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Chapter Summaries

HRG4+ 2017/18 Reference Costs Grouper

RC 17/18

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Contents

Introduction

This 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.

As well as the changes highlighted for each subchapter, there are also cross-chapter changes from the HRG4+ 2016/17 Reference Costs design that are explained below.

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).

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 subchapters 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 activity within subchapters or between subchapters.

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 mapping to appropriate resource HRGs. For example, ***P13.8 Other specified other operations on female perineum*** maps to a base HRG root of **MA22 Minor Lower Genital Tract Procedures**, but there are several different procedures that may be recorded using this code. New combination codes have been created to identify higher resource procedures; ***P138+REP Reconstruction of female perineum***, which maps to base HRG root **MA04 Intermediate Open Lower Genital Tract Procedures**, and lower resource procedures; ***P138+Y20 Biopsy of female perineum***, which maps to base HRG root **MA23 Minimal Lower Genital Tract Procedures**.

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 resource HRG than appropriately coded activity within the same 3-digit OPCS code category. For example, ***T01.9 Unspecified partial excision of chest wall*** has been remapped from base HRG root **DZ63 Major Thoracic Procedures** to **DZ71Z Minor Thoracic Procedures** to ensure that it does not map to a higher resource HRG than a more specific code within the same OPCS-4 category, ***T01.3 Excision of lesion of chest wall***.

OPCS-4 Paired code review

Within the OPCS-4 classification there are certain codes that are considered to be “Paired codes”, in that there are specific rules around when these codes should be recorded together and the sequencing of these 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.

Within the HRG4+ design there is subsidiary procedure code logic e.g. laparoscopic, revisional, bilateral etc. Where this logic is applicable for paired codes, in particular in heart and eye surgery, this logic is unable to be reached as the subsidiary procedure code is not necessarily immediately adjacent to the dominant procedure, depending on the sequencing rule of these paired codes.

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 coding rules, the subsidiary logic is applied to the coding combination and the appropriate HRG is generated. For example, national coding rules state that when performed together, the repair of atrioventricular septum defect should be coded supplementary (i.e. sequenced after) the code for repair of tetralogy of fallot, and as a paired code, any subsidiary approach and site codes should be sequenced after the second code of the pair. However, the tetralogy of fallot procedures have a higher procedure hierarchy and as the dominant procedure, the subsidiary revisional code is not associated with this code, so no escalation will occur. To ensure that the revisional escalation logic applied to the congenital cardiac surgery HRGs can work as intended, it is therefore necessary to create combination codes such as ***K041+K095 Repair of tetralogy of Fallot using valved right ventricular outflow conduit and primary repair***

of defect of atrioventricular septum, which effectively combines the two procedures into a single code, so that the associated revisional subsidiary procedure code can be used to escalate this procedure as appropriate. Where the two procedures when recorded individually would have escalated to a different HRG, the paired combination code has been mapped directly to that HRG, to ensure that the most appropriate HRG is derived.

Subchapter AA – Nervous System Procedures and Disorders

Subchapter **AA Nervous System Procedures and Disorders** covers all-age procedures and adult diagnoses relating to the nervous system.

It includes activity undertaken in inpatient, day case and non-admitted care settings.

It does not include percutaneous procedures on the nervous system; these map to Subchapter **YA Neurological Imaging Interventions**.

The neurosurgery HRGs in this subchapter are split into a maximum of seven levels of complexity (minimal, minor, intermediate, major, very major, complex and very complex).

In addition, there are HRGs for specific high-cost specialised activity, such as the insertion of neurostimulators and intrathecal drug delivery pumps, and stereotactic radiosurgery.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**101**	**101**
Total HRG Roots	**29**	**29**
Procedure-driven HRGs	51	51
Diagnosis-driven HRGs	50	50
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

Multiple procedure logic is employed within the procedure-driven HRGs in this subchapter, as are age splits: there are specific HRGs for adult activity (19 years and over) and others for paediatric activity (18 years and under). Escalation to an HRG with a higher expected resource use also occurs wherever there is advanced monitoring – e.g. EPR during surgery, or where a procedure is revisional.

The neurophysiology HRGs are split into neuropsychology, EEG, EMG and nerve conduction studies, and sleep studies. These HRGs, along with the minimal procedure-driven HRGs, employ maximum length of stay logic to ensure that minor procedures, such as EEGs, are not used to determine the HRG for a long-stay medical patient, e.g. an elderly person who has had a stroke.

The adult diagnosis-driven HRGs are differentiated by disorder type.

Interactive CC splits are employed within the majority of both diagnosis-driven and procedure-driven HRGs within this subchapter – up to a maximum of six levels – to more appropriately differentiate resource usage between routine and complex patients.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Changes made to logic

Logic has been added to escalate operations on mid-brain tumours, identified through relevant ICD-10 diagnosis codes e.g. neoplasms of the supratentorial region of brain and phakomatosis, to a higher expected resource HRG. Due to the location of these tumours the surgery is more complex than operating on tumours in other, more accessible, parts of the brain.

Logic has been added to escalate subdural haematoma surgery to a higher resource HRG when a subsidiary code indicating craniotomy (open) approach is recorded. This differentiates this more complex surgery from the simpler burrhole approach which is used to treat less severe subdural haematomas.

Logic has been expanded to map certain procedures to the pain management HRGs (**Subchapter AB Pain Management**), where a diagnosis indicating pain disorder (including the expansion of the list of ICD-10 diagnosis codes that represent conditions likely to require pain management care) and where Treatment Function Code (TFC) 191 Pain Management or TFC 241 Paediatric Pain Management is recorded. This has led to a shift in activity from this subchapter to the pain management HRGs.

Remapping of codes to more appropriately reflect resource usage

OPCS-4 code ***A48.5 Reprogramming of neurostimulator adjacent to spinal cord*** has been remapped from a base HRG root **AA55 Minor Intracranial Procedures, 19 years and over** to **AA57 Minimal Intracranial Procedures** to reflect the resource usage associated with this non-invasive procedure.

OPCS-4 codes ***V02.8 Other specified other plastic repair of cranium*** and ***V02.9 Unspecified other plastic repair*** of have been remapped from base HRG root **AA53 Major Intracranial Procedures** to **UZ01Z Data Invalid for Grouping** as these are .8 Other specified and .9 Unspecified codes from an extended category and as coding rules state they should not be used.

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

Within this subchapter 19 ***.8 Other specified*** codes have been remapped to lower resource HRGs, with one, ***A70.8 Other specified neurostimulation of peripheral nerve***, remapped to be ignored for grouping due to the fact that the 3-digit category is too broad to be able to determine expected resource usage. One new combination code, ***L348+REP Other specified open repair of cerebral artery*** has been created to identify this specific procedure and map accordingly.

OPCS- 4 Unspecified (-.9) global review

Within this subchapter 12 ***.9 Unspecified*** codes have been remapped to lower resource HRGs, many as a result of the remapping of ***the .8 Other specified*** codes. One, ***A70.9 Unspecified neurostimulation of peripheral nerve***, has been remapped to be ignored for grouping due to the fact that the 3-digit category is too broad to be able to determine expected resource usage.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

Within this subchapter new code ***A82.1 Quantitative sensory testing*** has been mapped to base HRG root **AA33 Conventional EEG, EMG or Nerve Conduction Studies** to reflect that it is a type of nerve study.

Subchapter AB – Pain Management

Subchapter **AB Pain Management** relates to services for pain management and covers activity for patients of all ages.

It includes activity undertaken in inpatient, day case and non-admitted care settings.

The HRGs within this subchapter are separated into specific types of procedures rather than by complexity level. Therefore, there are HRGs specific to high-volume pain management procedures, for example joint injections or acupuncture.

There are also HRGs for specific high-cost specialised activity, such as the insertion of neurostimulators, the insertion of intrathecal drug delivery pumps, and radiofrequency ablation or cryoablation, for pain management.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**14**	**13**
Total HRG Roots	**14**	**13**
Procedure-driven HRGs	14	13
Diagnosis-driven HRGs	0	0
Age Splits	No	No
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	Yes	Yes

Eleven of the HRGs within this subchapter can be derived with a primary diagnosis indicating pain management. This is to distinguish them from activity where the same procedures are undertaken for the treatment of other conditions.

The majority of the HRGs within this subchapter have maximum length of stay logic to ensure that minor procedures, such as injection into joint, are not used to determine the HRG for a long stay medical patient, for example, a person who has suffered a stroke.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

New HRGs have been created

A new HRG, **AB24Z Alteration of Function of Nerve for Pain Management**, has been created for the application of capsaicin patches. A procedure-specific HRG is required to appropriately capture the nature of this specialist procedure including the significant cost of the patch(es).

Changes made to logic

The majority of pain management activity is undertaken in the non-admitted care (outpatient) setting, with procedure codes such as joint injections and therapeutic infusions. These same procedures can also be used to treat other non-pain related conditions, so it has not been possible previously to appropriately identify the majority of pain management activity. As diagnosis codes cannot be captured in the outpatient setting, new logic has been introduced so that Treatment Function Code (***TFC) 191 Pain Management*** and ***TFC 241 Paediatric Pain Management*** are used to identify pain management procedures, across both admitted patient care (APC) and non-admitted care settings, and map to the appropriate HRG in this subchapter. Previously this activity would have been either ignored for grouping in

outpatients or mapped to diagnosis-driven HRGs, primarily in Subchapter **HC Spinal Procedures and Disorders** in APC.

Over a hundred ICD-10 diagnosis codes have been added to the AB_Paindiag list as these represent conditions that are likely to require pain management, such as ***M43.0 Spondylolysis*** and ***M48.0 Spinal stenosis***. This ensures that procedures appropriately map to the HRGs within this subchapter where there is a primary diagnosis code from this expanded list, which is indicative that the patient is receiving pain management treatment.

Pain diagnosis logic (both primary diagnosis and TFC check) has been added to six cranial nerve procedure codes, including insertion and renewal of cranial nerve stimulators and electrodes. This is to ensure that when these procedures are undertaken for pain management they appropriately map to HRGs within this subchapter, rather than Subchapter **AA Nervous System Procedures and Disorders**.

Incontinence logic has been removed from ***A70.4 Insertion of neurostimulator electrodes into peripheral nerve*** to reflect that there is a combination code for temporary insertion which already maps appropriately in the design to various HRGs depending on diagnosis. This code alone is used for a different, lower expected resource procedure, and will now default to **AB15Z Radiofrequency Ablation or Cryoablation, for Pain Management**. This change is expected to result in a shift in activity from Subchapters **LB Urological and Male Reproductive System Procedures and Disorders** and **FF Digestive System Open and Laparoscopic Procedures** to this subchapter.

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

Within this subchapter, seven new combination codes have been created, including ***T578+Y38 Injection of therapeutic substance into fascia*** and associated site-specific combination codes. These codes have pain management logic to map to **AB22Z Trigger Point Injection for Pain Management**.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

New OPCS-4.8 code ***W92.6 Chemical synovectomy*** and associated new orthopaedic site-specific combination codes will map to **AB19Z Injection of Therapeutic Substance into Joint for Pain Management** with a pain related primary diagnosis or an appropriate pain management TFC, and a length of stay of zero days.

Subchapter BZ – Eyes and Periorbita Procedures and Disorders

Subchapter **BZ Eyes and Periorbita Procedures and Disorders** covers procedures for patients of all ages and diagnoses for adults relating to the eyes and periorbita, delivered in admitted or non-admitted care settings.

Composition and Concepts		
	RC17/18	**RC16/17**
Total HRGs	**94**	**94**
Total HRG Roots	**48**	**48**
Procedure-driven HRGs	90	90
Diagnosis-driven HRGs	4	4
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

The HRG roots are separated based on the type of eye surgery – e.g. cataract or lens, ocular motility etc. – and the related HRGs are split into up to six levels of complexity (minor, intermediate, major, very major, complex and very complex).

Multiple procedure logic is employed within the procedure-driven HRG roots within this subchapter, as are age splits: there are specific HRGs for adult activity (19 years and over) and others for paediatric activity (18 years and under) within many of the BZ HRG roots. There are also age-specific HRG roots that separate adult and paediatric activity at the root level. In addition, some HRG roots in Subchapter BZ employ paediatric age splits, which enables HRGs specific to the treatment of young children (0 to 3 years of age) to be created. Escalation to an HRG root with a higher expected resource use also occurs in this subchapter, where appropriate, when procedures are undertaken under general anaesthetic, are performed bilaterally, or are revisional.

A number of the HRG roots within this subchapter relate to specific high-volume procedures, such as phacoemulsification cataract extraction and lens implantation, and retinal tomography.

The majority of minor procedure HRG roots within this subchapter employ maximum length of stay logic to ensure that minor procedures, such as irrigation of tear duct, are not used to determine the HRG for a long-stay medical patient, e.g. a person who has suffered a stroke.

Interactive CC splits are employed within some of the procedure-driven HRG roots – up to a maximum of three levels – to more appropriately differentiate expected resource usage between routine and complex patients.

The one diagnosis-driven HRG root in this subchapter, **BZ24 Non-Surgical Ophthalmology**, which is exclusively for adult activity, has both intervention and interactive CC splits.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Changes made to logic

OPCS-4 code ***C12.1 Excision of lesion of eyelid*** has been remapped to a lower resource base HRG root, **BZ46 Minor Oculoplastics Procedures**, to reflect the fact that usually this procedure will be the removal of simple warts or skin tags. However, diagnosis-qualified logic has been added to ensure that when this procedure is undertaken to treat a malignancy or a suspected malignancy, which is more complex and would typically incur pathology costs, there is escalation to HRG root **BZ45 Intermediate Oculoplastics Procedures**.

Remapping of OPCS-4 codes to more appropriately reflect resource usage

A review of eye injection and implant procedures has been undertaken, which has resulted in:

- The remapping of all surgical recession and resection of eye muscle procedures that mapped to base HRG root **BZ74 Minor Ocular Motility Procedures** to **BZ73 Intermediate Ocular Motility Procedures**, leaving only ***C37.8 Other specified other operations on muscle of eye***, which is predominantly used for injection of botulinum toxin (an unbundled high cost drug) mapping to base HRG root **BZ74 Minor Ocular Motility Procedures** where length of stay is zero. This enables a more appropriate distinction between the injection cost (excluding drug), which is significantly lower than the surgical ocular motility procedures.
- The remapping of ***C86.7 Injection of therapeutic substance around the eye*** from base HRG root **BZ87 Minor Vitreous Retinal Procedures** to **BZ86 Intermediate Vitreous Retinal Procedures** to more appropriately reflect the expected resource usage of this procedure.
- The remapping of **C89.1 Insertion of sustained release device into posterior segment of eye** from base HRG root **BZ86 Intermediate Vitreous Retinal Procedures** to **BZ84 Major Vitreous Retinal Procedures**, to more appropriately reflect the expected resource usage of this specialised procedure.
- An improved recognition of the expected resource usage associated with the stay in hospital required when patients are admitted for plaque radiotherapy in the remapping of ***C82.4 Plaque radiotherapy to lesion of retina***, and recognition of ***C84.8 Other specified other operations on retina*** (the code for removal of radioactive plaque) so that the insertion alone maps to **BZ81 Complex Vitreous Retinal Procedures** and insertions plus removal will map to **BZ80 Very Complex Vitreous Retinal Procedures**.

A review of ophthalmic tests has been undertaken, which has resulted in:

- The remapping of the majority of ophthalmic test procedure codes to lower resource HRGs to reflect that although many of these tests are time consuming they do not consume as much resource usage as surgical vitreous retinal procedures.
- Multiple-procedure escalation logic being removed from most ophthalmic tests to ensure that when multiple tests are undertaken they are not inappropriately escalated into higher expected resource, mainly surgical, HRGs, rather the ophthalmic test activity remains within the HRG root that best reflects its expected resource usage.

The exception to this is when ***A84.5 Electroretinography NEC*** and an additional electrooculography procedure has been recorded, ensuring that these ophthalmic tests appropriately escalate to a higher resource HRG when this combination of procedures are undertaken.

- The remapping of ***C518+Y532 Corneal pachymetry*** to be ignored for grouping, as this simple test is either part of an outpatient attendance or is expected to be no more resource intensive than a standard outpatient consultation.
- The creation of three new combination codes specific to ophthalmic tests; ***A848+Z17 Nerve conduction studies of muscle of eye*** mapped to base HRG root **BZ84 Major Vitreous Retinal Procedures**, ***C873+Z352 Tomography evaluation of ophthalmic*** mapped to base HRG root **BZ87 Minor Vitreous Retinal Procedures** and ***C868+Y442 Monitoring of pressure of eye*** being ignored for grouping as the latter is considered no more resource intensive than a standard outpatient consultation.

OPCS-4 code ***C09.3 Replacement of medial canthal tendon using periosteal strip*** has been remapped from base HRG root **BZ45 Intermediate Oculoplastics Procedures** to **BZ54 Major, Orbit or Lacrimal Procedures** to match the mapping of the other canthal tendon procedures within the same 3-digit OPCS category.

Combination code ***C518+PDT Photodynamic therapy to cornea*** has been remapped from base HRG root **BZ62 Very Major, Cornea or Sclera Procedures** to **BZ63 Major, Cornea or Sclera Procedures**, to reflect that although there is a significant cost associated with the photodynamic drug, this is not expected to be as high as undertaking surgical procedures.

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

Within this subchapter two ***.8 Other specified*** codes have been remapped to lower expected resource HRGs. In addition, two new combination codes ***C648+Y18 Freeing of adhesions of iris*** and ***C048+Y032 Renewal of prosthetic replacement for eyeball*** have been created to identify these specific procedures and mapped accordingly.

OPCS- 4 Unspecified (-.9) global review

Within this subchapter two ***.9 Unspecified*** codes have been remapped to lower resource HRGs.

OPCS- 4 Paired code review

Within this subchapter 123 paired combination codes have been created to ensure the appropriate escalation of revisional, bilateral and operations under general anaesthetic, where coding rules state that paired code sequencing applies.

Subchapter CA – Ear, Nose, Mouth, Throat and Neck Procedures

Subchapter **CA Ear, Nose, Mouth, Throat and Neck Procedures** covers ear, nose, mouth, throat and neck procedures for patients of all ages. It includes activity undertaken in inpatient, day case and non-admitted care settings.

The HRG roots within this subchapter are generally divided based on the site of surgery – e.g. neck, ear, nose etc. – but there are also HRG roots specific to maxillofacial and audiology procedures.

Related HRG roots are divided into a maximum of seven levels of complexity (minimal, minor, intermediate, major, very major, complex and very complex), although HRG roots at the high end of the complexity range are not employed for some sites or types of procedures, on clinical advice.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**122**	**120**
Total HRG Roots	**70**	**70**
Procedure-driven HRGs	122	120
Diagnosis-driven HRGs	0	0
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

There are also procedure-specific HRG roots for high-volume procedures, e.g. tonsillectomy, nasal polypectomy and reduction of fracture of nasal bone, and for specialised procedures, such as cochlear implants.

Multiple procedure logic is employed throughout the HRG roots within this subchapter, as are age splits: there are specific HRGs for adult activity (19 years and over) and others for paediatric activity (18 years and under). There are now also HRGs specific to the treatment of infants (0 to 1 year of age) as well as those for older children (2 to 18 years). For some audiology activity, there are HRGs specific to preschool-aged children (4 years and under) and school-aged children (5 to 18 years). Escalation to an HRG root with a higher expected resource use also occurs in this subchapter, where appropriate, when procedures are performed bilaterally or where the patient is being treated for vascular nasal tumours.

The majority of the minor and minimal procedure HRG roots within this subchapter have maximum length of stay logic to ensure that minor procedures, such as drainage of ear wax, are not used to determine the HRG for a long-stay medical patient, e.g. a person who has suffered a stroke.

Interactive CC splits are employed within many of the more complex HRG roots within this subchapter – up to a maximum of three levels – to more appropriately differentiate expected resource usage between routine and complex patients.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

New HRGs have been created/ Existing HRGs deleted

Due to a shift in activity as a result of the procedure hierarchy review there is sufficient activity within HRG root **CA01 Complex Neck Procedures** to warrant differentiating resource usage between patients with varying levels of complications and comorbidities. **CA01Z Complex Neck Procedures** has been deleted and replaced with three new 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**.

Younger children undergoing a tonsillectomy procedure typically consume much greater resource than older children undergoing the same procedure, with older children typically consuming a similar level of resource to adult patients. To reflect this, the age split for HRG root **CA60 Tonsillectomy** has been amended so that **CA60A Tonsillectomy, 19 years and over** and **CA60B Tonsillectomy, 18 years and under** have been deleted and replaced with **CA60C Tonsillectomy, 4 years and over** and **CA60D Tonsillectomy, 3 years and under**.

Changes made to logic

Escalation logic has been added to OPCS-4 codes ***D28.2 Examination of ear under anaesthetic*** and ***E27.6 Examination of pharynx under anaesthetic*** to escalate to a higher expected resource HRG where a subsidiary procedure indicating general anaesthetic, is recorded. In addition, the former code has also been remapped to a lower resource base HRG root**CA55 Minimal Ear Procedures**, where length of stay is less than two days. This appropriately reflects the resource difference between exams under local versus general anaesthetic.

Remapping of OPCS-4 codes to more appropriately reflect resource usage

The creation of a new subchapter specific to neck imaging interventions, Subchapter **YC Neck Imaging Interventions**, has resulted in the creation of under image control combination codes for several neck procedures e.g. excisions, biopsies and drainage of neck glands and lymph nodes. These procedure codes continue to map to Subchapter **CA Ear, Nose, Mouth, Throat and Neck Procedures** when not done under image control. This will result in a shift of activity from this subchapter to Subchapter **YC Neck Imaging Interventions**.

In addition, logic has been added to several neck procedures e.g. dilation and removal of calculus of salivary glands, to map to HRGs within the new subchapter **YC Neck Imaging Interventions** when subsidiary codes indicating the procedure has been undertaken under image control are recorded.

A review of audiological tests has been undertaken, which has resulted in the:

- Remapping of ***D24.5 Transtympanic electrocochleography*** to base HRG root **CA38 Evoked Potential Recording** to reflect that this is a form of EPR.
- Remapping of hearing aid implant and maintenance procedures to be ignored for grouping as these are part of a hearing aid service. This has also resulted in the deletion of the ‘renewal of’ combination code.

- Creation of new combination codes for ear exam and otoscopy to ensure that they are ignored for grouping, as they are considered to be no more resource intensive than a standard outpatient consultation.

OPCS-4 code ***X39.3 Intranasal administration of therapeutic substance*** has been remapped from being ignored for grouping to base HRG root **CA12 Major Treatment of Epistaxis**, this being the appropriate OPCS code for the insertion of haemostasis agents used to treat epistaxis.

A new combination code, ***E34.2+Y40.3 Microtherapeutic endoscopic resection of lesion of larynx and balloon dilation*** has been created specific to this procedure and mapped to base HRG root **CA67 Complex Therapeutic Endoscopic, Larynx or Pharynx Procedures** to reflect resource usage.

OPCS-4 code ***D05.4 Attention to fixtures for auricular prosthesis*** has been remapped to base HRG root **CA55 Minimal Ear Procedures**, and ***E42.7 Removal of tracheostomy tube*** has been remapped to base HRG root **CA85 Minor, Mouth or Throat Procedures**. Both of these procedures have been remapped to lower expected resource HRGs to reflect that they consume less resource than the equivalent insertion of device procedures.

Combination code ***L671+NECK Biopsy of artery NEC of neck*** has been deleted and replaced with combination code ***L671+O121 Biopsy of temporal artery***, which has been mapped to a new procedure-specific HRG in Subchapter **YQ Vascular Procedures and Disorders**, **YQ43Z Biopsy of Temporal Artery**. This will result in a shift of activity from HRG root **CA05 Minor Neck Procedures** to this new HRG in Subchapter **YQ Vascular Procedures and Disorders**.

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

Within this subchapter 19 ***.8 Other specified*** codes have been remapped to lower expected resource HRGs. In addition, six new combination codes have been created to identify specific procedures, namely ‘attention to’, ‘removal of’ and ‘renewal of’ grommets, cauterisation of nasal septum, sialoplasty and Karapandzic flap repair of lip, mapped accordingly.

OPCS- 4 Unspecified (-.9) global review

Within this subchapter 12 ***.9 Unspecified*** codes have been remapped to lower expected resource HRGs.

Changes made to accommodate OPCS-4.8 update

Changes to the OPCS-4 procedure classification, implemented from 1 April 2017, have been incorporated into the HRG4+ design.

Within this subchapter four codes have been mapped; ***D06.4 Graft of skin to external ear*** and ***D06.5 Flap of skin to external ear*** to base HRG root **CA53 Intermediate Ear Procedures**, and ***E09.7 Graft of skin to external nose*** and ***E66.1 Flap of skin to external nose*** to base HRG root **CA23 Intermediate Nose Procedures**.

Subchapter CB – Ear, Nose, Mouth, Throat and Neck Disorders

Subchapter **CB Ear, Nose, Mouth, Throat and Neck Disorders** includes all ear, nose, mouth, throat and neck disorders for adults only. It includes activity undertaken in inpatient and day case settings.

The HRGs within this subchapter are separated into two HRG roots, malignant and non-malignant ear, nose, mouth, throat and neck disorders.

