear, Nose, Mouth, Throat and Neck Procedures and KA Endocrine System Disorders , containing three new HRGs specific to core needle biopsy, fine needle aspiration and therapeutic neck imaging interventions (see Chapter Summary for further details)
YD Thoracic Imaging Interventions	5	5	No change to HRG numbers or labels; new combination code, E59.8+Y12.3 Percutaneous irreversible electroporation of lesion of lung , created specific to this procedure to ensure all types of percutaneous ablation procedures on the lung map to YD01Z Percutaneous Ablation of Lesion of Respiratory Tract ; remapping as a result of the .8 Other specified and the .9 unspecified coding review

Subchapter	RC17/18	RC16/17	Comment
YF Gastrointestinal Imaging Interventions	9	8	Several new combination codes have been created specific to image guided biopsy of abdominal organs e.g. omentum, peritoneum, mapping to a new procedure-specific HRG, YF05Z Percutaneous Biopsy of Abdominal Cavity ; CC lists have been updated to include paediatric-specific CCs; combination codes have been deleted and new ones created for percutaneous imaging intervention procedures which have been remapped to HRG root YF04 Percutaneous Single Drainage of Abdominal Abscess
YG Hepatobiliary and Pancreatic Imaging Interventions	16	16	No change to HRG numbers or labels; CC lists have been updated to include paediatric-specific CCs; OPCS-4 code J50.1 T tube cholangiography remapped to an unbundled HRG root of RD30 Contrast Fluoroscopy Procedures with duration of less than 20 minutes , to reflect that this is a diagnostic imaging procedure; new combination codes created specific to cryoablation and irreversible electroporation of lesion of the liver and pancreas and mapped to HRG root YG01 Percutaneous Ablation of Lesion of, Liver or Pancreas
YH Musculoskeletal Imaging Interventions	11	8	Paediatric age splits added to the aspiration and biopsy HRGs within this subchapter leading to a net increase of three HRGs (three deleted, six created); new combination code, W09.4+Y12.3 Percutaneous irreversible electroporation of lesion of bone , created specific to this procedure to ensure all types of percutaneous ablation procedures on bones map to YH20Z Percutaneous Ablation of Lesion of Bone ; HRG labels have been amended for clarity
YJ Breast Imaging Interventions	9	12	Several HRGs have been redesigned to more appropriately reflect clinical care, including the deletion of five HRGs that differentiate unilateral and bilateral procedures in favour of distinguishing by three HRGs that reflect the type of image control (x-ray versus ultrasound guidance, and core versus fine needle aspiration biopsy); surgical procedure HRG YJ10Z Wire Guided Biopsy of Lesion of Breast has been deleted from this subchapter with the activity now mapping to Subchapter JA Breast Procedures and Disorders ; inclusion of new OPCS-4.8 codes; HRG labels have been amended for clarity
YL Urological Imaging Interventions	9	8	New HRG, YL30Z Percutaneous Ablation of Lesion of Prostate created to enable all types of percutaneous ablation procedures on the prostate to be separately identified; new procedure-specific combination codes created to ensure all types of percutaneous ablation procedures on the kidney map to the appropriate HRG including the relabelling of the ablation HRGs to clarify the expected complexity level; remapping as a result of the .8 Other specified coding review

Subchapter	RC17/18	RC16/17	Comment
YQ Vascular Open Procedures and Disorders	64	60	Cross-chapter review and redesign of aortic aneurysm repair has led to the deletion of five HRGs to be replaced with eight new HRGs to better differentiate between the type of aortic aneurysm being repaired (abdominal, suprarenal and thoracoabdominal aortic aneurysms); combination code L671+NECK Biopsy of artery NEC of neck has been deleted and replaced with combination code L671+O121 Biopsy of temporal artery , mapped to a new procedure-specific HRG YQ43Z Biopsy of Temporal Artery ; CC lists have been updated to include paediatric-specific CCs
YR Vascular Imaging Interventions	74	58	Cross-chapter review and redesign of aortic aneurysm repair has led to the deletion of four HRGs to be replaced with 14 new HRGs to better differentiate between the type of aortic aneurysm being repaired (thoracic, abdominal or thoracoabdominal aortic aneurysms); paediatric age splits, including those for older and younger children have been added to the vascular access HRGs within this subchapter leading to a net increase of five HRGs; new combination code L758+SCLR Sclerotherapy to arteriovenous malformation created and mapped to a new HRG specific to this procedure; YR58Z Injection Sclerotherapy of Peripheral Arteriovenous Malformation ; CC lists have been updated to include paediatric-specific CCs; inclusion of new OPCS-4.8 codes

The Documentation Suite

Below is a list of the various documents which are available to download from the National Casemix Office website <https://digital.nhs.uk/National-casemix-office/downloads-groupers-and-tools>.

This Documentation Suite provides a comprehensive resource to enable users to understand design concepts and logic, as well as practical use of the Grouper.

- The **Casemix Companion** is a starting point and general reference guide for anyone interested in learning about the casemix classification system used by the NHS in England. The document provides an introduction to HRGs, groupers, HRG4+ design concepts and grouping logic, and it contains links to additional resources
- The **Grouper User Manual** provides instructions on how to prepare and group data using the Grouper software application. Sample data with expected results is provided. This document is updated with every grouper release.
- The **Summary of Changes** document provides an overview of the main differences between the current grouper design and its relevant predecessor.
- The **Chapter Summaries** document provides an overview of the scope, composition and relevant grouping logic of individual HRG subchapters, and highlights significant changes to the latest HRG design.
- The **Code to Group Workbook** is a spreadsheet that embodies the casemix design. It provides details of the constituent elements that contribute to HRG grouping, and it contains reference data such as the ICD-10 and OPCS-4 codes utilised in the design. It contains the procedure and diagnosis hierarchies pertinent to a specific design, and the Complication and Comorbidities lists for HRG subchapters. The spreadsheet also includes information on Programme Budgeting Category (PBC) mapping, as well as a comprehensive list of HRG codes and labels.
- The **Trimpoints Workbook** identifies the Episode and Spell-level Trimpoints used to collect reference costs for each HRG in a given year. This is published alongside the Methodology Document.

Appendix A: Trouble Shooting With Installation

If .NET Framework 4.5 is uninstalled or the Grouper is manually copied to a system without .NET, an error message will appear when attempting to run it: *“To run this application, you must install one of the following version of the .NET Framework: v4”*.

If the Grouper is manually copied from a 64 to a 32-bit operating system, the following error message will appear when attempting to run it:

“[Grouper Path]\MSVCP120.dll is either not designed to run on Windows or it contains an error. Try installing the program again using the original installation media or contact your system administrator or the software vendor for support” or *“Error: DLL pointer is unloadable: 193”*.

If the Grouper is manually copied without including the Microsoft Visual C++ runtime libraries that are installed with the grouper (MSVCP120.DLL and MSVCR120.DLL) an error message will appear when attempting to run it:

“The program can’t start because MSVCP120.dll is missing from your computer. Try reinstalling the program to fix this problem.” or *“The program can’t start because MSVCR120.dll is missing from your computer. Try reinstalling the program to fix this problem.”* or *“Error: DLL pointer is unloadable: 126”*

If the Grouper is manually copied to a system that does not meet the minimum requirements of Vista SP2 the following error message will appear when attempting to run it:

“[Grouper Path]\GUIShell.exe is not a valid Win32 application.” or *“[Grouper Path]\HRGGrouperc.exe is not a valid Win32 application.”*