Interactive CC splits are employed within both of the HRG roots within this subchapter – up to a maximum of three levels – to more appropriately differentiate expected resource usage between routine and complex patients. Intervention splits are also employed within both HRG roots.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**12**	**12**
Total HRG Roots	**2**	**2**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	12	12
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter CD – Dental and Orthodontic Procedures

Subchapter **CD Dental and Orthodontic Procedures** covers dental and orthodontic procedures for patients of all ages. It includes activity undertaken in inpatient, day case and non-admitted care settings.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**23**	**23**
Total HRG Roots	**12**	**12**
Procedure-driven HRGs	23	23
Diagnosis-driven HRGs	0	0
Age Splits	Yes	Yes
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	Yes	Yes

The HRG roots within this subchapter are divided based on the type of procedure – e.g. tooth extractions, orthodontic appliance procedures. Related HRG roots are further divided based on up to three levels of complexity (minor, intermediate and major).

Most HRG roots within this subchapter employ age splits: there are specific HRGs for adult activity (19 years and over) and others for paediatric activity (18 years and under).

All the HRG roots within this subchapter have maximum length of stay logic to ensure that minor procedures, such as tooth extraction, are not used to determine the HRG for a long-stay medical patient, e.g. a person who has suffered a stroke.

Other mouth and throat procedures are covered alongside head, neck and ear procedures within Subchapter **CA Ear, Nose, Mouth, Throat and Neck Procedures**.

Dental disorders are covered in Subchapter **CB Ear, Nose, Mouth, Throat and Neck Disorders**.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Remapping of OPCS-4 codes to more appropriately reflect resource usage

OPCS-4 code ***F15.8 Other specified other orthodontic operations*** has been remapped from base HRG root **CD03 Minor Dental Procedures** to **UZ06 Poorly coded procedure for Casemix grouping purposes** as this code is a .8 Other specified code from an extended category and as coding rules state it should not be used.

Changes made to accommodate OPCS-4.8 update

Changes to the OPCS-4 procedure classification, implemented from 1 April 2017, have been incorporated into the HRG4+ design.

Within this subchapter new code ***F09.6 Coronectomy*** has been mapped to base HRG root **CD01 Major Dental Procedures** to reflect the resource usage associated with this procedure.

Subchapter DZ – Respiratory System Procedures and Disorders

Subchapter **DZ Respiratory System Procedures and Disorders** covers both adult respiratory diagnoses and thoracic and respiratory procedures for patients of all ages. The subchapter includes activity undertaken in inpatient, day case and non-admitted care settings.

It does not include percutaneous procedures on the respiratory system; these map to Subchapter **YD Thoracic Imaging Interventions**.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**176**	**176**
Total HRG Roots	**52**	**52**
Procedure-driven HRGs	46	46
Diagnosis-driven HRGs	130	130
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

The surgical HRGs within this subchapter are split into five levels of complexity (minor, intermediate, major, complex and very complex). There is also an HRG specific to lung transplantation.

Multiple procedure logic is employed throughout the surgical HRGs within this subchapter, as are age splits: there are specific HRGs for adult activity (19 years and over) and others for paediatric activity (18 years and under). There are also HRGs specific to the treatment of infants (0 to 1 year of age) and those for older children (2 to 18 years). Escalation to an HRG with a higher expected resource use also occurs when procedures are performed bilaterally.

There are HRGs specific to bronchoscopic procedures that are split into three levels of complexity for therapeutic procedures, and there are specific HRGs for diagnostic procedures. The latter are split into adult (19 years and over) and paediatric (18 years and under) HRGs.

There are also HRGs specific to respiratory physiology procedures, several of which are split into adult- and paediatric-specific HRGs.

All the minor procedure HRGs, including the respiratory physiology procedure HRGs and the majority of bronchoscopic HRGs within this subchapter have maximum length of stay logic, to ensure that minor procedures, such as oxygen assessment, are not used to determine the HRG for a long-stay medical patient, e.g. a person who has lung cancer.

The adult diagnosis-driven HRGs for respiratory system disorders are disease-specific.

Interactive CC splits are employed within the majority of HRG roots within this subchapter – up to a maximum of five levels – to more appropriately differentiate expected resource usage between routine and complex patients.

In addition, intervention splits, including those for multiple interventions, are also employed within the majority of the diagnosis-driven HRG roots.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

ICD-10 diagnosis code ***B39.9 Histoplasmosis, unspecified*** has been remapped from base HRG root **EB14 Other Acquired Cardiac Conditions** to **DZ11 Lobar, Atypical or Viral Pneumonia**, where the rest of the ICD-10 diagnosis codes in the 3-digit category map, to reflect that this is a lung, rather than heart, disorder.

OPCS- 4 Unspecified (-.9) global review

Within this subchapter, ***T01.9 Unspecified partial excision of chest wall*** has been remapped from base HRG root **DZ63 Major Thoracic Procedures** to **DZ71Z Minor Thoracic Procedures** to match the mapping of the equivalent .3 code within the OPCS rubric.

OPCS-4 Paired code review

Within this subchapter 24 paired combination codes have been created to ensure the appropriate escalation of bilateral thoracic operations, where coding rules state that paired code sequencing applies.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

Within this subchapter new code ***E67.1 Endoscopic thermal bronchoplasty*** has been mapped to base HRG root **DZ67 Major Therapeutic Bronchoscopy** to appropriately reflect the resource usage of this procedure.

In addition '+RIB' combination codes have been created for two new orthopaedic OPCS-4.8 codes ***O17.6 Remanipulation of fracture of bone and fixation using plate*** and ***W24.7 Closed reduction of fracture of bone and fixation using plate*** and then mapped to base HRG root **DZ02 Complex Thoracic Procedures** to reflect the clinical complexity of these procedures.

Subchapter EB – Cardiac Disorders

Subchapter **EB Cardiac Disorders** covers all diagnoses for adults within the Cardiac specialty. It includes activity undertaken in inpatient and day case settings.

The HRGs within this subchapter are split based on disorder type.

Interactive CC splits are employed within the majority of HRGs within this subchapter – up to a maximum of three levels – to more appropriately differentiate expected resource usage between routine and complex patients.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**48**	**48**
Total HRG Roots	**13**	**13**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	48	48
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

ICD-10 diagnosis code ***B39.9 Histoplasmosis, unspecified*** has been remapped from base HRG root **EB14 Other Acquired Cardiac Conditions** to **DZ11 Lobar, Atypical or Viral Pneumonia**, where the rest of the ICD-10 diagnosis codes in the 3-digit category map, to reflect that this is a lung, rather than heart, disorder.

Subchapter EC – Open and Interventional Procedures for Congenital Heart Disease

Subchapter **EC Open and Interventional Procedures for Congenital Heart Disease** covers procedures within Cardiac Surgery that are either carried out on patients 18 years or under, or are carried out as a result of adult patients having congenital heart disease.

All other cardiac procedures are covered within Subchapters **ED Open Cardiac Procedures for Acquired Conditions** or **EY Interventional Cardiology for Acquired Conditions**, which replaced Subchapter **EA Cardiac Procedures**.

Subchapter EC includes activity undertaken in inpatient, day case and non-admitted care settings, for all ages of patient.

The therapeutic congenital cardiac procedure HRGs are split into six levels of complexity (minor, intermediate, major, very major, complex, and very complex).

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	21	21
Total HRG Roots	9	9
Procedure-driven HRGs	21	21
Diagnosis-driven HRGs	0	0
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

Multiple procedure logic is employed within the majority of HRGs within this subchapter. In addition, escalation to a higher expected resource HRG also occurs where there is active cooling during surgery, when percutaneous procedures are undertaken under general anaesthetic or if a procedure is revisional.

There are also HRGs specific to diagnostic congenital cardiac procedures and tests.

All paediatric procedure-driven cardiac activity, with the exception of transplant surgery, maps to the HRGs within Subchapter **EC Open and Interventional Procedures for Congenital Heart Disease**.

The congenital cardiac physiology HRGs have maximum length of stay logic to ensure that minor procedures such as ECGs are not used to determine the HRG for a long stay medical patient, e.g. a person who has suffered a heart attack.

Interactive CC splits are also employed within the majority of the HRGs within this subchapter – up to a maximum of three levels – to more appropriately differentiate expected resource usage between routine and complex patients.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

Percutaneous cardiac procedures within OPCS-4 3-digit categories ***K13 Transluminal repair of defect of septum***, ***K16 Other therapeutic transluminal operation of septum of heart*** and ***L03 Transluminal operations on abnormalities of great vessel***, that are almost exclusively undertaken to treat congenital disorders, have been remapped directly to HRGs

in this subchapter, irrespective of patient age or diagnosis. This reflects the fact that the resource used will be similar for all types of patients. The exception to this is OPCS-4 code ***K16.6 Percutaneous transluminal chemical mediated septal ablation***, which is not mapped directly to this subchapter and has had congenital logic removed, reflecting that this procedure is performed to treat hypertrophic cardiomyopathy which is an inherited, rather than congenital, disorder.

The OPCS-4 codes used to identify resting ECG are now ignored for grouping, as these codes do not indicate any more expected resource usage than occurs at a standard cardiac outpatient attendance.

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

Within this subchapter new combination codes have been created to identify other specified and unspecified temporary pacing, to ensure that these procedures do not take precedence over the procedure that they are assisting, and that escalation to a higher expected resource HRG does not occur when these part-and-parcel procedures are recorded.

OPCS-4 Paired code review

Within this subchapter 50 paired combination codes have been created to ensure the appropriate escalation of revisional and operations performed under general anaesthetic, where coding rules state that paired code sequencing applies.

In addition, 429 paired combination codes have been created within Subchapter **ED Open Cardiac Procedures for Acquired Conditions** and **EY Interventional Cardiology for Acquired Conditions**, which have logic to map to HRGs within Subchapter **EC Open and Interventional Procedures for Congenital Heart Disease**, to appropriately accommodate these procedure codes and reflect the resource usage of the combined procedure operations.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

Within this subchapter several new codes have been authored to differentiate the ‘renewal of’ implantable pacemakers and defibrillators by device type. These have been mapped to the appropriate HRGs within this subchapter based on the equivalent codes for the initial device insertion, to appropriately reflect the device cost.

Subchapter ED – Open Cardiac Procedures for Acquired Conditions

Subchapter **ED Open Cardiac Procedures for Acquired Conditions** covers open cardiac procedures for acquired heart disease for adult patients. It includes activity undertaken in inpatient, day case and non-admitted care settings.

Percutaneous cardiac procedures map to Subchapter **EY Interventional Cardiology for Acquired Heart Disease**.

Procedures that are either carried out on children (patients 18 years or under) or are carried out as a result of patients having congenital heart disease are covered within Subchapter **EC Open and Interventional Procedures for Congenital Heart Disease**.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**50**	**48**
Total HRG Roots	**26**	**24**
Procedure-driven HRGs	50	48
Diagnosis-driven HRGs	0	0
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	No	No

Subchapter **ED Open Cardiac Procedures for Acquired Conditions** consists of HRGs specific to transplant surgery, thoracic aortic surgery, coronary artery bypass and valve replacement / repair procedures and other open procedures on the heart or pericardium.

Varying levels of complexity of surgery are reflected in these HRGs, often through the creation of standard and complex equivalent HRGs.

Multiple procedure logic is employed within the majority of HRGs within this subchapter. In addition, for complex open surgery, escalation to a higher expected resource HRG also occurs where there is active cooling during surgery, if a procedure is revisional or if the primary diagnosis is a heart infection or constricted pericarditis.

Several of the HRGs within this subchapter are specific to high-cost, specialised activity, such as complex aortic aneurysm surgery.

Interactive CC splits are employed within the majority of the HRGs within this subchapter – up to a maximum of three levels – to more appropriately differentiate resource usage between routine and complex patients.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

New HRGs have been created/ Existing HRGs deleted

A cross-chapter review of aortic aneurysm repair has led to the redesign of HRGs within Subchapters **ED Open Cardiac Procedures for Acquired Conditions**, **YQ Vascular Open Procedures and Disorders** and **YR Vascular Imaging Interventions**. Within this subchapter this has led to the creation of three new HRGs:

- **ED16Z Hybrid Repair of Descending Thoracic Aorta or Aortic Arch**
- **ED17Z Very Complex Repair of Descending Thoracic Aorta or Aortic Arch**

- **ED18Z Complex Repair of Descending Thoracic Aorta or Aortic Arch**

These HRGs replace the now deleted **ED10Z Complex Repair of Descending Thoracic Aorta**. These HRGs now accommodate aortic arch repair (identified via the creation of new combination codes), repair of descending thoracic aorta due to revisions or infections, complex arch repair involving other complex cardiac procedures that are not part-and-parcel of aortic arch repair. In addition a hybrid repair HRG that is a specific to what is commonly known as the frozen elephant trunk procedure, which involves both the open surgical repair of the aorta alongside the deployment of an endovascular stent graft, for extensive aortic aneurysms, has been created, to reflect the clinical complexity of this procedure.

OPCS-4 Paired code review

Within this subchapter 429 paired combination codes have been created to ensure the appropriate escalation of revisional and operations performed under general anaesthetic when these procedures are performed for the treatment of congenital heart disease. These combination codes are mapped to base HRG roots within Subchapter **ED Open Cardiac Procedures for Acquired Conditions** to appropriately accommodate these combined procedure codes reflecting the resource usage of both operations.

Subchapter EY – Interventional Cardiology for Acquired Conditions

Subchapter **EY Interventional Cardiology for Acquired Conditions** covers interventional cardiology procedures for acquired conditions for adult patients. It includes activity undertaken in inpatient, day case and non-admitted care settings.

Open procedures for acquired heart disease map to Subchapter **ED Open Cardiac Procedures for Acquired Heart Disease**.

Procedures that are either carried out on patients 18 years or under or are carried out as a result of patients having congenital heart disease are covered within Subchapter **EC Open and Interventional Procedures for Congenital Heart Disease**.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	69	65
Total HRG Roots	28	26
Procedure-driven HRGs	69	65
Diagnosis-driven HRGs	0	0
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

This subchapter consists of HRGs specific to pacemaker and defibrillator procedures, transcatheter aortic valve implantation (TAVI), complex percutaneous repairs, cardiac ablation, electrophysiology studies, coronary angioplasty, cardiac catheterisation and cardiac physiological tests.

Varying levels of complexity of surgery are reflected in these HRGs, often through the creation of standard and complex equivalent HRGs.

Multiple procedure logic is employed within the majority of HRGs within this subchapter. In addition, escalation to a higher expected resource HRG also occurs if specified imaging or other assistance procedures are used to support the undertaking of the procedure, e.g. intravascular ultrasound (IVUS) or fractional flow reserve (FFR).

Several of the HRGs within this subchapter identify high-cost, specialised activity, such as the insertion of implantable cardiac defibrillators and TAVI.

The cardiac physiology HRGs have maximum length of stay logic to ensure that minor procedures such as ECGs are not used to determine the HRG for a long stay medical patient, e.g. a person who has suffered a heart attack.

Interactive CC splits are employed within the majority of the HRGs within this subchapter – up to a maximum of six levels – to more appropriately differentiate expected resource usage between routine and complex patients.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

New HRGs have been created

Four new HRGs have been created specific to identify the additional resource usage associated with patients admitted for major surgery e.g. CABG or valve repair that is

undertaken alongside the implantation of ICD or ICD-CRT, or complex patients that require device extraction before renewal:

- **EY14A Implantation of Cardioverter Defibrillator with Cardiac Resynchronisation Therapy, with Extraction or Major Open Procedure, with CC Score 9+**
- **EY14B Implantation of Cardioverter Defibrillator with Cardiac Resynchronisation Therapy, with Extraction or Major Open Procedure, with CC Score 0-8**
- **EY15A Implantation of Cardioverter Defibrillator, with Extraction or Major Open Procedure, with CC Score 9+**
- **EY15B Implantation of Cardioverter Defibrillator, with Extraction or Major Open Procedure, with CC Score 0-8**

Changes made to logic

Escalation logic has been added to the angioplasty codes that map to base HRG root **EY41 Standard Percutaneous Transluminal Coronary Angioplasty** to escalate to **EY40 Complex Percutaneous Transluminal Coronary Angioplasty** where two angioplasties are performed during the same admission. This is to reflect the resources associated with a change in clinical practice where a vessel noted as needing (non-urgent) attention during first (urgent) angioplasty is repaired in a second angioplasty during the same admission, rather than readmitting a patient at a later date for the treatment.

Remapping of codes to more appropriately reflect resource usage

Percutaneous cardiac procedures within OPCS-4 3-digit categories ***K13 Transluminal repair of defect of septum***, ***K16 Other therapeutic transluminal operation of septum of heart*** and ***L03 Transluminal operations on abnormalities of great vessel***, that are almost exclusively undertaken to treat congenital disorders have been remapped directly to HRGs in subchapter **EC Open and Interventional Procedures for Congenital Heart Disease**, irrespective of patient age or diagnosis. This reflects the fact that the resource used will be similar for these procedures for all types of patients. The exception to this is OPCS-4 code ***K16.6 Percutaneous transluminal chemical mediated septal ablation***, which remains mapped directly to base HRG root **EY22 Complex Other Percutaneous Transluminal Repair of Acquired Defect of Heart** with the congenital logic removed. This is to reflect the fact that this procedure is performed to treat hypertrophic cardiomyopathy which is an inherited, rather than congenital, disorder.

The OPCS-4 codes used to identify resting ECG are now ignored for grouping, as these codes do not indicate any more expected resource usage than occurs at a standard cardiac outpatient attendance.

The ‘removal of’, ‘attention to’, and associated .8 other specified, .9 unspecified OPCS-4 codes within 3-digit category **K56 Transluminal hear assistance operations** have been remapped to base HRG root **EY23 Standard Other Percutaneous Transluminal Repair of Acquired Defect of Heart** to reflect that, unlike the equivalent insertion of intra-aortic balloon pump procedure, there is no device cost associated with these procedures thereby consuming less resource.

OPCS-4 procedure codes indicating catheterisation of both sides of the heart have been remapped to base HRG root **EY42 Complex Cardiac Catheterisation** to reflect the additional expected resource associated with these procedures, when compared to the

catheterisation of just one side of the heart. In addition, logic has been added to OPCS-4 code ***L13.3 Arteriography of pulmonary artery*** to escalate activity to HRG root **EY42 Complex Cardiac Catheterisation** where both pulmonary and coronary angiography has been undertaken, reflecting this additional resource usage.

Existing OPCS-4 codes ***K58.3 Percutaneous transluminal right ventricular biopsy*** and ***K58.4 Percutaneous transluminal left ventricular biopsy*** have been remapped alongside a new combination code ***K232+Y53 Biopsy of lesion of heart wall under image control***, to base HRG root **EY42 Complex Cardiac Catheterisation** to reflect the fact that these are catheterisation with significant pathology costs, rather than percutaneous heart repair procedures.

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

Within this subchapter new combination codes have been created to identify other specified and unspecified temporary pacing, to ensure that these procedures do not take precedence over the procedure that they are assisting, and that escalation to a higher resource HRG does not occur when these part-and-parcel procedures are recorded.

OPCS-4 Paired code review

Within this subchapter 6 paired combination codes have been created to ensure the appropriate escalation of revisional and operations performed under general anaesthetic when these procedures are performed for the treatment of congenital heart disease. These combination codes have been mapped to base HRG roots within this subchapter to appropriately accommodate these combined procedure codes, reflecting the expected resource usage of both operations.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

Within this subchapter several new codes have been authored to differentiate the renewal of implantable pacemakers and defibrillators by device type. These have been mapped to the appropriate HRGs within this subchapter based on the equivalent codes for the initial device insertion, to appropriately reflect the device cost.

Subchapter FD – Digestive System Disorders

Subchapter **FD Digestive System Disorders** covers gastroenterology medicine for adults, delivered in admitted patient care settings.

There are several disease-specific HRG roots within Subchapter FD, but the majority of digestive system disorders are mapped to either the Malignant Gastrointestinal Tract Disorders HRG root or the Non-Malignant Gastrointestinal Tract Disorders HRG root.

Interactive CC splits are employed within six of the seven HRG roots within this subchapter – up to a maximum of four levels – to differentiate the expected resource usage of routine and complex patients.

In addition, intervention splits, including where the presence of multiple interventions influences grouping, are employed within all of the HRG roots in this subchapter.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**54**	**54**
Total HRG Roots	**7**	**7**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	54	54
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Changes made to logic

ICD-10 code ***E34.0 Carcinoid syndrome*** has been upgraded to a value of 2 on the FDFEFFYF_CC complications and comorbidity list to reflect that this is a major CC.

Remapping of codes to more appropriately reflect resource usage

Three ICD-10 congenital diagnosis codes, ***Q39.0 Atresia of oesophagus without fistula***, ***Q39.1 Atresia of oesophagus with tracheo-oesophageal fistula*** and ***Q41.0 Congenital absence, atresia and stenosis of duodenum***, previously U grouped where the patient was 19 years or over. These codes have been remapped to base HRG root **FD10 Non-Malignant Gastrointestinal Tract Disorders**, to reflect that, although extremely rare for a patient to survive to adulthood with these conditions, there are no coding rules preventing the use of congenital diagnosis codes in adults (unlike the ***P Perinatal*** ICD-10 codes that appropriately U group when recorded for adult patients, in accordance with national coding rules).

Subchapter FE – Digestive System Endoscopic Procedures

Subchapter **FE Digestive System Endoscopic Procedures** covers endoscopic digestive system procedures for patients of all ages, delivered in admitted or non-admitted care settings.

It does not include interventions for the treatment of hepatobiliary or pancreatic system disorders, which are covered by Chapter **G Hepatobiliary and Pancreatic System** and Subchapter **YG Hepatobiliary and Pancreatic Imaging Interventions**.

The endoscopic procedure HRG roots within Subchapter FE are differentiated based on the type of scope used and whether the intervention is diagnostic, diagnostic with biopsy, or therapeutic. The therapeutic HRG roots are further differentiated based on complexity.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**41**	**37**
Total HRG Roots	**27**	**22**
Procedure-driven HRGs	41	37
Diagnosis-driven HRGs	0	0
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

Many of the HRG roots in this subchapter employ age splits, and several employ paediatric age splits: there are specific HRGs for adult activity (19 years and over), others for paediatric activity (18 years and under), and still others specific to infants (1 year and under). There are also age-specific HRG roots that separate adult and paediatric activity at the root level.

Interactive CC splits are employed within several HRG roots within this subchapter – up to a maximum of four levels – to differentiate the expected resource usage of routine and complex patients.

Multiple procedure logic is employed within many of the HRG roots within this subchapter, with some activity escalating to an HRG root in Subchapter **FF Digestive System Open and Laparoscopic Procedures**. Escalation to an HRG root with a higher expected resource use also occurs in this subchapter, where appropriate, when a lower gastrointestinal tract endoscopic procedure is combined with an upper gastrointestinal tract endoscopic procedure, and vice versa, or when a biopsy is performed in addition to a diagnostic endoscopic procedure.

The less-resource intensive HRG roots within this subchapter have maximum length of stay logic to ensure that minor procedures, such as diagnostic colonoscopy, are not used to determine the HRG for a long-stay medical patient, e.g. a person who has a gastrointestinal tract bleed.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

New HRGs have been created/ Existing HRGs deleted

With the authoring of new OPCS-4.8 codes for several endoscopic procedures a review of the gastrointestinal endoscopy HRGs has been undertaken, which has resulted in a net increase of four HRGs (with 14 new HRGs replacing ten existing HRGs):

- The creation of two new HRGs, **FE03A Intermediate Therapeutic Endoscopic, Upper or Lower Gastrointestinal Tract Procedures, 19 years and over** and **FE03B Intermediate Therapeutic Endoscopic, Upper or Lower Gastrointestinal Tract Procedures, 18 years and under**. These new HRGs accommodate the new OPCS-4.8 codes specific to endoscopic mucosal resection of lesion procedures. In addition several procedures have been remapped from both the standard and major therapeutic endoscopic HRG roots where this new intermediate HRG is a better fit in terms of expected resource usage. All the procedure codes that map to base HRG root **FE03 Intermediate Therapeutic Endoscopic, Upper or Lower Gastrointestinal Tract Procedures** have logic to escalate to **FE02 Major Therapeutic Endoscopic, Upper or Lower Gastrointestinal Tract Procedures** if an additional intermediate procedure is performed, or the procedure is done under image control, to reflect this additional resource usage.

- With the remapping of activity to HRG root **FE03 Intermediate Therapeutic Endoscopic, Upper or Lower Gastrointestinal Tract Procedures**, there is no longer enough paediatric activity within either **FE02D Major Therapeutic Endoscopic, Upper or Lower Gastrointestinal Tract Procedures, between 2 and 18 years and FE02E Major Therapeutic Endoscopic, Upper or Lower Gastrointestinal Tract Procedures, 1 year and under** to sustain these paediatric splits. These HRGs have therefore been deleted and replaced with **FE02F Major Therapeutic Endoscopic, Upper or Lower Gastrointestinal Tract Procedures, 18 years and under**.

- The paediatric age splits within HRG roots **FE23 Endoscopic or Intermediate, Upper Gastrointestinal Tract Procedures** and **FE37 Endoscopic or Intermediate, Lower Gastrointestinal Tract Procedures** have been revised to split preschool-age children (4 years and under) from school-age children (between 5 and 18 years) rather than 1 year and under / 2 years and over. This has resulted in the deletion of four HRGs to be replaced with:
    - **FE23C Endoscopic or Intermediate, Upper Gastrointestinal Tract Procedures, between 5 and 18 years**
    - **FE23D Endoscopic or Intermediate, Upper Gastrointestinal Tract Procedures, 4 years and under**
    - **FE37C Endoscopic or Intermediate, Lower Gastrointestinal Tract Procedures, between 5 and 18 years**
    - **FE37D Endoscopic or Intermediate, Lower Gastrointestinal Tract Procedures, 4 years and under**
- The combined upper and lower gastrointestinal tract endoscopic procedure HRGs have been redesigned to include a split on device type e.g. colonoscope or sigmoidoscope, in addition to existing splits based on therapeutic procedures, diagnostic with biopsy and diagnostic-only procedures. This has also enabled better differentiation of paediatric combined procedures, irrespective of type, to reflect that all procedures on children are expected to consume additional resource than the same procedures on adults. This has resulted in the deletion of four HRGs to be replaced with:

- **FE40Z Combined Upper and Lower Gastrointestinal Tract Therapeutic Endoscopic Procedures Using Colonoscope, 19 years and over**
- **FE41Z Combined Upper and Lower Gastrointestinal Tract Therapeutic Endoscopic Procedures Using Sigmoidoscope, 19 years and over**
- **FE42Z Combined Upper and Lower Gastrointestinal Tract Diagnostic Endoscopic Procedures Using Colonoscope with Biopsy, 19 years and over**
- **FE43Z Combined Upper and Lower Gastrointestinal Tract Diagnostic Endoscopic Procedures Using Sigmoidoscope with Biopsy, 19 years and over**
- **FE44Z Combined Upper and Lower Gastrointestinal Tract Diagnostic Endoscopic Procedures Using Colonoscope, 19 years and over**
- **FE45Z Combined Upper and Lower Gastrointestinal Tract Diagnostic Endoscopic Procedures Using Sigmoidoscope, 19 years and over**.
- **FE46Z Upper Gastrointestinal Tract Endoscopic Procedure, with Colonoscopy or Sigmoidoscopy, 18 years and under**

Changes made to logic

ICD-10 code ***E34.0 Carcinoid syndrome*** has been upgraded to a value of 2 on the FDFEFFYF_CC complications and comorbidity list to reflect that this is a major CC.

Remapping of OPCS-4 codes to more appropriately reflect resource usage

OPCS-4 code ***H26.4 Endoscopic cryotherapy to lesion of sigmoid colon using rigid sigmoidoscope*** has been remapped from base HRG root **FE02 Major Therapeutic Endoscopic, Upper or Lower Gastrointestinal Tract Procedures** to base HRG root **FE01 Complex Therapeutic Endoscopic, Upper or Lower Gastrointestinal Tract Procedures** to map the procedure to the same HRG as other radiofrequency ablation and cryoablation procedures, and appropriately reflect the resource usage associated with the probes and catheters used.

Five new combination codes specific to endoscopic gastrointestinal tract procedures, such as endoscopic insertion of haemostatic powder, pressure monitoring, insertion of stent (to differentiate from tube) and feeding tube procedures, have been created and mapped to the appropriate resource HRGs.

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

Within this subchapter four new combination codes, ***G448+Y378 Fibreoptic endoscopic introduction of substance into upper gastrointestinal tract***, ***G458+Y442 Fibreoptic endoscopic monitoring of pressure in organ of upper gastrointestinal tract***, ***G478+Y763 Endoscopic intubation of stomach*** and ***J608+Y763 Endoscopic operation on pancreatic duct*** have been created to identify these specific procedures, and mapped accordingly to the appropriate HRG root based on expected resource usage. The latter procedure would have previously mapped to HRGs within Subchapter **GA Hepatobiliary and Pancreatic System Open and Laparoscopic Procedures**.

OPCS- 4 Unspecified (-.9) global review

Within this subchapter, ***G79.9 Unspecified therapeutic endoscopic operations on ileum*** has been remapped from base HRG root **FE01 Complex Therapeutic Endoscopic, Upper or Lower Gastrointestinal Tract Procedures** to **FE20 Therapeutic Endoscopic Upper Gastrointestinal Tract Procedures, 19 years and over**, to match the mapping of the equivalent .2 code within the OPCS-4 rubric.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

Within this subchapter five codes relating to endoscopic submucosal resection have been mapped to new HRG root, **FE03 Intermediate Therapeutic Endoscopic, Upper or Lower Gastrointestinal Tract Procedures**. In addition, ***G20.1 Fibreoptic endoscopic coagulation of bleeding lesion of oesophagus*** and ***G46.2 Fibreoptic endoscopic coagulation of bleeding lesion of upper gastrointestinal tract*** have been mapped to base HRG root **FE20 Therapeutic Endoscopic Upper Gastrointestinal Tract Procedures, 19 years and over** to appropriately reflect resource usage.

Subchapter FF – Digestive System Open and Laparoscopic Procedures

Subchapter **FF Digestive System Open and Laparoscopic Procedures** covers both laparoscopic and open surgical digestive system procedures for patients of all ages, delivered in admitted or non-admitted care settings.

It does not include interventions for the treatment of hepatobiliary or pancreatic system disorders, which are covered by Chapter **G Hepatobiliary and Pancreatic System** and Subchapter **YG Hepatobiliary and Pancreatic Imaging Interventions**.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	113	112
Total HRG Roots	36	35
Procedure-driven HRGs	113	112
Diagnosis-driven HRGs	0	0
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

The surgical HRG roots within this subchapter are divided based on the site of surgery – e.g. oesophagus and stomach, small intestine, large intestine, etc. – with related HRGs separated by level of complexity (minor, intermediate, major, very major, complex and very complex). Not all complexity levels are relevant to each site, with a maximum of five levels of complexity applicable to any single site.

Some endoscopic procedures have been mapped to Subchapter **FF Digestive System Open and Laparoscopic Procedures** as their expected resource use is more akin to clinically similar digestive system procedures performed laparoscopically than to other endoscopic procedures. Additionally, some endoscopic procedures group to this subchapter in order to keep clinically similar activity within the same subchapter, e.g., procedures undertaken to treat obesity.

There are also procedure-specific HRG roots for high-volume procedures such as hernia repair or appendicectomy, and for specialised procedures such as bariatric surgery or insertion of a neurostimulator for the treatment of incontinence.

Many of the HRG roots in this subchapter employ age splits, and several employ paediatric age splits: there are specific HRGs for adult activity (19 years and over), others for paediatric activity (18 years and under), and still others specific to infants (1 year and under). There are also age-specific HRG roots that separate adult and paediatric activity at the root level.

Interactive CC splits are employed within the majority of HRG roots within this subchapter – up to a maximum of five levels – to differentiate the expected resource usage of routine and complex patients.

Multiple procedure logic is employed within many of the HRG roots within this subchapter. Escalation to an HRG root with a higher expected resource use also occurs in this subchapter, where appropriate, when certain procedures, e.g. hernia repair, are performed bilaterally or are revisional.

Several procedures that group to this subchapter will group to different HRGs depending on which primary diagnosis is coded alongside the dominant procedure in the patient record, e.g. procedures that can be performed to treat either gastrointestinal cancers or obesity.

The less-resource intensive HRG roots within this subchapter have maximum length of stay logic to ensure that minor procedures, such as rubber band ligation of haemorrhoid, are not used to determine the HRG for a long-stay medical patient, e.g. a person who has a gastrointestinal tract bleed.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

New HRGs have been created

A new HRG, **FF43Z Minimal Anal Procedures**, has been created. This new HRG accommodates the destruction of haemorrhoid procedures, which have been remapped from HRG root **FF42 Minor Anal Procedures** to better reflect resource usage, and two new combination codes ***H568+Y41 Examination of anus*** and ***H568+Y442 Monitoring of pressure of anus***, specific to simple physiological tests, have been created.

Changes made to logic

Escalation logic has been added to specific rectal resection procedures to map to a higher expected resource HRG when a robotic approach subsidiary code is recorded. This reflects the additional resource usage associated with robotic surgery.

Logic has been added to procedure code ***G51.8 Other specified bypass of duodenum*** to escalate to HRG root **FF10 Complex Surgical Procedures for Obesity** where an additional sleeve gastrectomy is recorded. This is to identify additional resource usage associated with single-anastomosis duodeno-ileal bypass with sleeve gastrectomy (SADIS) as per NICE guidance.

Diagnosis-qualified logic has been applied to newly created combination codes ***A702+Z112 Testing of sacral nerve stimulator*** and ***A704+Z122 Neuromodulation of posterior tibial nerve for incontinence*** to ensure that, with a primary diagnosis related to faecal incontinence, this activity maps to base HRG root **FF43 Minimal Anal Procedures**. This change is expected to result in a shift in activity from Subchapters **AA Nervous System Procedures and Disorders** to this subchapter.

Incontinence logic has been removed from ***A70.4 Insertion of neurostimulator electrodes into peripheral nerve*** to reflect that there is a combination code for temporary insertion which already maps appropriately in the design to various HRGs depending on diagnosis. This code alone is used for a different, lower resource procedure, and will now default to **AB15Z Radiofrequency Ablation or Cryoablation, for Pain Management**. This change is expected to result in a shift in activity from this subchapter to Subchapter **AB Pain Management**.

Additional gynaecological related diagnoses have been added to the list **MA_Gynae_Diag** to ensure that peritoneal procedures, undertaken to treat gynaecological conditions, appropriately group to gynaecological HRGs. However, additional logic has been added to check for sex of female in addition to these diagnoses. This will result in a shift in activity from this subchapter to Subchapter **MA Female Reproductive System Procedures**.

ICD-10 code ***E34.0 Carcinoid syndrome*** has been upgraded to a value of 2 on the FDFEFFYF_CC complications and comorbidity list to reflect that this is a major CC.

Remapping of OPCS-4 codes to more appropriately reflect resource usage

Several new combination codes have been created specific to image guided biopsy of abdominal organs e.g. omentum, peritoneum. These new combination codes have been mapped to a new HRG, **YF05Z Percutaneous Biopsy of Abdominal Cavity**, within Subchapter **YF Gastrointestinal Imaging Interventions**, whereas this activity would have previously mapped to HRGs within Subchapter **FF Digestive System Open and Laparoscopic Procedures**.

A new combination code has been created, ***H412+Y763 Endoscopic peranal excision of lesion of rectum***, to identify the procedures Transanal minimally invasive surgery (TAMIS) and transanal endoscopic microsurgery (TEMS) and has been mapped to base HRG root **FF33 Distal Colon Procedures**

A new combination code ***T368+Y181 Freeing of adhesions of omentum***, has been created, and mapped to base HRG root **FF52 Intermediate Therapeutic General Abdominal Procedures**. This procedure also has gynaecological logic to map to an appropriate HRG in Subchapter **MA Female Reproductive System Procedures**, where diagnosis and sex indicate treatment of a gynaecological condition.

T29.1 Excision of umbilicus, ***T29.3 Extirpation of lesion of umbilicus*** and ***T29.5 Excision of fistula of umbilicus*** have been remapped from base HRG root **FF52 Intermediate Therapeutic General Abdominal Procedures** to **FF53 Minor Therapeutic or Diagnostic, General Abdominal Procedures** to more appropriately reflect expected resource usage.

Combination codes ***A842+Z272 Electromyography of stomach*** and ***A843+Z113 Nerve conduction studies of pudendal nerve*** have been created to identify specific low-resource nerve stimulation tests, and mapped to base HRG root **FF05 Intermediate Upper Gastrointestinal Tract Procedures, 19 years and over** and **FF36 Intermediate Large Intestine Procedures, 19 years and over**, respectively.

Combination code ***M498+Y021 Implantation of prosthesis into bladder*** has been created and mapped to base HRG root **LB15 Minor Bladder Procedures**. Logic has been added to escalate to HRG root **FF50 Complex General Abdominal Procedures**, when recorded with OPCS-4 code ***T46.2 Drainage of ascites NEC***. This is to appropriately accommodate the subcutaneous implantation of a battery-powered ascites catheter drainage system.

OPCS- 4 Unspecified (-.9) global review

Within this subchapter six ***.9 Unspecified*** codes have been remapped to lower resource HRGs, including ***G75.9 Unspecified attention to artificial opening into ileum***, which is now ignored for grouping.

OPCS-4 Paired code review

Within this subchapter 40 paired combination codes have been created to ensure the appropriate escalation of robotic procedures, where coding rules state that paired code sequencing applies.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

Within this subchapter six codes relating to abdominal wall reconstruction procedures have been mapped to the appropriate general abdominal procedure HRG roots; **FF50 Complex General Abdominal Procedures** for those involving flap reconstruction, and **FF51 Major General Abdominal Procedures** for all other procedure codes.

Additionally, ***G82.5 Radiological reduction of intussusception of ileum using air enema*** has been mapped to base HRG root **FF22 Major Small Intestine Procedures, 19 years and over**.

Subchapter GA – Hepatobiliary and Pancreatic System Open and Laparoscopic Procedures

Subchapter **GA Hepatobiliary and Pancreatic System Open Procedures** includes hepatobiliary and pancreatic system surgery for patients of all ages. It includes activity undertaken in inpatient, day case and non-admitted care settings.

It does not include endoscopic or percutaneous procedures on the hepatobiliary and pancreatic system as these map to Subchapters **GB Hepatobiliary and Pancreatic System Endoscopic and Percutaneous Procedures** and **YG Hepatobiliary and Pancreatic Imaging Interventions**, respectively.

The more general Hepatobiliary and Pancreatic HRG roots within this subchapter are divided into six levels of complexity (minor, intermediate, major, very major, complex and very complex).

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**27**	**27**
Total HRG Roots	**11**	**11**
Procedure-driven HRGs	27	27
Diagnosis-driven HRGs	0	0
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	No	No

There are also procedure-specific HRG roots for high-volume procedures such as cholecystectomy, or specialised procedures such as hepatobiliary transplants or pancreatic necrosectomy.

Multiple procedure logic is employed throughout the HRG roots within this subchapter. Escalation to an HRG root with a higher expected resource use also occurs in this subchapter, where appropriate, for patients with acute pancreatitis.

The cholecystectomy HRG root is split based on whether the surgery was open or laparoscopic and has age splits: there are several HRGs specifically for adult activity (19 years and over) and one HRG specifically for paediatric activity (18 years and under). The transplant HRG root has a paediatric age split in addition to a standard age split: there is a specific HRG for adult activity (18 years and over) and HRGs specific to the treatment of infants (0 to 1 year of age) and older children (2 to 17 years), respectively.

Interactive CC splits are employed within the majority of HRG roots within this subchapter – up to a maximum of three levels – to more appropriately differentiate expected resource usage between routine and complex patients.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Changes made to logic

ICD-10 code ***E34.0 Carcinoid syndrome*** has been added as a value of 2 to the GAGBGCYG_CC complications and comorbidity list to reflect that this is a major CC.

Remapping of OPCS-4 codes to more appropriately reflect resource usage

J21.2 Drainage of Gall Bladder and ***J33.3 Drainage of bile duct NEC*** have been remapped from base HRG root **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 thereby expected resource usage of these procedures.

Combination code ***J576+Y763 Endoscopic pancreatic necrosectomy*** has been created, and mapped to base HRG root **GA05 Very Major Open, Hepatobiliary or Pancreatic Procedures**, to appropriately differentiate the resource usage between this endoscopic procedure and its open counterpart, as per NICE guidance.

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

Within this subchapter new combination code ***J608+Y763 Endoscopic operation on pancreatic duct*** has been created and mapped to base HRG root **FE20 Therapeutic Endoscopic Upper Gastrointestinal Tract Procedures, 19 years and over**. This procedure would have previously mapped to HRGs within this subchapter.

OPCS- 4 Unspecified (-.9) global review

Within this subchapter four ***.9 Unspecified*** codes have been remapped to lower expected resource HRGs.

Subchapter GB – Hepatobiliary and Pancreatic System Endoscopic Procedures

Subchapter **GB Hepatobiliary and Pancreatic System Endoscopic Procedures** covers hepatobiliary and pancreatic system endoscopic procedures. It includes activity undertaken in inpatient, day case and non-admitted care settings for patients of all ages.

It does not include open surgical procedures, which map to Subchapter **GA Hepatobiliary and Pancreatic System Open and Laparoscopic Procedures**, or percutaneous procedures, which map to Subchapter **YG Hepatobiliary and Pancreatic Imaging Interventions**.

The HRG roots within this subchapter are split into endoscopic retrograde cholangiopancreatography (ERCP) procedures and endoscopic ultrasound procedures.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**14**	**14**
Total HRG Roots	**7**	**7**
Procedure-driven HRGs	14	14
Diagnosis-driven HRGs	0	0
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	Yes	Yes

There are three therapeutic ERCP HRG roots (intermediate, major and complex) and two diagnostic ERCP HRG roots (with biopsy or cytology and without biopsy or cytology).

Multiple procedure logic is employed throughout the HRG roots within this subchapter. Escalation to an HRG root with a higher expected resource use also occurs in this subchapter, where appropriate, for patients with acute pancreatitis.

Interactive CC splits are employed within many of the more complex HRG roots within this subchapter – up to a maximum of four levels – to more appropriately differentiate expected resource usage between routine and complex patients.

The less-resource intensive HRG roots within this subchapter have maximum length of stay logic to ensure that minor procedures, such as diagnostic ERCP, are not used to determine the HRG for a long-stay medical patient, e.g. a person who has liver failure.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Changes made to logic

ICD-10 code ***E34.0 Carcinoid syndrome*** has been added as a value of 2 to the GAGBGCYG_CC complications and comorbidity list to reflect that this is a major CC.

Remapping of OPCS-4 codes to more appropriately reflect resource usage

Combination codes ***J611+Y763 Endoscopic cystogastrotomy of pancreas*** and ***J611+Y764 Endoscopic ultrasound-guided cystogastrotomy of pancreas*** have been deleted from the design. These combination codes were mapped to base HRG root **GB09 Complex Therapeutic Endoscopic Retrograde Cholangiopancreatography**. Activity is expected to shift from this subchapter to Subchapter **GA Hepatobiliary and Pancreatic System Open Procedures** as a result of this change.

Subchapter GC – Hepatobiliary and Pancreatic System Disorders

Subchapter **GC Hepatobiliary and Pancreatic System Disorders** covers all adult liver, biliary and pancreatic system disorders. It includes activity undertaken in inpatient and day case settings.

The HRGs within this subchapter are spread across four HRG roots, two of which are disease-specific – for liver failure and non-obstructive jaundice – and two of which contain all other hepatobiliary and pancreatic system disorders – one for malignant disorders and one for non-malignant disorders.

Interactive CC splits are employed within all of the HRG roots within this subchapter – up to a maximum of four levels – to more appropriately differentiate expected resource usage between routine and complex patients.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**24**	**24**
Total HRG Roots	**4**	**4**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	24	24
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

In addition, intervention splits, including where the presence of multiple interventions influences grouping, are employed within three of the four HRG roots in this subchapter.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Changes made to logic

ICD-10 code ***E34.0 Carcinoid syndrome*** has been added as a value of 2 to the GAGBGCYG_CC complications and comorbidity list to reflect that this is a major CC.

Subchapter HC – Spinal Procedures and Disorders

Subchapter **HC Spinal Procedures and Disorders** includes spinal surgery for patients of all ages and treatment for adult spinal disorders, undertaken as inpatient, day case or outpatient activity.

The majority of percutaneous spinal procedures map to Subchapter **YH Musculoskeletal Imaging Interventions**.

The procedure-driven HRGs within this subchapter are specific to spinal reconstruction, including instrumented correction of spinal deformity. There are also extradural spinal surgery HRGs with six levels of complexity (minor, intermediate, major, very major, complex and very complex), HRGs specific to intradural spinal surgery with two levels of complexity (major and complex), and HRGs specific to diagnostic spinal puncture.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**74**	**74**
Total HRG Roots	**23**	**23**
Procedure-driven HRGs	39	39
Diagnosis-driven HRGs	35	35
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

Multiple procedure logic is employed in the majority of these procedure-driven HRGs, as are age splits: there are specific HRGs for adult activity (19 years and over) and others for paediatric activity (18 years and under). For the diagnostic spinal puncture HRGs, paediatric activity is further disaggregated into splits for young children (0 to 5 years of age) and older children (6 to 18 years of age).

Escalation to an HRG with a higher expected resource use also occurs, where appropriate, when procedures are performed bilaterally where the patient is being treated for a spinal tumour or infection or wherever there is advanced monitoring – e.g. EPR during surgery.

HRGs **HC65Z Minor Extradural Spinal Procedures** and **HC72* Diagnostic Spinal Puncture** employ maximum length of stay logic to ensure that minor procedures, such as diagnostic lumbar puncture, are not used to determine the HRG for a long-stay medical patient, e.g. a child who has meningitis.

The adult diagnosis-driven HRGs are differentiated by disorder type. In addition to interactive CCs, intervention splits are employed within the majority of these HRG roots.

Interactive CC splits are employed within the majority of both diagnosis-driven and procedure-driven HRGs within this subchapter – up to a maximum of four levels – to more appropriately differentiate expected resource usage between routine and complex patients.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Changes made to logic

New logic introduced into Subchapter **AB Pain Management** such that Treatment Function Code (***TFC) 191 Pain Management*** and ***TFC 241 Paediatric Pain Management*** are used to identify pain management procedures will see activity shifting from the diagnosis-driven HRGs in Subchapter **HC Spinal Procedures and Disorders** for admitted patients.

Remapping of codes to more appropriately reflect resource usage

OPCS-4 code ***V29.4 Primary anterior excision of cervical intervertebral disc and interbody fusion of joint of cervical spine*** has been remapped to a higher resource base HRG root, **HC63 Major Extradural Spinal Procedures**, to reflect that this code represents two procedures being undertaken concurrently, so is more resource intensive than either performed individually.

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

Within this subchapter one new combination code, ***V288+Y037 Removal of lumbar interspinous process spacer*** has been created and mapped to base HRG root **HC65 Minor Extradural Spinal Procedures** to appropriately reflect the resource usage of this procedure.

OPCS- 4 Unspecified (-.9) global review

Within this subchapter five ***.9 Unspecified*** OPCS-4 codes and five combination codes containing a ***.9 Unspecified*** code have been remapped to lower expected resource HRGs. This includes the deletion of two combination codes, ***V289+V552 Unspecified insertion of lumbar interspinous process spacer, with two levels of spine*** and ***V289+V553 Unspecified insertion of lumbar interspinous process spacer, with greater than two levels of spine***, as it is inappropriate for these unspecified codes to escalate in this manner.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

Within this subchapter four new codes have been authored relating to spinal growing system procedures (***V41.5 Posterior attachment of spinal growing system***, ***V41.6 Attention to spinal growing system*** and ***V41.7 Surgical distraction of spinal growing system***) and ***V51.1 Primary direct lateral excision of lumbar intervertebral disc and interbody fusion of joint of lumbar spine***. This includes the creation of new combination codes for these new OPCS-4 codes in combination with ***V55.2 Two levels of spine*** and/or ***V55.3 Greater than two levels of spine***. These new OPCS-4.8 and associated combination codes have been mapped to the spinal reconstruction and extradural spinal procedure HRGs according to expected resource usage.

Subchapter HD – Musculoskeletal and Rheumatological Disorders

Subchapter **HD Musculoskeletal and Rheumatological Disorders** covers musculoskeletal and rheumatological disorders for adult patients. It includes activity undertaken in an inpatient and day case setting.

The HRGs within this subchapter are differentiated by disorder type.

Interactive CC splits are employed within all of the HRGs within this subchapter – up to a maximum of six levels – to more appropriately differentiate expected resource usage between routine and complex patients.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**35**	**35**
Total HRG Roots	**7**	**7**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	35	35
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter HE – Orthopaedic Disorders

Subchapter **HE Orthopaedic Disorders** covers trauma and non-trauma orthopaedic diagnoses for adult patients only. It includes activity undertaken in inpatient and day case settings.

Adult spinal disorder HRGs can be found in Subchapter **HC Spinal Procedures and Disorders**.

Adult rheumatological and other musculoskeletal disorders can be found in Subchapter **HD Musculoskeletal and Rheumatological Disorders**.

There are HRGs for injuries, based on the site of the injury, which are split into fractures and other injuries. There are also HRGs specific to complications of trauma and orthopaedic treatment.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	84	84
Total HRG Roots	15	15
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	84	84
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Interactive CC splits are employed within all of the HRG roots within this subchapter – up to a maximum of five levels – to more appropriately differentiate expected resource usage between routine and complex patients.

In addition, intervention splits, including multiple interventions, are also employed within the majority of HRG roots.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter HN – Orthopaedic Non-Trauma Procedures

Subchapter **HN Orthopaedic Non-Trauma Procedures** covers non-trauma orthopaedic procedures for patients of all ages. It includes activity undertaken in inpatient, day case and non-admitted care settings.

Trauma procedure activity can be found in Subchapter **HT Orthopaedic Trauma Procedures**.

Spinal activity can be found in Subchapter **HC Spinal Procedures and Disorders**.

Adult orthopaedic disorders can be found in Subchapter **HE Orthopaedic Disorders**.

Adult musculoskeletal and rheumatological disorders can be found in Subchapter **HD Musculoskeletal and Rheumatological Disorders**.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**111**	**111**
Total HRG Roots	**36**	**36**
Procedure-driven HRGs	111	111
Diagnosis-driven HRGs	0	0
Age Splits	Yes	Yes
Complications and Comorbidities Splits	No	No
Intervention Splits	Yes	Yes
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

Subchapter HN does not include percutaneous spinal procedures, with the exception of OPCS-4 code **W35.5 Therapeutic percutaneous puncture of bone.** The remainder map to Subchapter **YH Musculoskeletal Imaging Interventions**.

The orthopaedic procedures for non-trauma HRGs have separation of HRGs based on the site of surgery – e.g. hip, knee, hand etc. – and are split into seven levels of complexity (minimal, minor, intermediate, major, very major, complex and very complex), with some sites combined at the higher complexity level.

Multiple site codes

Where multiple site codes are recorded relating to the same dominant procedure, the sequencing of sites per the following site hierarchy is applied when grouping activity:

Spine > Hip > Knee > Shoulder > Elbow > Hand > Foot

Therefore if **A59.2 Total sacrifice of peripheral nerve NEC** had subsequent site codes of **Z095 Posterior interosseous nerve (ELBOW)** and **Z09.2 Median nerve (HAND)**, the combination code **A59.2+ELBOW** would be derived and drive the grouping.

Harvest OPCS-4 codes

There is specific coding guidance regarding the coding of harvest OPCS-4 codes (**Y54.-** to **Y69.-**), in particular in relation to orthopaedic operations – see PGCS11, which states that coding should reflect the following: procedure, procedure site, procedure laterality, harvest, harvest site, harvest laterality.

In certain circumstances, where there are harvest OPCS-4 codes in the activity, the Grouper logic will look at all of the site and approach codes following the dominant procedure code.

This means that where there is a hierarchy of site, i.e. hip > knee > shoulder > elbow > hand > foot, the site of harvest may determine the HRG. For example, if an arthroplasty of the hand with a harvest of tendon from the hip is undertaken, this will map to a hip HRG in the current HRG design.

In the previous subchapter **HB Orthopaedic Non-Trauma Procedures**, procedure escalation was dealt with as a separate process ("Core3"). This has now been removed as, with the removal of primary diagnosis to check for anatomical site logic, it is no longer required, and "escalation" to a higher expected resource HRG can be achieved through typical multiple procedure logic, using the new combination codes.

In addition to logic that "escalates" activity to higher expected resource HRGs, if the procedure is performed bilaterally, logic has been added to "escalate" procedures that have been performed on multiple digits, e.g. fingers of the hand, to reflect the additional resource usage of performing multiple operations in a single theatre instance. With regard to the general HRG **HB99Z Other Procedures for Non-Trauma**, which contained activity that failed to specify an anatomical region or had a different anatomical region, this HRG has been removed and replaced, in part, with **HN93Z Other Muscle, Tendon, Fascia or Ligament Procedures**.

Previously, where there was a primary diagnosis indicating malignancy or trauma, the activity mapped into subchapter **HA Orthopaedic Trauma Procedures**. This has been changed such that malignancy activity will map to the HRGs within this subchapter, and "escalate" to a higher expected resource HRG to reflect the additional complexity associated with cancer surgery.

To reflect the clinical care and high costs associated with the treatment of infected internal orthopaedic prosthetics, HRG roots **HN80 Very Complex, Hip or Knee Procedures for Non-Trauma** and **HN85 Very Complex, Foot, Hand, Shoulder or Elbow Procedures for Non-Trauma** have been created. These HRGs can only be derived for specific revisional and end-stage limb salvage procedures, where there is a diagnosis code indicating infected internal orthopaedic prosthetics.

Multiple procedure logic is employed throughout the HRGs within this subchapter, as are age splits: there are specific HRGs for adult activity (19 years and over) and others for paediatric activity (18 years and under). There are now also HRGs specific to the treatment of young children (0 to 5 years of age) and those for older children (6 to 18 years). Escalation to an HRG with a higher expected resource use also occurs, where appropriate, when procedures are performed bilaterally (or on multiple digits of hands or feet), or where the patient is being treated for bone malignancy or an infected orthopaedic prosthesis.

All the minor and minimal procedure HRGs within this subchapter have maximum length of stay logic to ensure that minor procedures, such as joint injections, are not used to determine the HRG for a long-stay medical patient, e.g. a person who has bone cancer.

Interactive CC splits are employed within the majority of HRG roots within this subchapter – up to a maximum of six levels – to more appropriately differentiate expected resource usage between routine and complex patients.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Changes made to logic

OPCS-4 site code ***Z58.4 Tibialis anterior*** has been removed from the knee orthopaedic site list and moved to the foot list, to reflect that this is a site associated with the foot and ankle rather than knee and lower limb.

Remapping of codes to more appropriately reflect resource usage

A new combination code ***W621+Y769+Z841 Primary arthrodesis and internal fixation of sacroiliac joint using minimal access approach*** has been created, according to NICE guidance, to ensure that this specific procedure can be mapped to the appropriate resource base HRG root, **HN14 Intermediate Hip Procedures for Non-Trauma**, to reflect the lower cost of this minimal access procedure.

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

Within this subchapter 49 new combination codes have been created to identify injection of therapeutic substance into fascia, irrigation and debridement of tendon, and ligament procedures. This includes orthopaedic site-specific combination codes. These new combination codes have been mapped to the appropriate resource site-specific HRGs, the Minimal HRGs for the injection procedures, which also include pain management logic, and Intermediate HRGs for the debridement and irrigation procedures.

OPCS- 4 Unspecified (-.9) global review

Within this subchapter 11 ***.9 Unspecified*** OPCS-4 codes and 36 associated site-specific combination codes containing a ***.9 Unspecified*** code have been remapped to lower resource HRGs, many as a result of the remapping of the related ***.8 Other specified*** codes.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

Within this subchapter three new codes have been authored. ***O17.6 Remanipulation of fracture of bone and fixation using plate*** and ***W24.7 Closed reduction of fracture of bone and fixation using plate*** have been ignored for grouping but combination codes have been created for each orthopaedic site e.g. ***O176+HIP Remanipulation of fracture of bone and fixation of hip using plate*** and then mapped to the appropriate Intermediate and Major resource site-specific HRGs, respectively. ***W92.6 Chemical synovectomy*** has been mapped to base HRG root **HN93 Other Muscle, Tendon, Fascia or Ligament Procedures** as a base HRG root but combination codes have been created for each orthopaedic site (excluding rib) and then mapped to the appropriate resource Minimal site-specific HRG.

Subchapter HT – Orthopaedic Trauma Procedures

Subchapter **HT Orthopaedic Trauma Procedures** covers trauma orthopaedic procedures for patients of all ages. It includes activity undertaken in inpatient, day case and non-admitted care settings.

Non-trauma procedure activity can be found in Subchapter **HN Orthopaedic Non-Trauma Procedures**.

Spinal activity can be found in Subchapter **HC Spinal Procedures and Disorders**.

Adult orthopaedic disorders can be found in Subchapter **HE Orthopaedic Disorders**.

Adult musculoskeletal and rheumatological disorders can be found in Subchapter **HD Musculoskeletal and Rheumatological Disorders**.

Subchapter HT does not include percutaneous spinal procedures, with the exception of OPCS-4 code **W35.5 Therapeutic percutaneous puncture of bone.** The remainder map to Subchapter **YH Musculoskeletal Imaging Interventions**.

Composition and Concepts		
	RC17/18	**RC16/17**
Total HRGs	**87**	**87**
Total HRG Roots	**26**	**26**
Procedure-driven HRGs	87	87
Diagnosis-driven HRGs	0	0
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

The orthopaedic procedures for trauma HRGs are based on the site of surgery – e.g. hip, knee, hand etc. – and are now split into five levels of complexity (minor, intermediate, major, very major and complex), with some sites combined at the higher complexity level.

Multiple site codes

Where multiple site codes are recorded relating to the same dominant procedure, the sequencing of sites per the following site hierarchy is applied when grouping activity:

Spine > Hip > Knee > Shoulder > Elbow > Hand > Foot

Therefore if **A59.2 Total sacrifice of peripheral nerve NEC** had subsequent site codes of **Z09.5 Posterior interosseous nerve (ELBOW)** and **Z09.2 Median nerve (HAND)**, the combination code **A59.2+ELBOW** would be derived and drive the grouping.

Harvest OPCS-4 codes

There is specific coding guidance regarding the coding of harvest OPCS-4 codes (Y54-Y69), in particular in relation to orthopaedic operations – see PGCS11, which states that coding should reflect the following: procedure, procedure site, procedure laterality, harvest, harvest site, harvest laterality.

In certain circumstances, where there are harvest OPCS-4 codes in the activity, the Grouper logic will look at all of the site and approach codes following the dominant procedure code.

This means that where there is a hierarchy of site i.e. hip > knee > shoulder > elbow > hand > foot, the site of harvest may determine the HRG. For example, if an arthroplasty of the hand with a harvest of tendon from the hip is undertaken, this will map to a hip HRG in the current HRG design.

In subchapter **HA Orthopaedic Trauma Procedures**, procedure escalation was dealt with as a separate process ("Core3"). This has now been removed as, with the removal of primary diagnosis to check for anatomical site logic, it is no longer required. "Escalation" to higher expected resource HRGs is achieved through typical multiple procedure logic, using the new combination codes.

In addition to logic that "escalates" activity to higher expected resource HRGs, if the procedure is performed bilaterally, logic has been added to "escalate" procedures that have been performed on multiple digits e.g. fingers of the hand, to reflect the additional resource usage of performing multiple operations.

The general HRG, **HA99Z Other Procedures for Trauma**, which contained activity that didn't specify an anatomical region, or had a different anatomical region, has been removed in the new design and replaced, in part, with **HN93Z Other Muscle, Tendon, Fascia or Ligament Procedures**.

Previously, where there was a primary diagnosis indicating malignancy or trauma, the activity mapped into subchapter **HA Orthopaedic Trauma Procedures**. This has been changed in the new design and instead the bone malignancy activity maps to the HRGs within subchapter **HN Orthopaedic Non-Trauma Procedures**, "escalating" to a higher expected resource HRG to reflect the additional complexity associated with undertaking procedures for bone cancer.

Multiple procedure logic is employed throughout the HRGs within this subchapter, as are age splits: there are specific HRGs for adult activity (19 years and over) and others for paediatric activity (18 years and under). There are now also HRGs specific to the treatment of young children (0 to 5 years of age) and those for older children (6 to 18 years). Escalation to an HRG with a higher expected resource use also occurs in this subchapter, where appropriate, when procedures are performed bilaterally (or on multiple digits of hands or feet), or where the patient is being treated for bone malignancy.

All the minor procedure HRGs within this subchapter have maximum length of stay logic to ensure that minor procedures, such as the application of traction, are not used to determine the HRG for a long-stay medical patient, e.g. a person who has suffered a fractured hip.

Interactive CC splits are employed within the majority of HRG roots within this subchapter – up to a maximum of five levels – to more appropriately differentiate expected resource usage between routine and complex patients.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Changes made to logic

OPCS-4 site code ***Z58.4 Tibialis anterior*** has been removed from the knee orthopaedic site list and moved to the foot list, to reflect that this is a site associated with the foot and ankle rather than knee and lower limb.

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

Within this subchapter 42 new combination codes have been created to identify irrigation and debridement of tendon and ligament procedures. This includes orthopaedic site-specific combination codes. These new combination codes have been mapped to the appropriate resource site-specific Intermediate HRGs.

OPCS- 4 Unspecified (-.9) global review

Within this subchapter 11 ***.9 Unspecified*** OPCS-4 codes and 36 associated site-specific combination codes containing a ***.9 Unspecified*** code have been remapped to lower expected resource HRGs, many as a result of the remapping of the related ***.8 Other specified*** codes.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

Within this subchapter two new codes have been mapped where there is a primary diagnosis of trauma. ***O17.6 Remanipulation of fracture of bone and fixation using plate*** and ***W24.7 Closed reduction of fracture of bone and fixation using plate*** are ignored for grouping but combination codes have been created for each orthopaedic site e.g. ***O176+HIP Remanipulation of fracture of bone and fixation of hip using plate*** and then mapped to the appropriate Intermediate and Major resource site-specific HRGs, respectively.

Subchapter JA – Breast Procedures and Disorders

Subchapter **JA Breast Procedures and Disorders** covers breast procedures for patients of all ages and adult breast disorders. It includes activity undertaken in inpatient, day case and non-admitted care settings.

It does not include percutaneous breast imaging intervention procedures; these map to Subchapter **YJ Breast Imaging Interventions**.

The breast procedure HRGs within this subchapter are split based on three levels of complexity (minor, intermediate and major). In addition, there are HRGs specific to breast surgery with lymph node clearance and therapeutic mammoplasty.

There are also HRGs specific to reconstructive surgery that are split based on the type of reconstruction employed, and whether the surgery is performed immediately or at a later date.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**35**	**35**
Total HRG Roots	**20**	**20**
Procedure-driven HRGs	24	24
Diagnosis-driven HRGs	11	11
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

All the procedure-driven HRGs are also split into unilateral and bilateral HRGs – the latter can include either the identical procedure performed on both breasts i.e. bilateral reduction mammoplasty or procedures of the equivalent resource usage being performed on both breasts i.e. lumpectomy of left breast with oncoplasty of right breast.

Multiple procedure logic is employed throughout the majority of HRGs within this subchapter.

All the minor procedure HRGs within this subchapter have maximum length of stay logic to ensure that minor procedures, such as injection into breast, are not used to determine the HRG for a long-stay medical patient, e.g. a person who has breast cancer.

The diagnosis-driven HRGs for adult breast disorders are split based on whether the disorder is malignant or non-malignant.

Interactive CC splits, up to a maximum of five levels, are employed within the majority of both diagnosis-driven and procedure-driven HRGs to more appropriately differentiate expected resource usage between routine and complex patients. Intervention splits are also employed in both of the diagnosis-driven HRG roots.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

OPCS- 4 Unspecified (-.9) global review

Within this subchapter, ***B36.9 Unspecified reconstruction of nipple and areola*** has been remapped from base HRG root **JA43 Unilateral Intermediate Breast Procedures** to **JA45 Unilateral Minor Breast Procedures** to match the mapping of the equivalent .4 code within the rubric.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

Within this subchapter two new codes have been authored. ***B41.1 Radionuclide guided excision of lesion of breast*** has been mapped to base HRG root **JA43 Unilateral Intermediate Breast Procedures** and ***B41.2 Radionuclide guided partial excision of breast*** has been mapped to base HRG root **JA20 Unilateral Major Breast Procedures** to appropriately reflect expected resource usage.

Subchapter JB – Burns Procedures and Disorders

Subchapter **JB Burns Procedures and Disorders** covers all aspects of burns care for both adults and children. It includes activity undertaken in inpatient, day case and non-admitted care settings.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	38	38
Total HRG Roots	23	23
Procedure-driven HRGs	4	4
Diagnosis-driven HRGs	34	34
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	Yes	Yes
Procedure Combination Codes	No	No
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

The majority of HRGs within this subchapter are differentiated by the severity score of the burn, based on a combination of factors such as the total body surface area (TBSA) affected, the degree of burn, the location of burn, inhalation injury, patient age and complications and comorbidities. These HRGs are further differentiated by the number and type of intervention recorded in the form of an intervention score.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) for burns care groups to an HRG within Subchapter **JB Burns Procedures and Disorders**, rather than an HRG in **Chapter P Diseases of Childhood and Neonates**. This is an exception to the requirements of the Casemix Design Framework, on clinical advisement.

The design incorporates new Core 7 (Burns) logic which is required to ensure that patients with a 2nd or 3rd degree burn diagnosis code, in any position, map to a burns HRG, irrespective of procedure recorded.

Records with a primary diagnosis of a 1st degree burn, unspecified degree burn, burn of respiratory or genitourinary tract (which are classed as equivalent to a 2nd/3rd degree burn for the purpose of the HRG design, but as internal burns do not require TBSA to be recorded) will only map to a burns HRG where no significant procedure is recorded.

However, records with a dominant procedure specific to the treatment of burns (OPCS-4 rubrics **S54.-** and **S55.-**) will also map to a burns HRG. There are also procedure-specific HRGs for the treatment of burns – debridement, and cleansing and dressing, where the activity does not map to the severity category HRGs i.e. in an outpatient setting, where diagnosis is not recorded.

With the exception of internal burns, the absence of a diagnosis code indicating TBSA of burn will generate the U group HRG, **UZ01Z Data Invalid for Grouping** – as it is mandatory to code this information in the record – and this is required to appropriately determine resource usage.

There are specific HRGs for unspecified degree of burns, split adult (16 years and over) and child (15 years and under) as clinically appropriate. It is hoped that the activity reported against these HRGs will reduce over time as more appropriate coding of the severity of burn is captured.

There are also specific HRGs for patients receiving treatment for 2nd or 3rd degree burns that are either transferred out from a provider or die within 2 days or less, to reflect that the resources associated with these patients is very different to those patients undergoing long-term treatment, often for very severe burns.

All other treatment of burns will map to one of the different levels of severity category HRGs, which are also split by age (adult/child) and/or intervention score e.g. skin grafts.

In order to simplify the design, dummy HRG roots are used to map records via Core 7 (Burns) logic for 2nd and 3rd degree burns, or via Core 1 (standard) logic for 1st degree and internal burns to a base severity category HRG root as below:

- **JB89 Treatment of Burn, with Severity Score 1** – Enables direct mapping to JB49 and JB58
- **JB90 Treatment of Burn, with Severity Score 2** – Enables direct mapping to JB48 and JB57 (For First Degree Burns)
- **JB91 Treatment of Burn, with Severity Score 2** – Enables direct mapping to JB48, JB55 and JB57 (For Second and Third Degree Burns)
- **JB92 Treatment of Burn, with Severity Score 3** – Enables direct mapping to JB47, JB55 and JB56
- **JB93 Treatment of Burn, with Severity Score 4** – Enables direct mapping to JB46, JB52 and JB54
- **JB94 Treatment of Burn, with Severity Score 5** – Enables direct mapping to JB43, JB45, JB52 and JB53
- **JB95 Treatment of Burn, with Severity Score 6** – Enables direct mapping to JB43, JB44 and JB51
- **JB96 Treatment of Burn, with Severity Score 7** – Enables direct mapping to JB42 and JB51
- **JB97 Treatment of Burn, with Severity Score 8-9** – Enables direct mapping to JB41 and JB50
- **JB98 Treatment of Burn, with Severity Score 10+** – Enables direct mapping to JB40 and JB50

For 2nd or 3rd degree burns (external burns only), grouped via Core 7 (Burns) logic, Core 3 “escalation” logic is then used to determine the final severity category dummy HRG root, and then the final HRG is determined using age and intervention criteria.

The base severity category HRG is determined by a combination of the depth of the burn i.e. degree, and the TBSA.

The TBSA diagnosis codes are in bands representing 10% TBSA e.g. **T31.0 Burns involving less than 10% of body surface**, **T31.1 Burns involving 10-19% of body surface**. However, there is a significant resource difference between a patient with a burn of 1% TBSA compared to 9% TBSA.

Therefore, for patients with a TBSA of <20%, a proxy measure of calculating TBSA has been devised using the average % TBSA burned of each region of the body as shown in the table below:

Body Site (as per ICD-10 codes)	Proxy % TBSA (where <10% TBSA overall)	Proxy % TBSA (where <20% TBSA overall)
Head and Neck	1.5	3
Trunk	3	9
Upper Limb	1	2
Hand and Wrist	1	2
Lower Limb	2	4
Foot and Ankle	2	4
Multiple Areas	3	9
Unspecified Area	1	2

If, for example, a patient has TBSA <10% recorded and they have a diagnosis code of a burn of hand this has a proxy TBSA of 1%, whereas a burn of trunk has a proxy TBSA of 3%. If a patient has both then the total proxy TBSA is 4%. Likewise if a patient has a TBSA of 10-19% code recorded and they have a diagnosis code of burn of head, trunk and foot their proxy TBSA would be 16%.

Note that only unique burns diagnosis codes (including primary diagnosis) contribute to proxy TBSA scoring, e.g. a primary and secondary diagnosis of **T20.2 Burn of second degree of head and neck** will only count as 1 area when determining proxy TBSA.

For information, in order for this to be implemented in the design database – each of these values have been multiplied by a value of 10 i.e. Head and Neck value of 1.5 becomes 15 – therefore the check at flag level for 1-4% TBSA proxy will check for a minimum value of 15, and for 15-19% TBSA will check for a minimum value of 150.

This then enables differentiation of resources between patients with <1% (the 1% proxy TBSA are assumed to be <1% for the HRG derivation), 1-4% (which would actually start at 1.5%), 5-9%, 10-14% and 15-19% TBSA. Therefore, records which map to a burns HRG will map to the following base severity category HRG roots:

% TBSA / Degree of burn	Start Severity Category
1st degree <20%	1
1st degree >20%, or 2nd/3rd degree <1%	2
2nd/3rd degree 1-4%	3
2nd/3rd degree 5-9%	4
2nd/3rd degree 10-14%	5
2nd/3rd degree 15-19%	6
2nd/3rd degree 20-29%	7
2nd/3rd degree 30-39%	8
2nd/3rd degree 40%+	9

Escalation to a higher severity category HRG – up to a maximum of 1 severity category for 1st degree burns (enabled via Core 1 standard grouping logic) and 3 severity categories for 2nd / 3rd degree burns (enabled via Core 3 escalation logic) will then take place depending on other relevant information such as age, complications and comorbidities (CC), burns to face, hands or feet – i.e. burns which are more resource intensive due to location i.e. inability to walk, feed themselves etc, and whether patient has an inhalation injury or combination thereof.

Escalation can occur up the severity categories depending on the complicating factor as outlined in the table below:

Complicating factor	No escalation	Up 1 Severity Category	Up 2 Severity Categories	Up 3 Severity Categories
Age	<60	60-79	80 or above	-
CC Score	<3	3-5	6-8	9+
Burn involving face, hands or feet	0 or 1 of these areas	2 of these areas e.g. face and hand	3 of these areas e.g. face, hands and feet	-
Inhalation Injury requiring invasive ventilation	-	-	-	Yes

Note that only unique burns diagnosis codes (including primary diagnosis) contribute to severity escalation logic, e.g. a primary and secondary diagnosis of **T20.2 Burn of second degree of head and neck** will only count as 1 area when determining severity escalation.

Patients may qualify for a combination of these factors but for 1st degree burns the maximum escalation will be up 1 severity category – from JB89 Severity Category 1 to JB90 Severity Category 2, via Core 1 standard logic.

For 2nd and 3rd degree burns the maximum escalation will be up 3 severity categories e.g. from JB92 Severity Category 3 to JB95 Severity Category 6, via Core 3 escalation logic

For example, if a record derives a base JB91 Severity Category 2 dummy HRG root (from Core 7 or Core 1 logic) has age of 65 years old, burns of face and feet and also unique secondary diagnoses that sum to a CC score of 3, then as each of these complicating factors would escalate the patient up one severity category level, the combination of these factors escalates up 3 severity categories to a JB94 Severity Category 5 dummy HRG root.

If a record derives a base JB93 Severity Category 4 dummy HRG root, has an age of 85 years old, unique secondary diagnoses that sum to a CC score of 7 and has an inhalation injury requiring invasive ventilation then, although these complicating factors combined would count to an escalation value of 7, noting that the maximum escalation is 3 severity categories, escalation would occur to JB96 Severity Category 7 dummy HRG root.

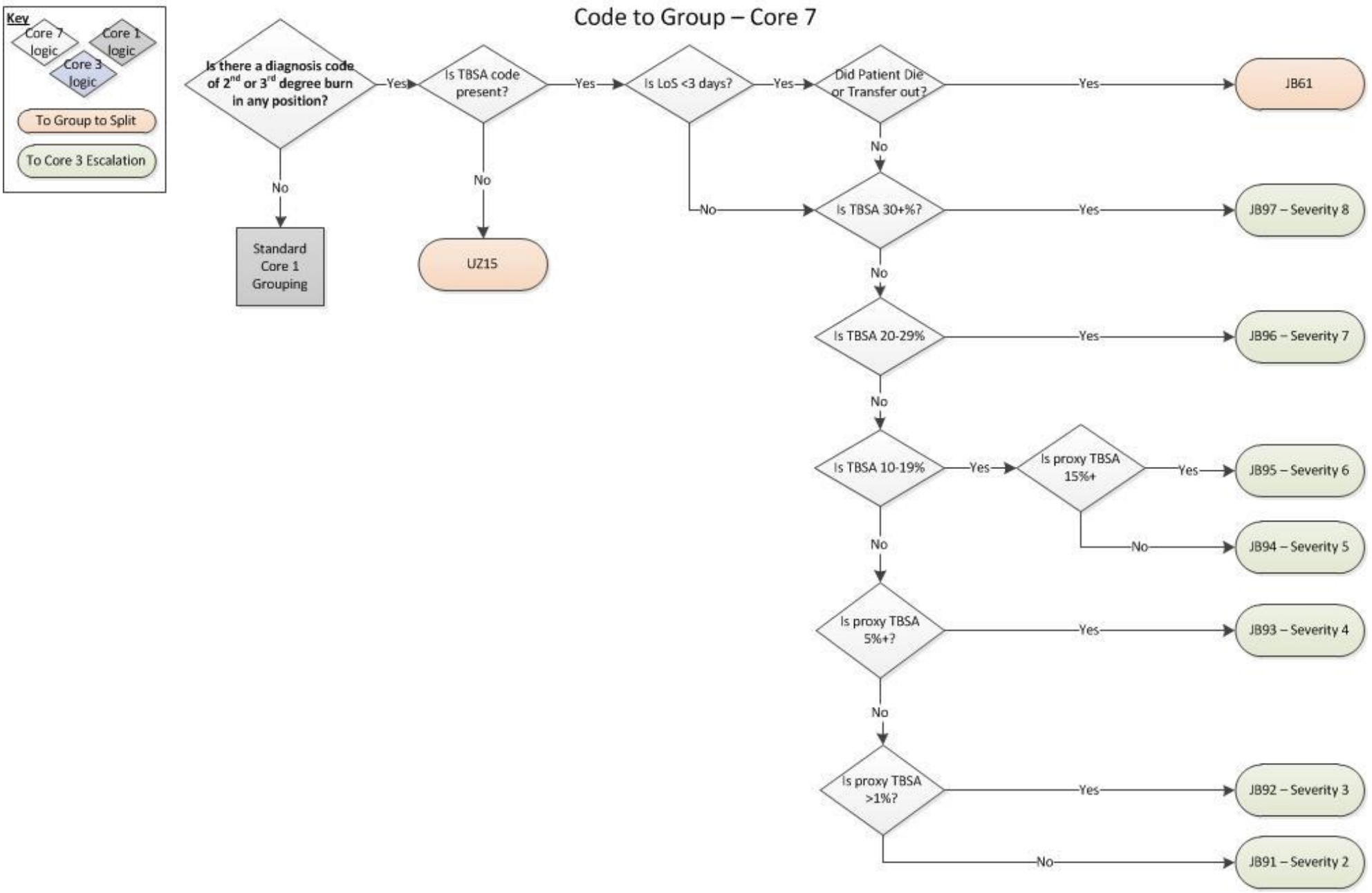
As the maximum severity category HRG is 8+ for children and 10+ for adults, patients cannot escalate beyond these HRGs.

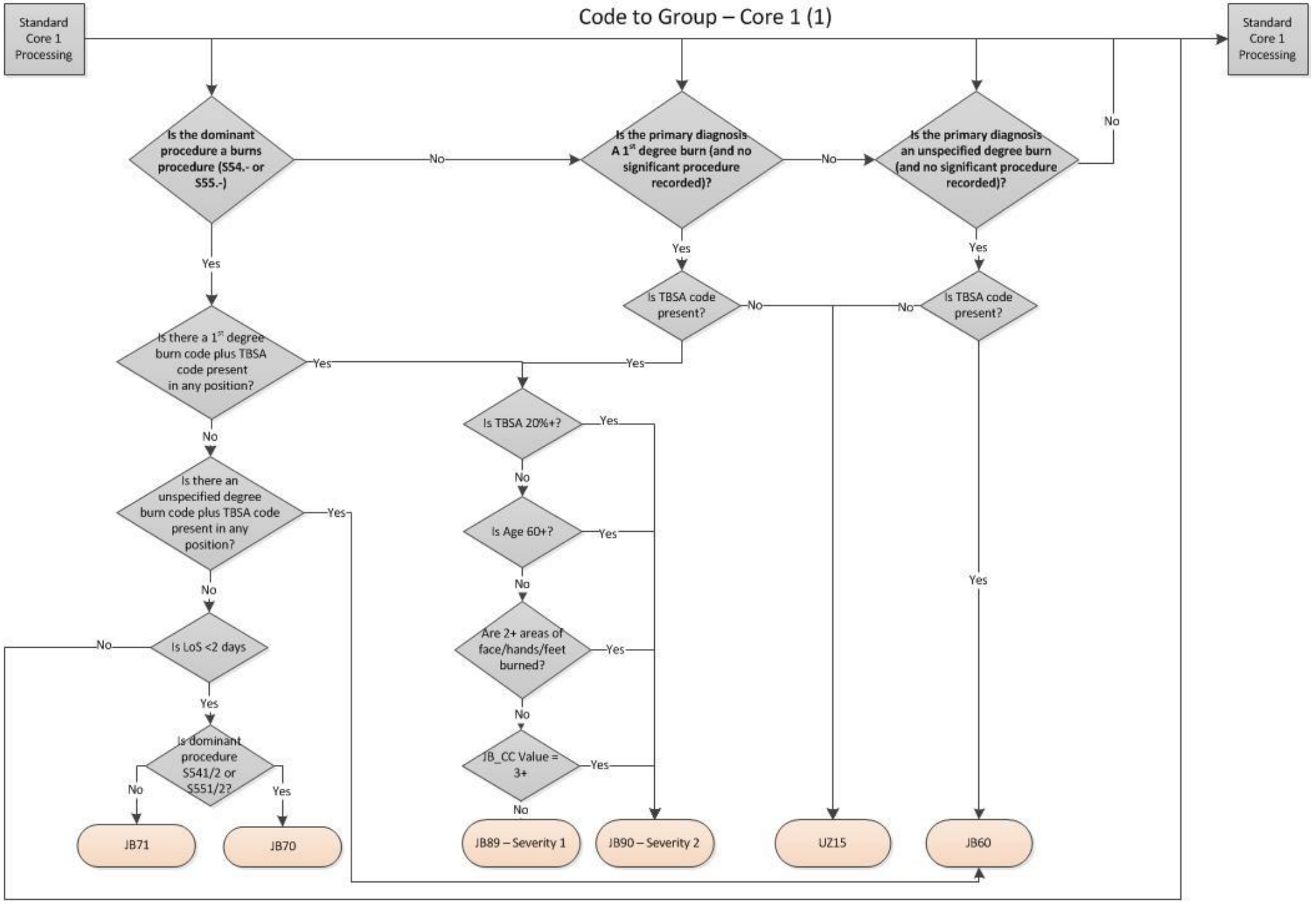
The actual HRG is then derived using patient age (adult – >15 years / child <16 years) and intervention score.

Interventions scores are either 0 – no significant burns related intervention, 1 – a major burn intervention (e.g. skin graft) or 2 – a complex burn intervention (e.g. amputation of limb). Therefore, an intervention score of 2 can be one complex procedure or 2 major procedures.

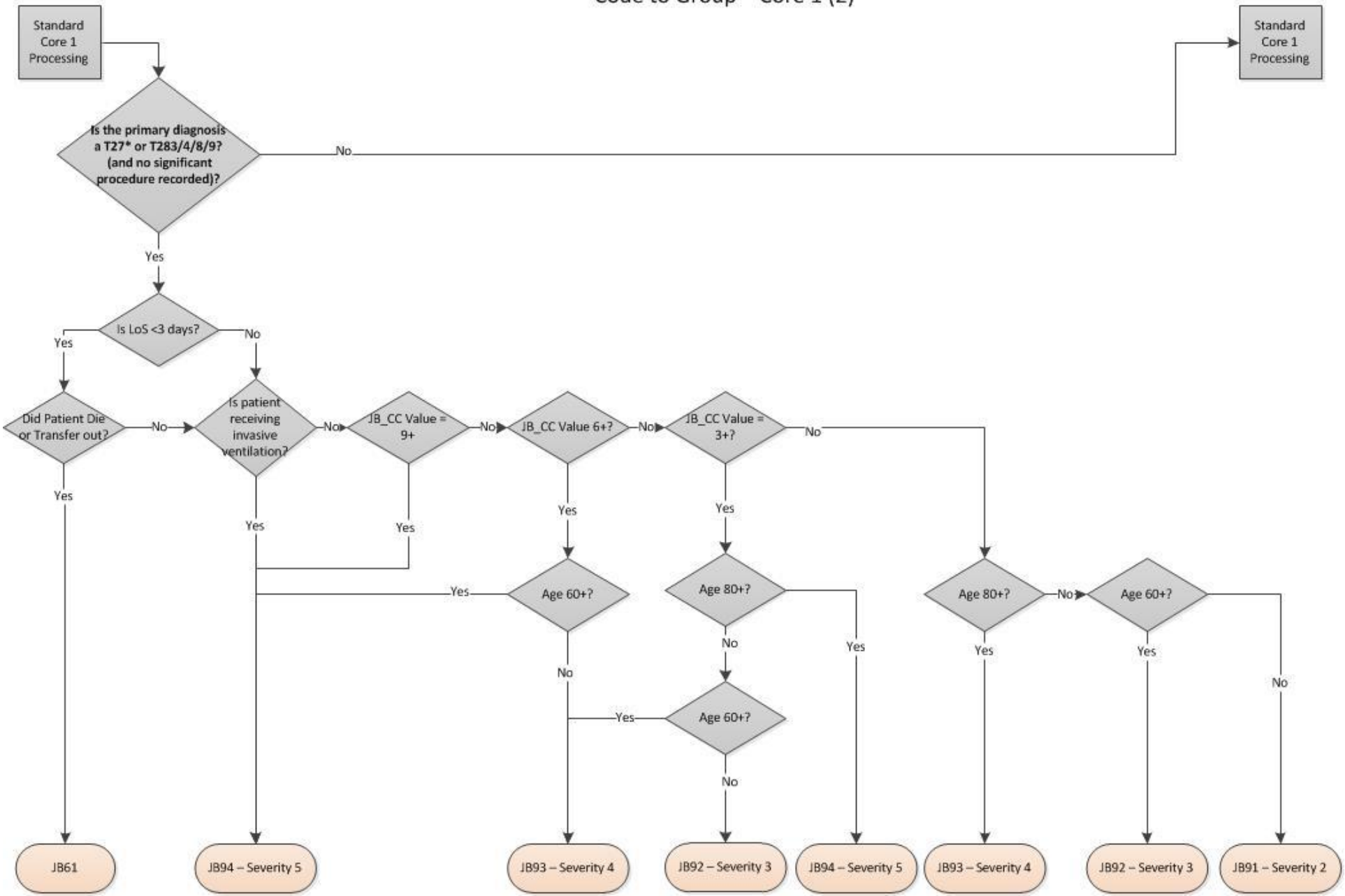
Below is a flow diagram that shows how the new burns HRGs can be generated as explained above, either using Core 7 (Burns) logic or Core 1 (standard) logic to determine whether the activity should generate a burns HRG, and if so what specific HRG or base severity category dummy HRG based on degree of burn and TBSA. Where appropriate, Core 3 and standard escalation logic is then used to determine the appropriate severity category of the dummy HRG root.

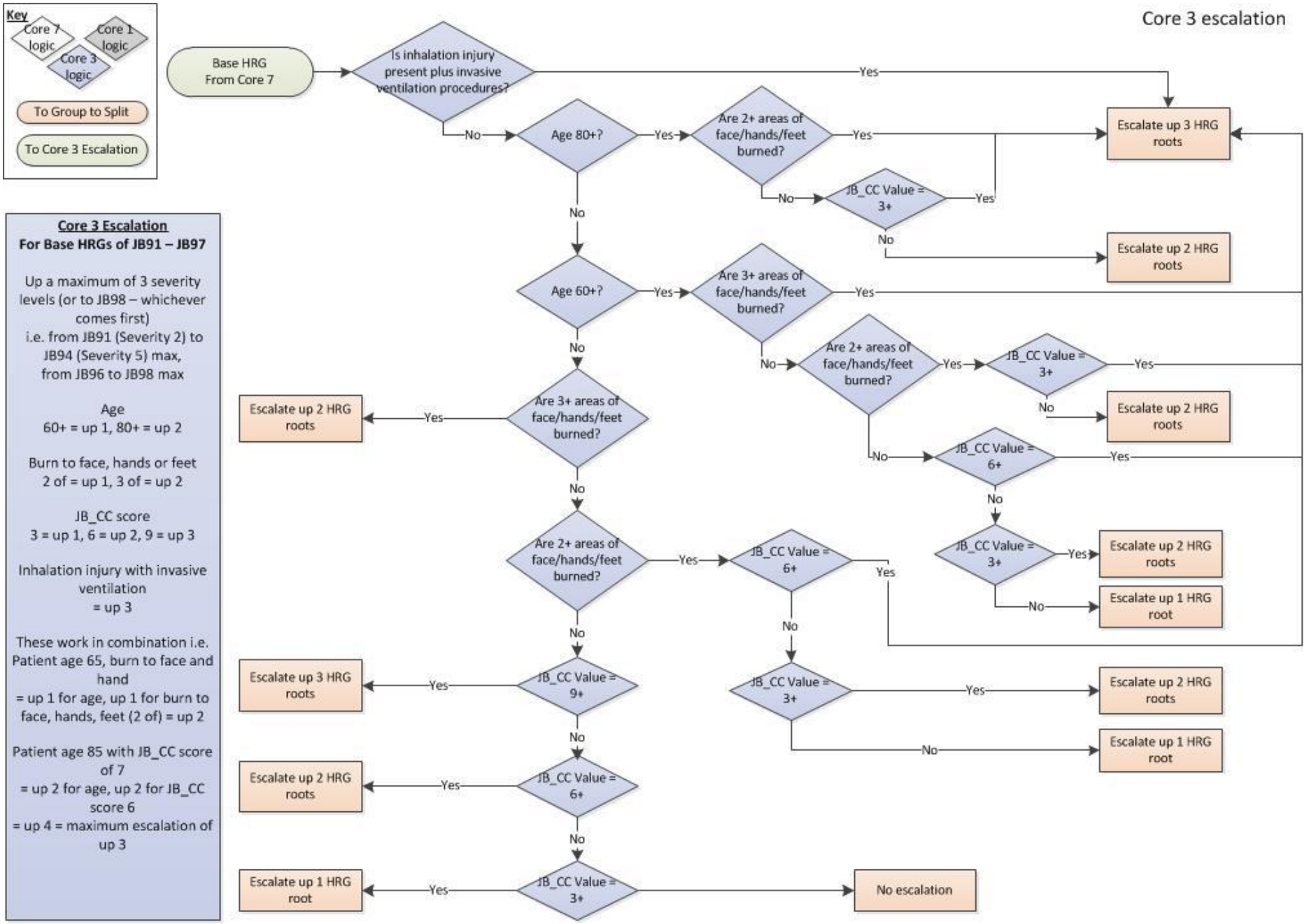
From the dummy HRG root, group to split logic as (identified in the Group to Split tab in the Excel Code to Group workbook) is used to determine the mapping of these dummy HRG roots to final HRGs based on the patient's age and intervention score.

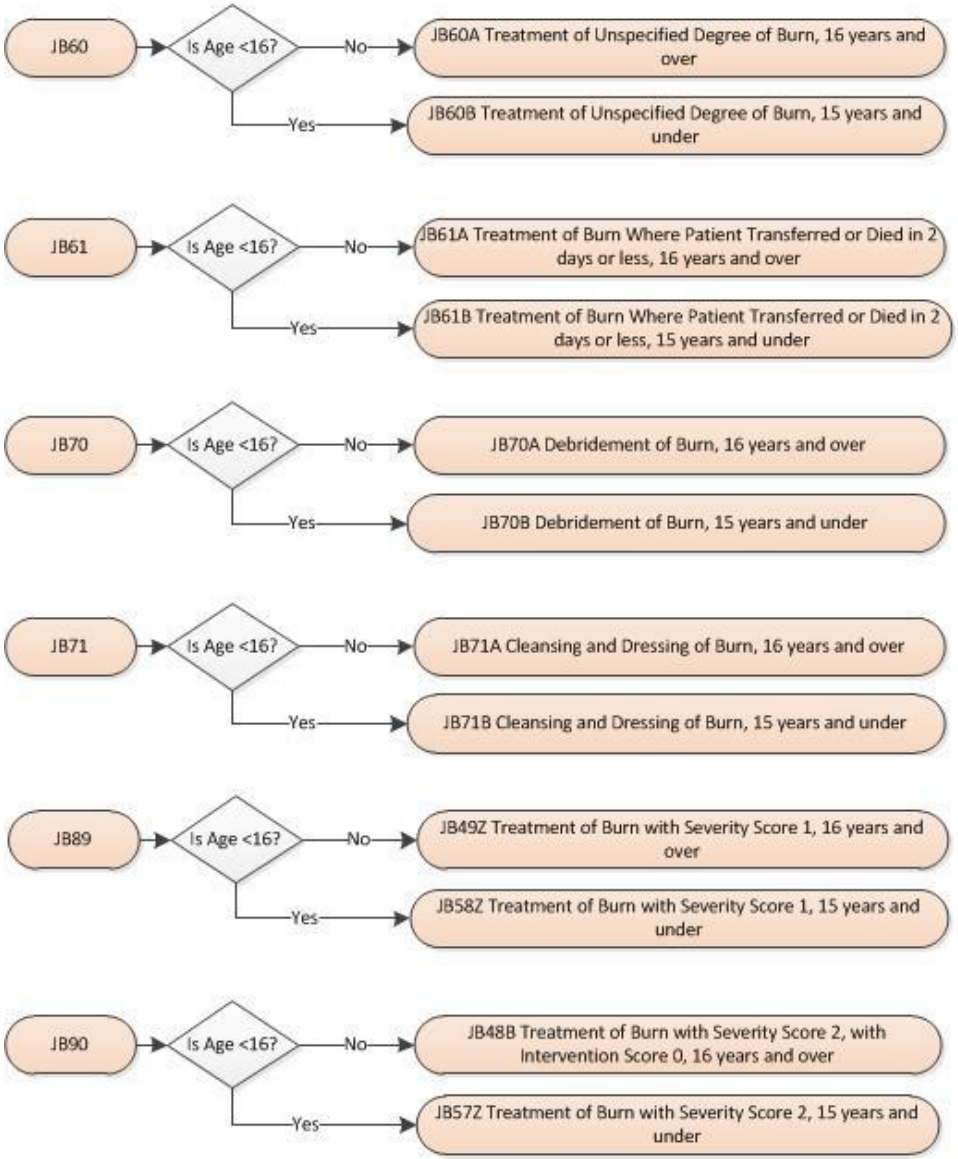


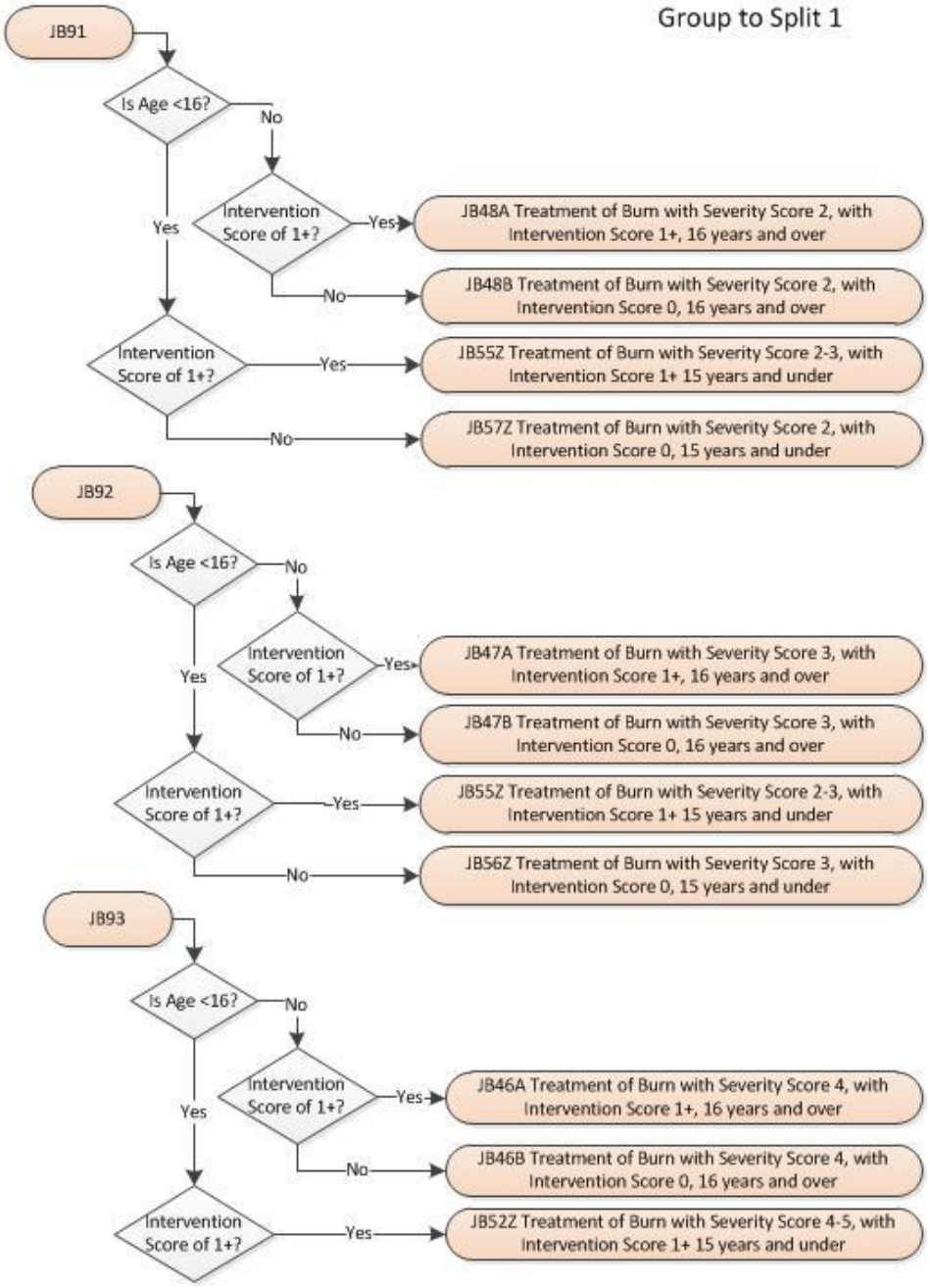


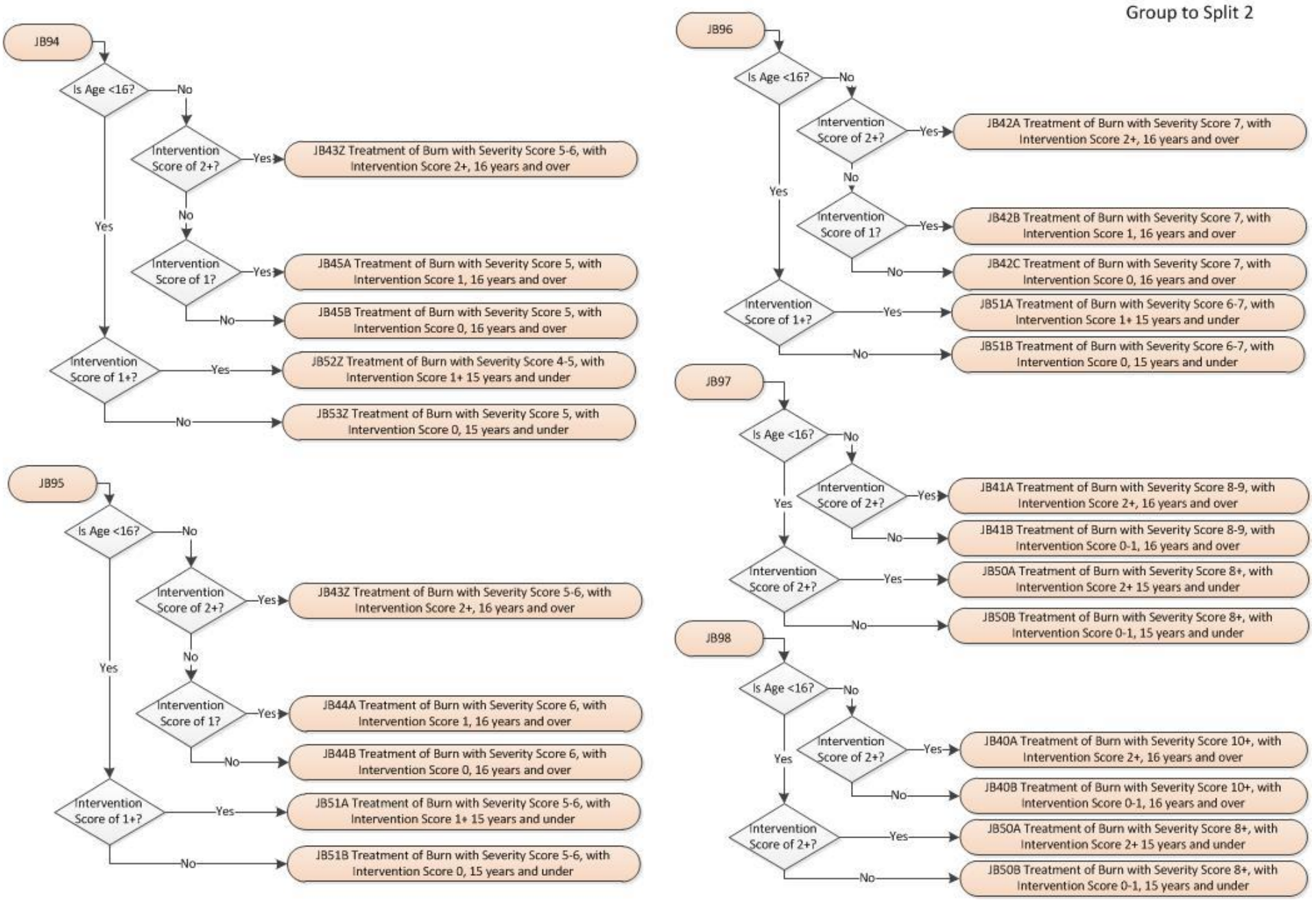
Code to Group – Core 1 (2)




Key
Core 7 logic
Core 1 logic
Core 3 logic
To Group to Split
To Core 3 Escalation
Core 3 escalation
Base HRG From Core 7
Is inhalation injury present plus invasive ventilation procedures?
Yes
No
Age 80+?
Yes
No
Are 2+ areas of face/hands/feet burned?
Yes
No
JB_CC Value = 3+
Yes
No
Escalate up 3 HRG roots
Escalate up 2 HRG roots
Age 60+?
Yes
No
Are 3+ areas of face/hands/feet burned?
Yes
No
Are 2+ areas of face/hands/feet burned?
Yes
No
JB_CC Value = 3+
Yes
No
JB_CC Value = 6+
Yes
No
Escalate up 2 HRG roots
Escalate up 2 HRG roots
Are 2+ areas of face/hands/feet burned?
Yes
No
JB_CC Value = 6+
Yes
No
JB_CC Value = 3+
Yes
No
Escalate up 2 HRG roots
Escalate up 1 HRG root
JB_CC Value = 9+
Yes
No
JB_CC Value = 3+
Yes
No
Escalate up 3 HRG roots
Escalate up 2 HRG roots
Escalate up 1 HRG root
JB_CC Value = 6+
Yes
No
Escalate up 2 HRG roots
JB_CC Value = 3+
Yes
No
Escalate up 1 HRG root
No escalation
Core 3 Escalation
For Base HRGs of JB91 – JB97
Up a maximum of 3 severity levels (or to JB98 – whichever comes first)
i.e. from JB91 (Severity 2) to JB94 (Severity 5) max, from JB96 to JB98 max
Age
60+ = up 1, 80+ = up 2
Burn to face, hands or feet
2 of = up 1, 3 of = up 2
JB_CC score
3 = up 1, 6 = up 2, 9 = up 3
Inhalation injury with invasive ventilation
= up 3
These work in combination i.e.
Patient age 65, burn to face and hand
= up 1 for age, up 1 for burn to face, hands, feet (2 of) = up 2
Patient age 85 with JB_CC score of 7
= up 2 for age, up 2 for JB_CC score 6
= up 4 = maximum escalation of up 3







Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter JC – Skin Procedures

Subchapter **JC Skin Procedures** covers all skin procedures for patients of all ages, delivered in admitted or non-admitted care settings.

The skin procedure HRGs within this subchapter are split based on the complexity of surgery, with multiple procedure logic employed within the majority of the procedure HRGs.

Age splits are employed in the majority of HRGs within this subchapter: There are HRG splits for post-adolescent patients (13 years and over) and others for pre-adolescent patients (12 years and under), as well as standard adult/child splits (19 years and over/18 years and under).

There are also HRGs specific to high volume procedures, e.g. patch testing, split by complex and standard, photodynamic therapy, phototherapy and photochemotherapy.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**11**	**12**
Total HRG Roots	**8**	**8**
Procedure-driven HRGs	11	12
Diagnosis-driven HRGs	0	0
Age Splits	Yes	Yes
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

All the minor and intermediate procedure HRGs within this subchapter have maximum length of stay logic to ensure that minor procedures, such as dressing of bed sore, are not used to determine the HRG for a long-stay medical patient, e.g. a person who has suffered a stroke.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

New HRGs have been created

The paediatric age splits on the Minor and Intermediate skin procedure HRGs within this subchapter have been amended from 12 years and under / 13 years and over to more typical 18 years and under / 19 years and over split, to more appropriately reflect the clinical treatment of paediatric patients. This has resulted in the deletion of four HRGs to be replaced with four new HRGs:

- **JC42C Intermediate Skin Procedures, 19 years and over**
- **JC42D Intermediate Skin Procedures, 18 years and under**
- **JC43C Minor Skin Procedures, 19 years and over**
- **JC43D Minor Skin Procedures, 18 years and under**

The paediatric age split has been removed from HRG root **JC47 Phototherapy or Photochemotherapy** as it is not necessary to differentiate between adults and children undergoing this treatment. This has resulted in the deletion of two HRGs to be replaced with one new HRG:

- **JC47Z Phototherapy or Photochemotherapy**

OPCS- 4 Unspecified (-.9) global review

Within this subchapter ***S56.9 Unspecified exploration of other skin of head or neck*** has been remapped from base HRG root **JC42 Intermediate Skin Procedures** to **JC43 Minor Skin Procedures** to match the mapping of the equivalent .5 and .6 codes within the OPCS-4 rubric.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.
Within this subchapter new code ***S07.2 Photodynamic laser therapy to lesion of skin*** has been mapped to base HRG root **JC46 Photodynamic Therapy** to reflect that it is a type of photodynamic therapy.

Subchapter JD – Skin Disorders

Subchapter **JD Skin Disorders** covers all skin disorders in adult patients. It includes activity undertaken in an inpatient and day case setting.

The adult diagnosis-driven HRGs within this subchapter are all within a single HRG root, **JD07 Skin Disorders**, and have both interactive CC splits – up to a maximum of six levels – and intervention splits, to more appropriately differentiate expected resource usage between routine and complex patients.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**10**	**10**
Total HRG Roots	**1**	**1**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	10	10
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter KA – Endocrine System Disorders

Subchapter **KA Endocrine System Disorders** covers endocrine system disorders for adult patients and endocrine procedures for patients of all ages, with the exception of diabetes, which is covered in Subchapter **KB Diabetic Medicine**.

It includes activity undertaken in an inpatient, day case and non-admitted care setting.

The procedure-driven HRG roots within this subchapter are divided based on the site of surgery, thus there are HRGs for thyroid, parathyroid and adrenal procedures, respectively.

The adult diagnosis-driven HRG roots within this subchapter are divided based on disorder type.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**18**	**18**
Total HRG Roots	**7**	**7**
Procedure-driven HRGs	7	7
Diagnosis-driven HRGs	11	11
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Interactive CC splits are employed within all of the HRG roots within this subchapter – up to a maximum of three levels – to more appropriately differentiate expected resource usage between routine and complex patients.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

The creation of a new subchapter specific to neck imaging interventions, Subchapter **YC Neck Imaging Interventions**, has resulted in the creation of under image control combination codes for several neck procedures e.g. excisions, biopsies and drainage of thyroid gland. These procedure codes continue to map to Subchapter **KA Endocrine System Disorders** when not done under image control. This will result in a shift in activity from this subchapter to the new Subchapter **YC Neck Imaging Interventions**.

Subchapter KB – Diabetic Medicine

Subchapter **KB Diabetic Medicine** covers all diabetic disorders in adult patients and one diabetes-related procedure for patients of all ages. It includes activity undertaken in an inpatient, day case and non-admitted care setting.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	12	12
Total HRG Roots	4	4
Procedure-driven HRGs	1	1
Diagnosis-driven HRGs	11	11
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

The adult diagnosis-driven HRG roots within the subchapter are divided based on the type of diabetic complication, i.e. hypoglycaemia, hyperglycaemia and lower limb complications.

Interactive CC splits are employed within all of the diagnosis-driven HRG roots within this subchapter – up to a maximum of four levels – to more appropriately differentiate expected resource usage between routine and complex patients.

There is a single procedure-driven HRG within this subchapter, **KB04Z Continuous Subcutaneous Insulin Infusion**. This HRG has been designed specifically to accommodate the insertion of insulin pumps for patients of all ages.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter KC – Metabolic Disorders

Subchapter **KC Metabolic Disorders** covers all metabolic disorders in adults aged 19 years and over. It includes activity undertaken in an inpatient and day case setting.

There are two HRG roots within this subchapter, one for inborn errors of metabolism and one for fluid or electrolyte disorders.

Interactive CC splits are employed within both of the HRG roots within this subchapter – up to a maximum of five levels – to more appropriately differentiate expected resource usage between routine and complex patients.

In addition, intervention splits are employed within the HRG root **KC05 Fluid or Electrolyte Disorders**.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**9**	**9**
Total HRG Roots	**2**	**2**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	9	9
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter LA – Renal Procedures and Disorders

Subchapter **LA Renal Procedures and Disorders** includes specific renal procedures for patients of all ages and all adult non-malignant renal disorders. It includes activity undertaken in an inpatient, day case and non-admitted care setting.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	48	48
Total HRG Roots	14	14
Procedure-driven HRGs	14	14
Diagnosis-driven HRGs	34	34
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	No	No
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	Yes	Yes

The HRGs for dialysis for chronic kidney disease are generated from the National Renal Data Set (NRD) and sit in Subchapter **LD Renal Dialysis for Chronic Kidney Disease**.

HRGs for renal dialysis for acute kidney injury are unbundled, and sit in Subchapter **LE Renal Dialysis for Acute Kidney Injury**.

Within this subchapter there are procedure-specific HRGs for renal transplants and related care, that are split based on age: there are HRGs for adult (19 years and over) activity and others for paediatric (18 years and under) activity.

There is also an HRG specific to peritoneal dialysis associated procedures.

All of the minor procedure HRGs within this subchapter have maximum length of stay logic to ensure that minor procedures, such as the insertion of a peritoneal dialysis catheter, are not used to determine the HRG for a long stay medical patient, e.g. a person with an acute kidney injury.

The adult renal disorder HRGs are split by disorder type. Interactive CC splits, up to a maximum of five levels, are employed within all of the adult diagnosis-driven HRGs to more appropriately differentiate expected resource usage between routine and complex patients.

Intervention splits are also employed in all of the adult diagnosis-driven HRG roots.

HRGs covering non-transplant kidney procedures and the treatment of renal neoplasms sit within Subchapter **LB Urological and Male Reproductive System Procedures and Disorders** and Subchapter **YL Urological Imaging Interventions**.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

The specific logic required to derive the HRG root **LA97 Same Day Dialysis Admission or Attendance** requires a length of stay of 0 days and either a procedure or diagnosis code indicating that a patient of any age has been specifically admitted for dialysis for the treatment of chronic kidney disease or acute kidney injury. However, it should be noted that as patients receiving treatment for chronic kidney disease should be reported via the NRD rather than the Commissioning Data Set (CDS) it would not be expected that this HRG would be generated often for patients with chronic kidney disease.

Subchapter-specific Grouping Logic

The specific logic required to derive the HRG root **LA97 Same Day Dialysis Admission or Attendance** requires a length of stay of 0 days and either a procedure or diagnosis code indicating the patient has been specifically admitted for dialysis for the treatment of chronic kidney disease or acute kidney injury.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

Two ICD-10 congenital diagnosis codes, ***Q60.1 Renal agenesis, bilateral*** and ***Q60.6 Potter syndrome***, previously U grouped where the patient was 19 years or over. These codes have been remapped to base HRG **LA09 General Renal Disorders**, to reflect that, although it would be extremely rare for a patient to survive to adulthood with these conditions, there are no coding rules preventing the use of congenital diagnosis codes in adults (unlike the ***P Perinatal*** ICD-10 codes that appropriately U group if recorded in adult patient records, to align with national coding rules).

Subchapter LB – Urological and Male Reproductive System Procedures and Disorders

Subchapter **LB Urological and Male Reproductive System Procedures and Disorders** covers urological and male reproductive system procedures for patients of all ages and adult disorders, with the exception of renal conditions and procedures relating to renal failure, which are covered in Subchapters **LA Renal Procedures and Disorders**, **LD Renal Dialysis for Chronic Kidney Disease** and **LE Renal Dialysis for Acute Kidney Injury**.

Subchapter LB includes activity undertaken in an inpatient, day case and non-admitted care setting.

It does not include urological interventional radiology procedures, which are included in Subchapter **YL Urological Imaging Interventions**.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	148	149
Total HRG Roots	61	62
Procedure-driven HRGs	92	93
Diagnosis-driven HRGs	56	56
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

The urological procedure HRGs within this subchapter are split based on whether they are open, laparoscopic, or endoscopic; on the organ operated on, e.g. bladder, kidney / ureter, penis; and on the complexity of surgery.

Multiple procedure logic is employed throughout the majority of HRGs within this subchapter, as are age splits. There are specific HRGs for adult activity (19 years and over) and others for paediatric activity (18 years and under). There are also HRGs specific to the treatment of infants (0 to 1 year of age) and those for older children (2 to 18 years). Escalation to an HRG with a higher expected resource use also occurs, where appropriate, when procedures are performed bilaterally, or where surgery is robotically-assisted.

There are a handful of HRGs specific to high-volume procedures, e.g. diagnostic flexible cystoscopy and prostate biopsies. There are also specific HRGs for procedures that use high-cost devices, including HRGs specific to the insertion of neurostimulators and neurostimulator electrodes for the treatment of urinary incontinence.

All minor procedure HRGs within this subchapter have maximum length of stay logic to ensure that minor procedures, such as urinary catheterisation, are not used to determine the HRG for a long-stay medical patient, e.g. a person who has suffered a stroke.

The adult diagnosis-driven urological disorder HRGs within this subchapter are disorder-specific.

Interactive CC splits, up to a maximum of five levels, are employed within the majority of both diagnosis-driven and procedure-driven HRGs to more appropriately differentiate expected resource usage between routine and complex patients. Intervention splits are also employed in the majority of adult diagnosis-driven HRG roots.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

HRGs have been deleted

LB49Z High Intensity Focused Ultrasound (Male and Female) has been deleted on clinical advice and the three procedure codes that mapped to this HRG have been remapped. OPCS-4 code ***M49.7 High intensity focused ultrasound of bladder*** has been remapped to **LB12Z Intermediate Open Bladder Procedures**, OPCS-4 code ***M71.1 High intensity focused ultrasound of prostate*** has been remapped to a new HRG, **YL30Z Percutaneous Ablation of Lesion of Prostate** within Subchapter **YL Urological Imaging Interventions** and OPCS-4 code ***Q20.6 Focused ultrasound to lesion of uterus*** has been remapped to **MA24Z Minor Upper Genital Tract Procedures** within Subchapter **MA Female Reproductive System Procedures**.

Changes made to logic

To ensure that the design aligns with national coding rules, logic on OPCS.4 code ***X45.1 Donation of kidney*** has been amended so that HRG **LB46Z Live Donation of Kidney** will only be generated where there is an associated primary diagnosis of ***Z52.4 Kidney donor***, else the procedure will be ignored for grouping.

Remapping of codes to more appropriately reflect resource usage

OPCS-4 code ***T85.6 Block dissection of pelvic lymph nodes*** has been remapped to base HRG root **LB10 Major Open Bladder Procedures or Reconstruction**, to reflect the fact that this is equivalent in resource terms to a major procedure such as cystectomy, rather than complex procedures such as robotic prostocystectomy.

Combination code ***M498+Y021 Implantation of prosthesis into bladder*** has been created and mapped to base HRG root **LB15 Minor Bladder Procedures**. Logic has been added to escalate to HRG root **FF50 Complex General Abdominal Procedures**, when recorded with OPCS-4 code ***T46.2 Drainage of ascites NEC***. This is to appropriately accommodate subcutaneous implantation of a battery-powered ascites catheter drainage system.

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

Within this subchapter five new combination codes have been created to identify maintenance (including flushing) of bladder catheter, freeing of adhesions of bladder, reconstruction of prepuce, sampling and excision or biopsy of pelvic lymph nodes. Each combination code has been mapped to the appropriate HRG in terms of expected resource usage.

OPCS- 4 Unspecified (-.9) global review

Within this subchapter, ***N28.9 Unspecified plastic operations on penis*** has been remapped to base HRG root **LB56 Minor Penis Procedures** and ***X16.9 Unspecified operations for disorders of sex development*** has been remapped to base HRG root **LB53 Intermediate Open, Scrotum, Testis or Vas Deferens Procedures**, both to match the mapping of the equivalent .4 code within the respective OPCS-4 rubrics.

OPCS-4 Paired code review

Within this subchapter 12 paired combination codes have been created to ensure the appropriate escalation of robotic procedures, where coding rules state that paired code sequencing applies.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

Within this subchapter new code ***M68.3 Endoscopic insertion of prosthesis to compress lobe of prostate*** has been mapped to base HRG root **LB70 Complex Endoscopic, Prostate or Bladder Neck Procedures (Male and Female)** to reflect that it is a major endoscopic prostate procedure, with a significant device cost.

Subchapter LD – Renal Dialysis for Chronic Kidney Disease

The HRGs in Subchapter **LD Renal Dialysis for Chronic Kidney Disease** capture all renal dialysis activity for patients of all ages recorded within the National Renal Data Set (NRD), which is specific to renal dialysis for patients with chronic kidney disease.

HRGs specific to dialysis for acute kidney injury can be found in the unbundled subchapter **LE Renal Dialysis for Acute Kidney Injury**.

The HRGs within this subchapter are generated using data from the National Renal Data Set.

The haemodialysis HRGs are differentiated based on location (e.g. hospital, satellite or home), age (adult or child), vascular access type (e.g. catheter or fistula) and whether the patient has a blood-borne virus (that would require isolation).

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**26**	**26**
Total HRG Roots	**13**	**13**
Procedure-driven HRGs	26	26
Diagnosis-driven HRGs	0	0
Age Splits	Yes	Yes
Complications and Comorbidities Splits	N/A	N/A
Intervention Splits	N/A	N/A
Multiple Procedures	N/A	N/A
Procedure Combination Codes	N/A	N/A
Diagnosis-qualified	N/A	N/A
Subsidiary Procedure-qualified	N/A	N/A
Length of Stay-qualified	N/A	N/A

The peritoneal dialysis HRGs are split based on whether continuous ambulatory peritoneal dialysis (CAPD) or automated peritoneal dialysis (APD). The HRGs for the latter intervention are further split based on whether or not the intervention is assisted.

The HRGs in Subchapter LD are derived per session from the following data items [item reference in brackets] in the National Renal Data Set (NRD):

Renal Care

[1] Renal Treatment Modality – e.g. Haemodialysis, CAPD

[6] Renal Treatment Supervision Code – e.g. home, hospital

[75] Person Observation (Blood Test HBV Surface Antigen) – e.g. negative, positive

[77] Person Observation (Blood Test HCV) – e.g. negative, positive

[79] Person Observation (Blood Test HIV) – e.g. negative, positive

Dialysis

[182] Dialysis Access Type – e.g. AV fistula, haemodialysis catheter

Patient age (in years derived from date of session – date of birth)

Annex A is a flow diagram that demonstrates how each HRG is derived.

The grouper validates against allowable values only for renal treatment modality and renal treatment supervision code. However, for dialysis access type, blank values are accepted and, if used, will group to the “via haemodialysis catheter” HRG split. The three blood-borne virus fields also allow for blank values and if left blank will group to the “without blood-borne viruses” HRG split.

Annex B demonstrates the acceptable values for each field required for grouping and where validation is applicable.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter LD: Worked Examples

Cases A to **E** illustrate how HRG assignment is derived from the data in the NRD for haemodialysis patients of differing ages, with or without the presence of blood-borne viruses, at different sites and using different access types.

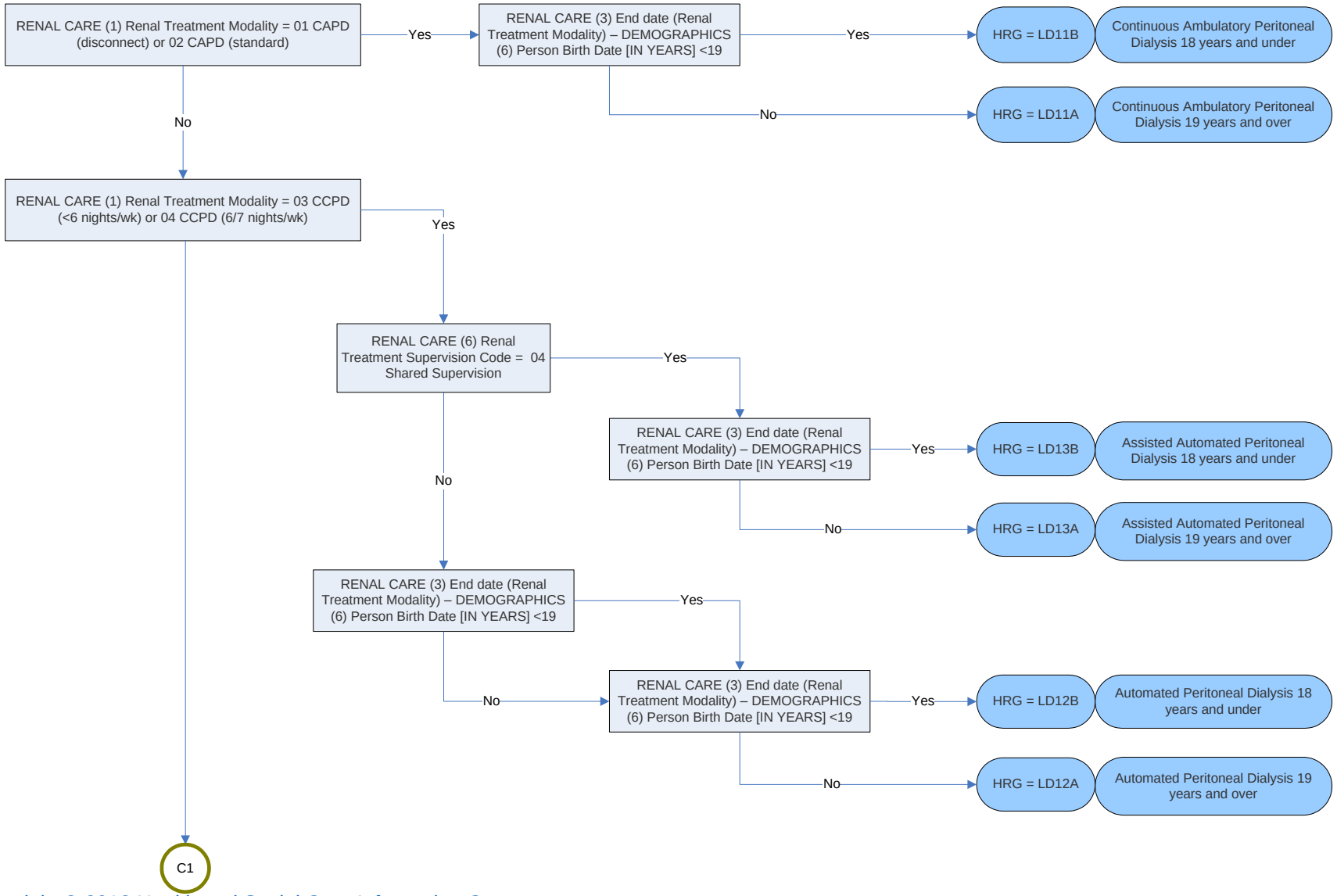
Case	Age	Renal Treatment Modality	Renal Treatment Supervision Code	Blood Tests	Type of Dialysis Access	HRG4+
A	62	05 Haemodialysis	02 Hospital	Blood test HBV surface antigen = NEG Blood test HCV antibody = NEG Blood test HIV = NEG	01 Non-tunnelled catheter	LD01A Hospital Haemodialysis or Filtration, with Access via Haemodialysis Catheter, 19 years and over
B	14	05 Haemodialysis	02 Hospital	Blood test HBV surface antigen = NEG Blood test HCV antibody = NEG Blood test HIV = NEG	01 Non-tunnelled catheter	LD01B Hospital Haemodialysis or Filtration, with Access via Haemodialysis Catheter, 18 years and under
C	25	05 Haemodialysis	02 Hospital	Blood test HBV surface antigen = NEG Blood test HCV antibody = NEG Blood test HIV = NEG	03 Arteriovenous fistula	LD02A Hospital Haemodialysis or Filtration, with Access via Arteriovenous Fistula or Graft, 19 years and over

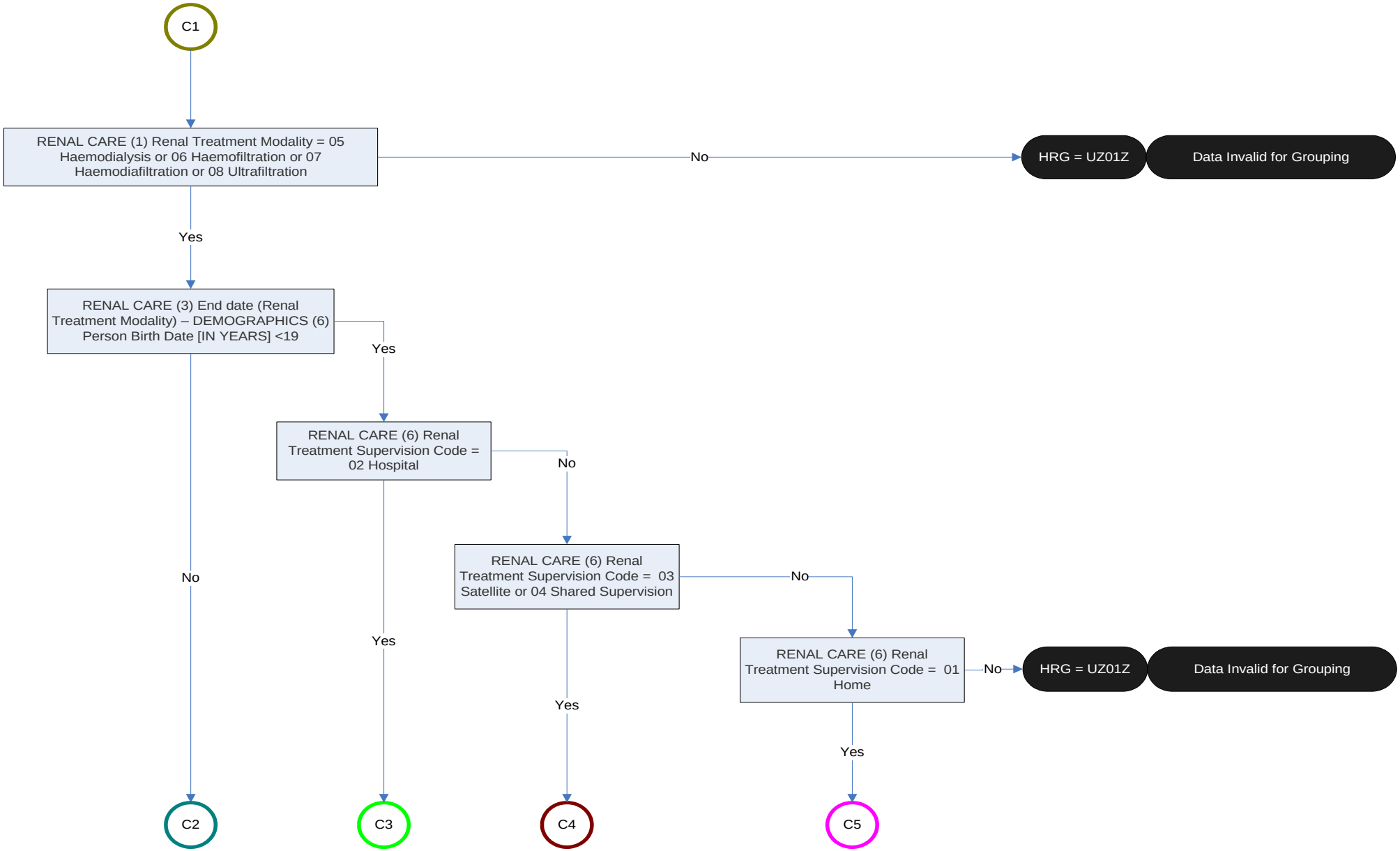
Case	Age	Renal Treatment Modality	Renal Treatment Supervision Code	Blood Tests	Type of Dialysis Access	HRG4+
D	25	05 Haemodialysis	02 Hospital	Blood test HBV surface antigen = NEG Blood test HCV antibody = **POS** Blood test HIV = NEG	03 Arteriovenous fistula	LD04A Hospital Haemodialysis or Filtration, with Access via Arteriovenous Fistula or Graft, with Blood-Borne Virus, 19 years and over
E	25	05 Haemodialysis	01 Home	Blood test HBV surface antigen = NEG Blood test HCV antibody = **POS** Blood test HIV = NEG	03 Arteriovenous fistula	LD10A Home Haemodialysis or Filtration with Access via Arteriovenous Fistula or Graft, 19 years and over

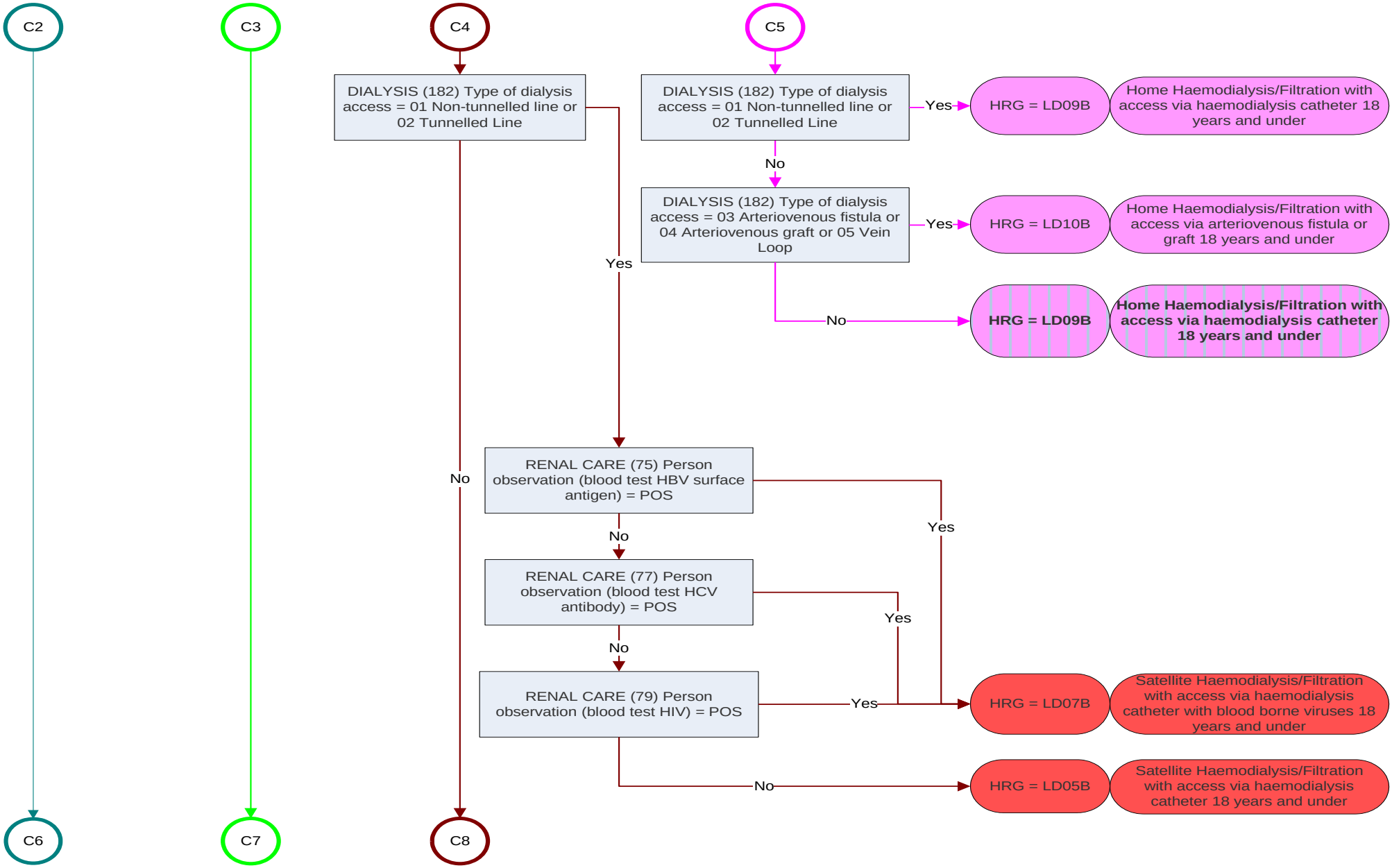
Cases F to **H** illustrate how HRG assignment is derived using the data from the NRD for peritoneal dialysis patients of differing ages, with or without the presence of blood-borne viruses, at different sites and using different access types.

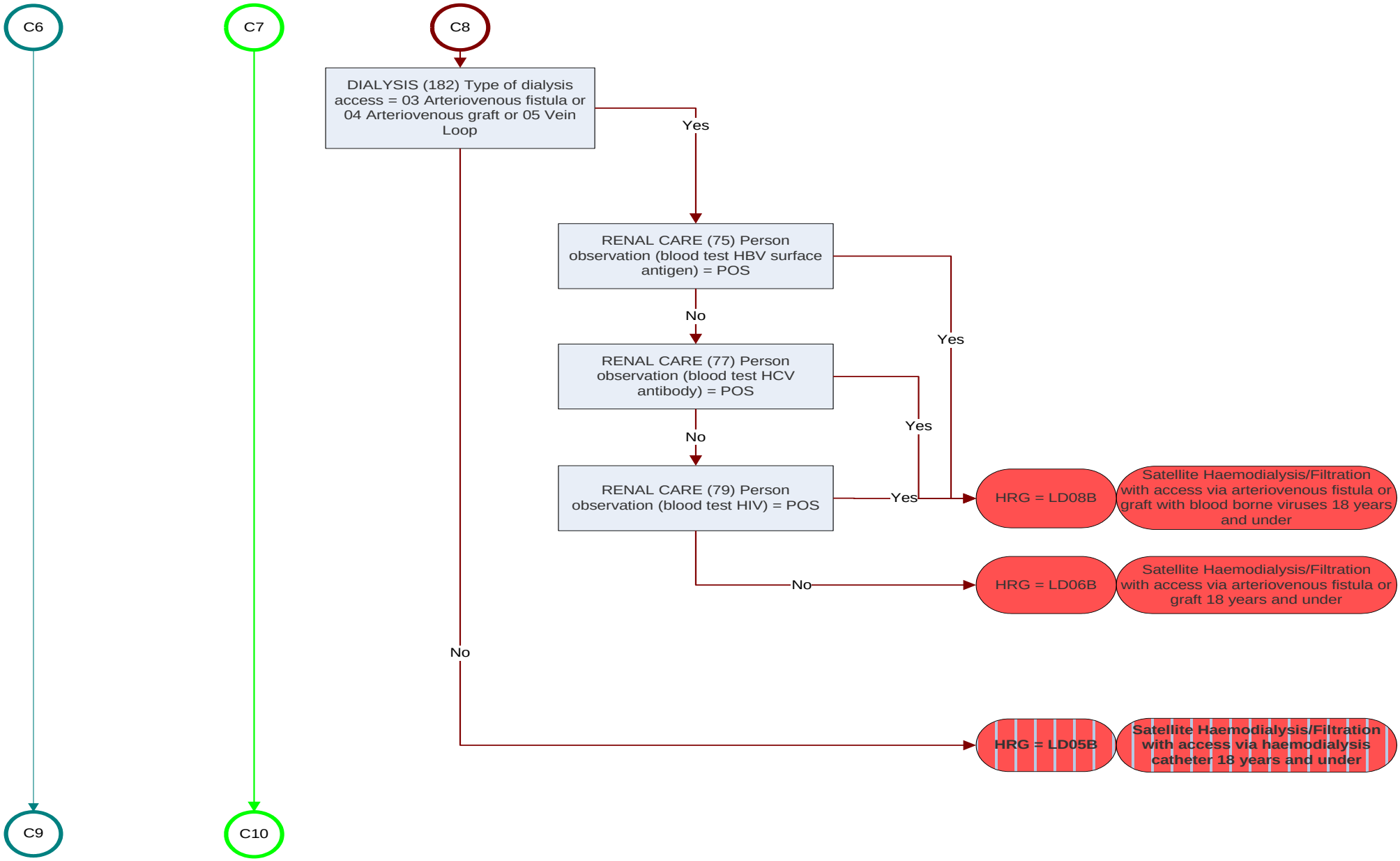
Case	Age	Renal Treatment Modality	Renal Treatment Supervision Code	Blood Tests	Type of Dialysis Access	HRG4+
F	62	02 CAPD (standard)	01 Home	Blood test HBV surface antigen = NEG Blood test HCV antibody = NEG Blood test HIV = NEG	06 PD catheter	LD11A Continuous Ambulatory Peritoneal Dialysis, 19 years and over
G	14	04 CCPD (6/7 nights/wk)	01 Home	Blood test HBV surface antigen = NEG Blood test HCV antibody = NEG Blood test HIV = NEG	06 PD catheter	LD12B Automated Peritoneal Dialysis, 18 years and under
H	62	04 CCPD (6/7 nights/wk)	04 Shared supervision	Blood test HBV surface antigen = NEG Blood test HCV antibody = NEG Blood test HIV = NEG	06 PD catheter	LD13A Assisted Automated Peritoneal Dialysis, 19 years and over

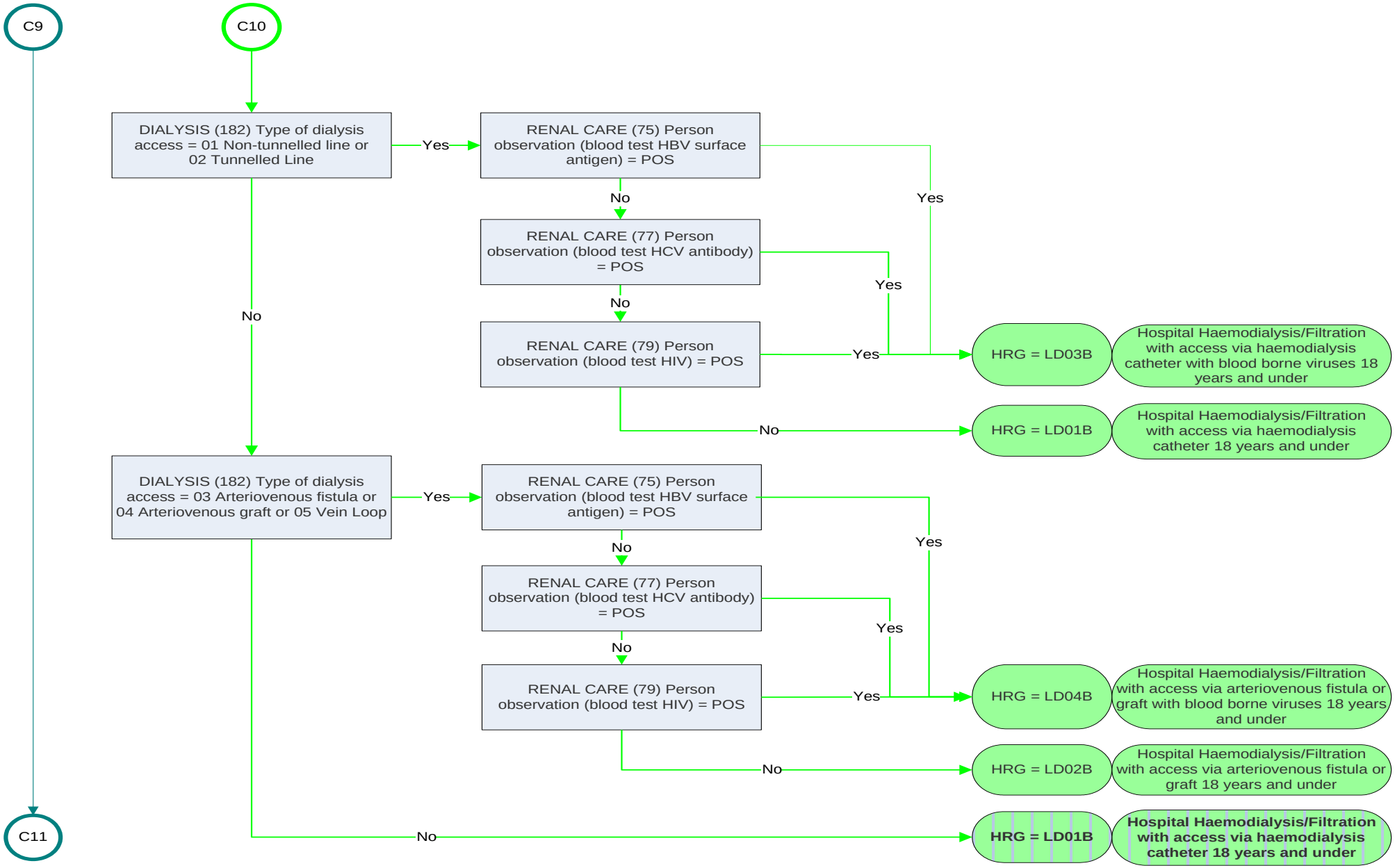
Subchapter LD: Annex A

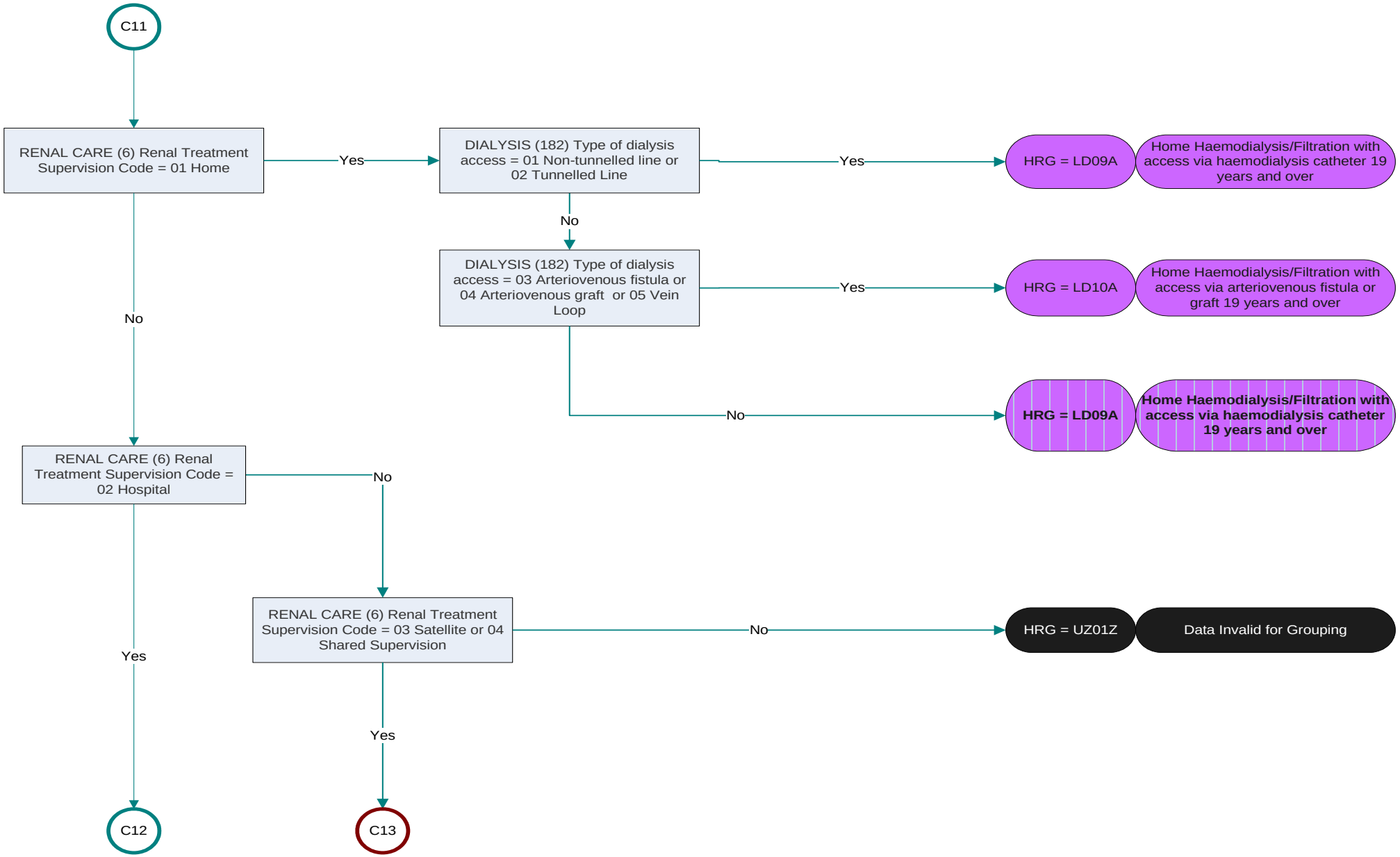


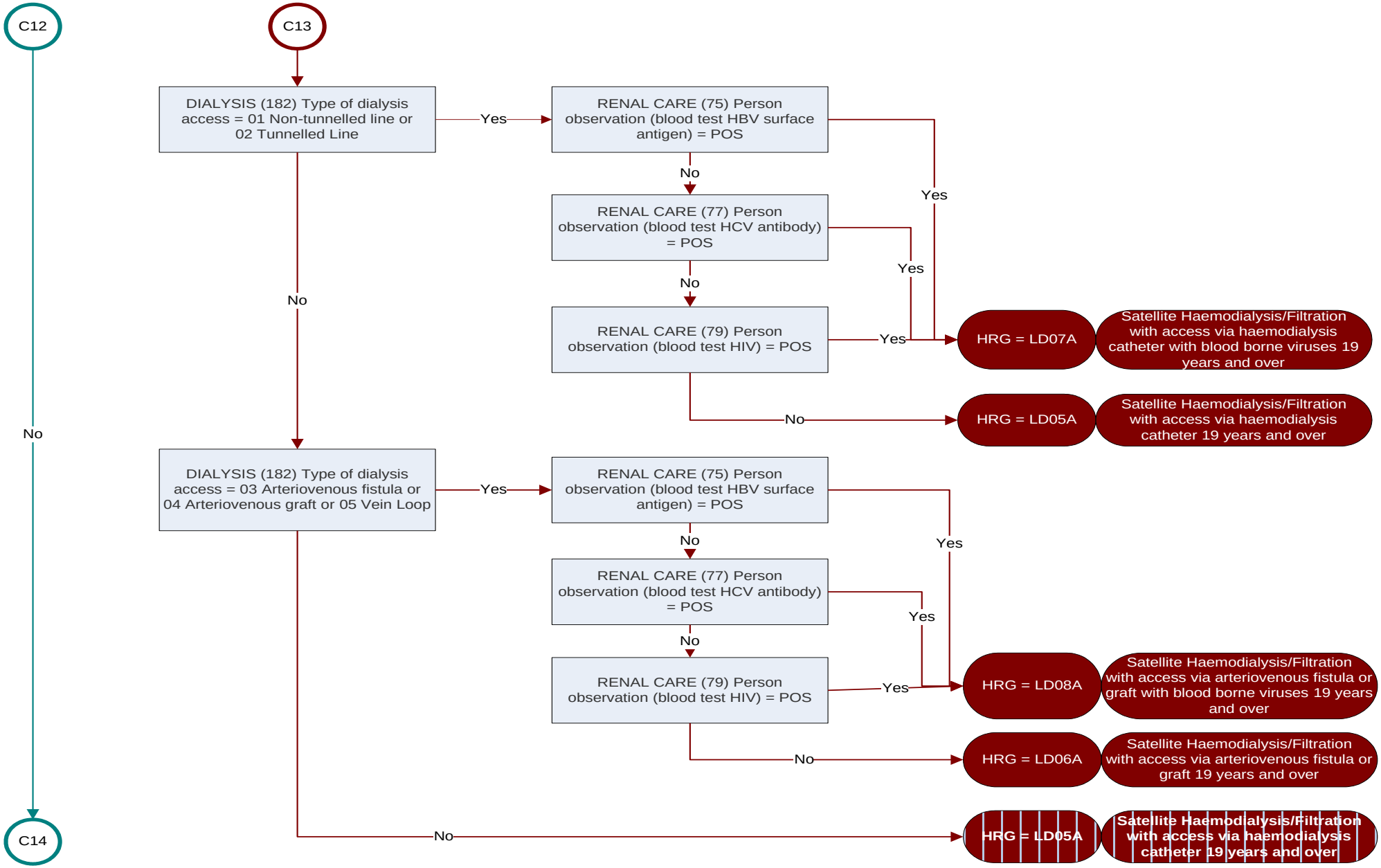


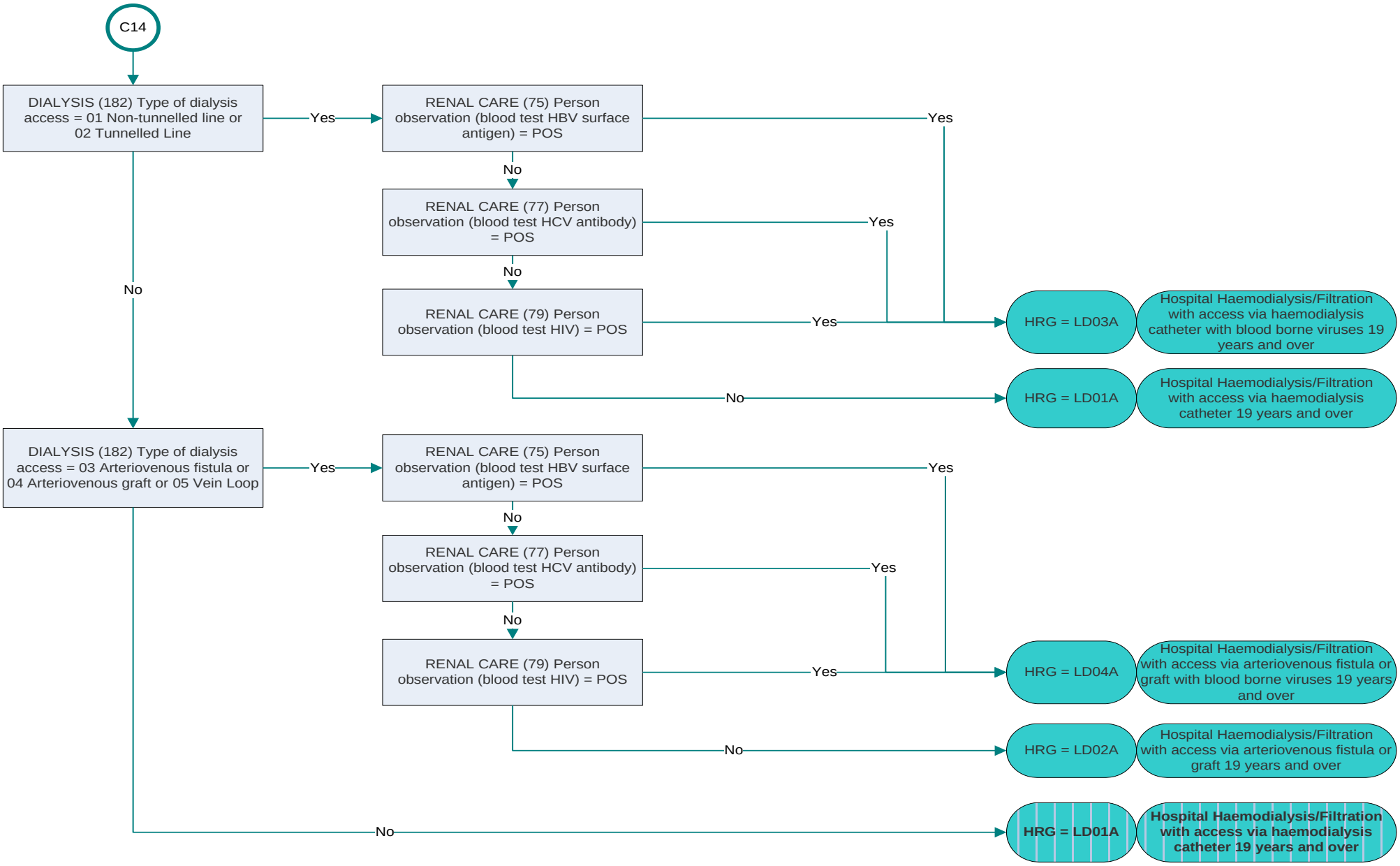












Subchapter LD:
Annex B
List of required NRD fields, acceptable values and validation applicable for the generation of LD Renal Dialysis HRGs

Renal Treatment Modality	Description
01	CAPD (disconnect)
02	CAPD (standard)
03	CCPD (<6 nights/wk)
04	CCPD (6/7 nights/wk)
05	Haemodialysis
06	Haemofiltration
07	Haemodiafiltration
08	Ultrafiltration
09	Transplant (cad - HB)
10	Transplant (cad - NHB)
11	Transplant (LRD)
12	Transplant (LUD)
13	Conservative care
14	Recovery of renal function
15	None
Validation	Only on list. Leading zero must be included for values lower than 10.

* Note 09-15 will map to U group HRG (not dialysis activity)

Treatment Supervision Code	Description
01	Home
02	Hospital
03	Satellite
04	Shared supervision
Validation	Only on list. Leading zero must be included.

Type of dialysis access (Current)	Description
01	Non-tunnelled line
02	Tunnelled line
03	Arteriovenous fistula (AVF)
04	Arteriovenous graft (AVG)
05	Vein loop
06	PD catheter
07	PD catheter temp
Validation	On list plus blank. Leading zero must be included.

Person observation (blood test HBV surface antigen)	Description
POS	Positive
NEG	Negative
UNK	Unknown
Validation	On list plus blank. Must be upper case.

Person observation (blood test HCV)	Description
POS	Positive
NEG	Negative
UNK	Unknown
Validation	On list plus blank. Must be upper case.

Person observation (blood test HIV)	Description
POS	Positive
NEG	Negative
UNK	Unknown
Validation	On list plus blank. Must be upper case.

Age	Description
(number)	(Calculated from session date - date of birth)
Validation	Within range 0 to 130 years

Fields not required for grouping but expected for identification of each session

Unique Patient ID	Description
Free text	An anonymised unique ID for each patient. Not NHS number
Validation	None

Date	Description
Free text	Date in standard format, e.g. 11/11/11 or 11-11-11
Validation	None

Subchapter LE – Renal Dialysis for Acute Kidney Injury

Subchapter **LE Renal Dialysis for Acute Kidney Injury** covers renal dialysis activity specifically for the treatment of acute kidney injury as part of an admitted patient care episode, for patients of all ages. The HRGs are unbundled in addition to the core HRG, and include activity undertaken in an inpatient and day case setting.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**4**	**4**
Total HRG Roots	**2**	**2**
Procedure-driven HRGs	4	4
Diagnosis-driven HRGs	0	0
Age Splits	Yes	Yes
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

The HRGs are generated for renal dialysis for patients with acute kidney injury in the APC setting.

Unlike dialysis for patients with chronic kidney disease, this activity is generated from the Commissioning Data Set (CDS) using OPCS-4 procedure codes, plus ICD-10 diagnosis codes.

Dialysis for the treatment of chronic kidney disease is covered within Subchapter **LD Renal Dialysis for Chronic Kidney Disease**.

The HRGs are only generated when a dialysis OPCS-4 code is recorded, in addition to a primary or secondary diagnosis indicating acute kidney injury. These diagnoses are listed below:

D59.3 Haemolytic-uraemic syndrome
N17.0 Acute renal failure with tubular necrosis
N17.1 Acute renal failure with acute cortical necrosis
N17.2 Acute renal failure with medullary necrosis
N17.8 Other acute renal failure
N17.9 Acute renal failure, unspecified
N99.0 Postprocedural renal failure
T79.5 Traumatic anuria

An **LE01* Haemodialysis for Acute Kidney Injury** HRG is generated for each occurrence of the following OPCS-4 codes in the patient record:

X40.1 Renal dialysis
X40.3 Haemodialysis NEC

An **LE02* Peritoneal Dialysis for Acute Kidney Injury** HRG is generated for each occurrence of the following OPCS-4 codes in the patient record:

X40.2 Peritoneal dialysis NEC
X40.5 Automated peritoneal dialysis
X40.6 Continuous ambulatory peritoneal dialysis

Further differentiation is also applied, based on age, in order to take into account the different expected resource usage of treating children versus adults.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter MA – Female Reproductive System Procedures

Subchapter **MA Female Reproductive System Procedures** includes all female upper and lower genital tract procedures for patients of all ages. It includes activity undertaken in inpatient, day case and non-admitted care settings.

The HRGs within this subchapter are split into open procedures, laparoscopic procedures and procedures specific to the treatment of malignancy and pelvic peritoneum adhesion. Some of the open procedure HRGs are further subdivided into upper and lower genital tract procedures.

There are up to six levels of complexity within the HRGs in this subchapter (minimal, minor, intermediate, major, very major and complex).

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	57*	48*
Total HRG Roots	42	34
Procedure-driven HRGs	55	46
Diagnosis-driven HRGs	0	0
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

*Includes two hybrid HRGs, which are driven by either procedure or diagnosis

There are procedure-specific HRGs for resection and ablation procedures, hysteroscopies, colposcopies, transvaginal ultrasounds and the insertion of an intra-uterine device.

There are also procedure-specific HRGs for the termination of a pregnancy, split by method and gestational age.

Multiple procedure logic is employed throughout the majority of HRGs within this subchapter. Escalation to an HRG with a higher expected resource use also occurs in this subchapter, where appropriate, for patients requiring surgery due to an ectopic pregnancy or for severe endometriosis.

Interactive CC splits are employed within many of the HRG roots within this subchapter – up to a maximum of three levels – to more appropriately differentiate expected resource usage between routine and complex patients.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

New HRGs have been created/ Existing HRGs deleted

A new HRG, **MA48Z Medical Treatment of Ectopic Pregnancy**, has been created to identify this specific treatment that includes a significant drug cost. This requires the OPCS-4 procedure code ***X37.3 Intramuscular chemotherapy*** to be recorded alongside a subsidiary code indicating gestational age or a primary diagnosis of ectopic pregnancy.

Several new HRGs have been created specific to the identification and differentiation of resource use associated with gynaecological “one-stop” clinics where a patient undergoes

several minor procedures during the same admission or attendance. This is an expansion of the existing HRGs that cover these procedures:

- **MA41Z Transvaginal Ultrasound with Biopsy and Implantation of Intrauterine Device**
- **MA42Z Transvaginal Ultrasound with Implantation of Intrauterine Device**
- **MA43Z Transvaginal Ultrasound with Salpingography**
- **MA44Z Salpingography**
- **MA45Z Diagnostic Hysteroscopy with Transvaginal Ultrasound**
- **MA46Z Diagnostic Hysteroscopy with Transvaginal Ultrasound, with Biopsy**
- **MA47Z Diagnostic Hysteroscopy with Transvaginal Ultrasound and Implantation of Intrauterine Device**

Due to the expansion of multiple procedure logic there is sufficient activity within HRG **MA09Z Intermediate, Laparoscopic or Endoscopic, Upper Genital Tract Procedures** to warrant the addition of CC splits to this HRG to more appropriately differentiate expected resource usage. This has led to the deletion of this one HRG and its replacement with two new HRGs:

- **MA09A Intermediate, Laparoscopic or Endoscopic, Upper Genital Tract Procedures, with CC Score 2+**
- **MA09B Intermediate, Laparoscopic or Endoscopic, Upper Genital Tract Procedures, with CC Score 0-1**

Changes made to logic

Multiple procedure logic has been expanded to include the escalation of minor endoscopic / laparoscopic procedures within base HRG roots **MA10 Minor, Laparoscopic or Endoscopic, Upper Genital Tract Procedures** and **MA12 Resection or Ablation Procedures for Intrauterine Lesions** to escalate to HRG root **MA09 Intermediate, Laparoscopic or Endoscopic, Upper Genital Tract Procedures** where additional minor procedures are also recorded.

Multiple procedure logic has been expanded to include the gynaecological fistula repair procedures that map to base HRG **MA02 Very Major Open, Upper or Lower Genital Tract Procedures** to escalate to **MA01Z Complex Open, Upper or Lower Genital Tract Procedures** if an additional major procedure is recorded.

The gynaecological malignancy diagnosis logic has been expanded to ensure that, where appropriate, both upper and lower female genital tract procedures undertaken for the treatment of cancer, map to the cancer-specific HRGs.

Both the **MA_Adhesiolysis** list and logic has been expanded to include all gynaecology-related adhesion procedures, resulting in the creation of a new combination code ***T368+Y181 Freeing of adhesions of omentum***.

Additional gynaecological-related diagnoses have been added to the list **MA_Gynae_Diag** to ensure that peritoneal procedures, undertaken to treat gynaecological conditions, appropriately group to gynaecological HRGs. However, additional logic has been added to check for sex of female in addition to these diagnoses. This will result in a shift in activity from Subchapter **FF Digestive System Open and Laparoscopic Procedures** to HRGs within Subchapter **MA Female Reproductive System Procedures**.

Remapping of codes to more appropriately reflect resource usage

To ensure that when gynaecological examinations are undertaken under general anaesthetic the resource usage is appropriately accommodated, new combination codes ***Q551+Y80 Examination of female genital tract under general anaesthetic and Papanicolau smear*** and ***Q552+Y80 Examination of female genital tract under general anaesthetic*** have been created and mapped to **MA22Z Minor Lower Genital Tract Procedures**.

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

Within this subchapter, in addition to the combination codes used to identify female genital tract mutilation repair, three further combination codes have been created; ***P238+Y032 Renewal of transvaginal pelvic organ prolapse mesh***, ***P138+Y20 Biopsy of female perineum*** and ***P218+Y271 Autograft to vagina***, and mapped to the appropriate resource HRG.

OPCS- 4 Unspecified (-.9) global review

Within this subchapter seven ***.9 Unspecified*** codes have been remapped to lower expected resource HRGs.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

Within this subchapter several new codes have been authored for vaginal tape or mesh insertion, partial and full removals. In addition there are new codes specific to excision and biopsy of lesion of labia, and colposcopy of vagina. All these codes have been mapped to the appropriate HRG in resource terms, with the appropriate logic and list membership, under clinical advisement.

Subchapter MB – Female Reproductive System Disorders

Subchapter **MB Female Reproductive System Disorders** covers female reproductive system disorders for adults and some child activity. It includes activity undertaken in an inpatient and day case setting.

There are three HRG roots within this subchapter; one for threatened and spontaneous miscarriages and two that contain all other gynaecological disorders, split based on malignant or non-malignant disorders.

Interactive CC splits are employed within the majority of the HRG roots within this subchapter – up to a maximum of five levels – to more appropriately differentiate expected resource use between routine and complex patients.

In addition, intervention splits are also employed within all of the HRG roots.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	17	17
Total HRG Roots	3	3
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	17	17
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

The majority of diagnosis-driven activity relating to the treatment of children (aged 18 years and under) for female reproductive system disorders groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter MC – Assisted Reproductive Medicine

Subchapter **MC Assisted Reproductive Medicine** includes procedures within assisted reproductive medicine for all ages of patient. It includes activity undertaken in inpatient, day case and non-admitted care settings.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	11	11
Total HRG Roots	11	11
Procedure-driven HRGs	11	11
Diagnosis-driven HRGs	0	0
Age Splits	No	No
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

The HRGs within this subchapter are split into collection of sperm for males and into intrauterine insemination (IUI) and in-vitro fertilisation (IVF) procedures for females.

There are two HRGs for collection of sperm.

The IUI HRGs are split by with or without superovulation, and with or without donor sperm.

There is one HRG for implantation of embryo, with the other IVF HRGs being split by type of oocyte recovery; whether donor, with intracytoplasmic sperm injection (ICSI) or with pre-implantation genetic diagnosis.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global procedure hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter NZ – Obstetric Medicine

Subchapter **NZ Obstetric Medicine** covers obstetric procedures and diagnoses for patients of all ages. It also accommodates obstetric aspects of embryology and placental disorders. It includes activity undertaken in inpatient, day case and non-admitted care settings.

The delivery HRGs within this subchapter are split based on the type of delivery: normal, assisted or caesarean section.

The normal and assisted delivery HRGs are further split to take into account delivery interventions. The splits are based on whether a single, or combination of, the following interventions are undertaken: induction, epidural or post-partum surgical intervention.

The caesarean section HRGs are split based on whether the surgery was planned or otherwise.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**55**	**55**
Total HRG Roots	**25**	**25**
Procedure-driven HRGs	43	43
Diagnosis-driven HRGs	12	12
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	Yes	Yes

The ante-natal disorder HRGs are split based on obstetric complexity level. There are HRGs specific to standard and specialised ante-natal scans as well as other ante-natal therapeutic procedures.

There are post-natal disorder HRGs and also an HRG specific to post-natal therapeutic procedures.

There are HRGs specific to fetal medicine.

Interactive CC splits, up to a maximum of three levels, are employed within the majority of ante- and post-natal disorder HRGs as well as the delivery HRGs, to more appropriately differentiate expected resource usage between routine and complex patients.

In accordance with national coding standards, unlike all other CC lists where only secondary diagnoses contribute towards the CC score, for the obstetric delivery HRGs all diagnoses, including the primary diagnosis, can contribute towards to the CC score.

To reiterate, this subchapter **includes** diagnosis-driven activity relating to the treatment of children (aged 18 years and under). This activity is grouped to an HRG in this subchapter instead of to an HRG in Chapter **P Diseases of Childhood and Neonates** to more appropriately reflect the nature of the service provision of obstetric medicine.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

Three new combination codes have been created for procedures indicative of the treatment of postpartum haemorrhage; ***R308+Y258 Other specified suture of delivered uterus*** (for b-lynch sutures), ***R308+Y443 Temporary occlusion of delivered uterus*** (for bakri balloon) and ***L703+Z382 Ligation of internal iliac artery***. These codes have been mapped to the appropriate expected resource HRG and also added to the postpartum surgical intervention list, alongside ***L713+UTERINE Percutaneous transluminal embolisation of uterine artery***, to ensure that the additional expected resources associated with these procedures is appropriately reflected in the delivery HRGs.

Subchapter PB – Neonatal Disorders

Subchapter **PB Neonatal Disorders** covers neonatal medicine for patients aged 18 years and under. It includes activity undertaken in inpatient and day case settings.

It does not include critical care services, which are covered in the unbundled subchapter **XA Neonatal Critical Care**.

This subchapter comprises Neonatal disorders, differentiated by source of patient admission, and healthy babies

For patients receiving treatment for conditions originating in the perinatal period, the age check logic is now “less than two years of age” to reflect that there may be a minority of patients that continue to be treated for these conditions past their first birthday.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	20	20
Total HRG Roots	4	4
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	20	20
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

In accordance with national coding rules, conditions within ICD-10 rubrics **P00-P04** require a discharge method of stillbirth in order to generate a valid HRG within this subchapter. This therefore includes ICD-10 codes **P01.3 Fetus and newborn affected by polyhydramnios** and **P01.4 Fetus and newborn affected by ectopic pregnancy,** which have this additional logic to check whether the Discharge method is “stillbirth” in order to ensure the derivation of the most appropriate HRG according to national coding rules.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter PC – Paediatric Ear Nose and Throat Disorders

Subchapter **PC Paediatric Ear, Nose and Throat Disorders** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) ear, nose and throat disorders, in line with the requirements of the Casemix Design Framework.

Subchapter PC does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within all of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Ear Nose and Throat Disorders.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**4**	**4**
Total HRG Roots	**1**	**1**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	4	4
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter PD – Paediatric Respiratory Disorders

Subchapter **PD Paediatric Respiratory Disorders** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) respiratory disorders, in line with the requirements of the Casemix Design Framework.

Subchapter PD does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within all of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Respiratory Disorders.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	24	24
Total HRG Roots	6	6
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	24	24
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

ICD-10 diagnosis codes within 3-digit category ***B39 Histoplasmosis*** have been remapped, where age is 18 years and under, 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 infection which would consume similar resource to other major infections.

Subchapter PE – Paediatric Cardiology Disorders

Subchapter **PE Paediatric Cardiology Disorders** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) cardiology disorders, in line with the requirements of the Casemix Design Framework.

Subchapter PE does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within all of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Cardiology Disorders.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	12	12
Total HRG Roots	3	3
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	12	12
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

ICD-10 diagnosis codes within 3-digit category ***B39 Histoplasmosis*** have been remapped, where age is 18 years and under, 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 infection which would consume similar resource to other major infections.

Subchapter PF – Paediatric Gastroenterology Disorders

Subchapter **PF Paediatric Gastroenterology Disorders** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) gastroenterology disorders, in line with the requirements of the Casemix Design Framework.

Subchapter PF does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within all of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Gastroenterology Disorders.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	17	17
Total HRG Roots	5	5
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	17	17
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter PG – Paediatric Hepatobiliary Disorders

Subchapter **PG Paediatric Hepatobiliary Disorders** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) hepatobiliary disorders, in line with the requirements of the Casemix Design Framework.

Subchapter PG does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within the single HRG root, to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Hepatobiliary Disorders.

Composition and Concepts		
	RC17/18	**RC16/17**
Total HRGs	**3**	**3**
Total HRG Roots	**1**	**1**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	3	3
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter PH – Paediatric Rheumatology Disorders

Subchapter **PH Paediatric Rheumatology Disorders** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) rheumatology disorders, in line with the requirements of the Casemix Design Framework.

Subchapter PH does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within the single HRG root, to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Rheumatology Disorders.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**4**	**4**
Total HRG Roots	**1**	**1**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	4	4
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter PJ – Paediatric Dermatology Disorders

Subchapter **PJ Paediatric Dermatology Disorders** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) dermatology disorders, in line with the requirements of the Casemix Design Framework.

Subchapter PJ does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within all of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Dermatology Disorders.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**7**	**7**
Total HRG Roots	**2**	**2**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	7	7
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter PK – Paediatric Diabetology, Endocrinology and Metabolic Disorders

Subchapter **PK Paediatric Diabetology, Endocrinology and Metabolic Disorders** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) diabetology, endocrinology and metabolic disorders, in line with the requirements of the Casemix Design Framework.

Subchapter PK does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within all of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Diabetology, Endocrinology and Metabolic Disorders.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**11**	**11**
Total HRG Roots	**4**	**4**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	11	11
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter PL – Paediatric Renal Disorders

Subchapter **PL Paediatric Renal Disorders** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) renal disorders, in line with the requirements of the Casemix Design Framework.

Subchapter PL does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within all of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Renal Disorders.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	10	10
Total HRG Roots	3	3
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	10	10
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter PM – Paediatric Haematological-Oncology Disorders

Subchapter **PM Paediatric Haematological-Oncology Disorders** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) haematological-oncology disorders, in line with the requirements of the Casemix Design Framework.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**14**	**14**
Total HRG Roots	**6**	**6**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	14	14
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	Yes	Yes

Subchapter PM does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within some of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Haematological-Oncology Disorders, with an additional CC list specific to HRG root **PM45 Febrile Neutropenia with Malignancy** (see below).

Logic is applied to determine which activity should map to the HRG root **PM45 Febrile Neutropenia with Malignancy** and also to calculate the interactive CC score appropriate to this activity. This requires diagnosis codes from the lists Cancer, PM_Infection and PM_Neutropenia to be present within the episode/spell.

To ensure that diagnosis codes used to reach HRG root **PM45 Febrile Neutropenia with Malignancy** are not double counted, and to calculate an associated CC score, the CC splits within this HRG are calculated on a different basis.

This HRG has its own specific CC list, **PM45_CC**, which is used in conjunction with the list **PM45_Canc_Inf_Neut** to calculate a combined CC score from both lists. List **PM45_Canc_Inf** contains all the cancer, infection and neutropenia codes that, when combined, enable the generation of HRG root **PM45 Paediatric Febrile Neutropenia with Malignancy**, with a value of 1, and so all activity that maps to this HRG will have a minimum value of 3 from this list (as it includes primary diagnosis).

However, some patients may suffer from multiple cancers or infections, and therefore these patients will have a higher score from this list. This score may be combined with the score from list **PM45_CC** (the lists are mutually exclusive), to create a proxy CC score, which deducts a value of 3 (the codes that were used in the generation of the HRG root itself).

For example, a record with a value of 4 from list **PM45_Canc_Inf** plus a value of 2 from list **PM45_CC** will generate a CC score of 3, and will derive **PM45B Paediatric Febrile Neutropenia with Malignancy, with CC Score 3-5**.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter PN – Paediatric Non-Malignant Haematological Disorders

Subchapter **PN Paediatric Non-Malignant Haematological Disorders** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) non-malignant haematological disorders, in line with the requirements of the Casemix Design Framework.

Subchapter PN does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within all of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Non-Malignant Haematological Disorders.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	9*	9*
Total HRG Roots	4	4
Procedure-driven HRGs	2	2
Diagnosis-driven HRGs	5	5
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

*The design includes two hybrid HRGs which are driven by either procedure or diagnosis

There is one HRG root in this subchapter, **PN46 Paediatric Thalassaemia**, which is influenced or driven by OPCS-4 procedure codes. Additional logic has been added to the HRGs in this root to map paediatric patients to these HRGs when they have a blood transfusion as part of their treatment for thalassaemia.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter PP – Paediatric Ophthalmic Disorders

Subchapter **PP Paediatric Ophthalmic Disorders** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) ophthalmic disorders, in line with the requirements of the Casemix Design Framework.

Subchapter PP does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within both HRGs to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Ophthalmic Disorders.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**2**	**2**
Total HRG Roots	**1**	**1**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	2	2
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter PQ – Paediatric Immune System Disorders

Subchapter **PQ Paediatric Immune System Disorders** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) immune system disorders, in line with the requirements of the Casemix Design Framework.

Subchapter PQ does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within the single HRG root, to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Immune System Disorders.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**2**	**2**
Total HRG Roots	**1**	**1**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	2	2
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter PR – Paediatric Nervous System Disorders

Subchapter **PR Paediatric Nervous System Disorders** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) nervous system disorders, in line with the requirements of the Casemix Design Framework.

Subchapter PR does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within all of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Nervous System Disorders.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	22	22
Total HRG Roots	7	7
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	22	22
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter PT – Paediatric Mental Health Disorders

Subchapter **PT Paediatric Mental Health Disorders** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) mental health disorders, in line with the requirements of the Casemix Design Framework.

Subchapter PT does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within all of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Mental Health Disorders.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	4	4
Total HRG Roots	2	2
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	4	4
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Note that some paediatric activity for mental health conditions continues to map to the newly redesigned subchapter **WD Treatment of Mental Health Patients by Non-Mental Health Service Providers**.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter PV – Paediatric Trauma Medicine

Subchapter **PV Paediatric Trauma Medicine** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) trauma medicine, in line with the requirements of the Casemix Design Framework.

Subchapter PV does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within all of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Trauma Medicine.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**7**	**7**
Total HRG Roots	**3**	**3**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	7	7
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter PW – Paediatric Infectious Diseases

Subchapter **PW Paediatric Infectious Diseases** contains all diagnosis-driven activity relating to the treatment of children's (aged 18 years and under) infectious diseases, in line with the requirements of the Casemix Design Framework.

Subchapter PW does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within all of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Infectious Diseases.

Composition and Concepts		
	RC17/18	**RC16/17**
Total HRGs	**15**	**15**
Total HRG Roots	**4**	**4**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	15	15
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

ICD-10 diagnosis codes within 3-digit category ***B39 Histoplasmosis*** have been remapped, where age is 18 years and under, 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 infection which would consume similar resource to other major infections.

Subchapter PX – Paediatric Medicine

Subchapter **PX Paediatric Medicine** contains all diagnosis-driven activity relating to the treatment of children (aged 18 years and under) that does not otherwise fit within the more specific paediatric disorder subchapters, in line with the requirements of the Casemix Design Framework.

Subchapter PX does not include neonatal critical care or paediatric critical care – these are covered in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**, respectively.

Interactive CC splits are employed within the majority of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients. The CC lists for this subchapter are now specific to Paediatric Medicine.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**46**	**46**
Total HRG Roots	**19**	**19**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	46	46
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter RD – Diagnostic Imaging Procedures

Subchapter **RD Diagnostic Imaging Procedures** covers diagnostic imaging for patients of all ages, delivered in admitted or non-admitted care settings.

The unbundled HRGs in this subchapter relate to the examination type.

The diagnostic imaging (procedure) HRGs are separated based on the modality of scan (MRI, CT, DEXA, ultrasound, contrast fluoroscopy and simple echo).

The CT and MRI HRGs are split by the number of body areas scanned and whether contrast is used.

The ultrasound and contrast fluoroscopy HRGs are split by the time taken and by whether the scan is mobile/intraoperative. In addition, the ultrasound scans are split based on whether contrast is used.

There are also HRGs specific to more specialised scans such as complex CT, vascular ultrasound and ultrasound elastography.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	48*	47*
Total HRG Roots	38	37
Procedure-driven HRGs	48	47
Diagnosis-driven HRGs	1	1
Age Splits	Yes	Yes
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

*Includes one core HRG (**RD97Z**) that is driven by both diagnosis and procedure logic for admitted patient care and by procedure only for non-admitted patients. Both settings also utilise TFC.

Age splits are employed in several of the HRG roots specific to MRI, CT and simple echocardiogram; there are specific HRGs for adult activity (19 years and over) and others for paediatric activity (18 years and under). There are also HRGs specific to the treatment of young children (0 to 5 years of age) and those for older children (6 to 18 years).

There are two HRGs within this subchapter that are not unbundled HRGs.

RD97Z Same Day Diagnostic Imaging Admission or Attendance is generated when a diagnostic imaging scan has taken place and the treatment function code (TFC) is **812 Diagnostic Imaging**, no major procedures have taken place so the core HRG which would otherwise be generated is diagnosis-driven (or an attendance HRG in outpatients), and length of stay is zero days.

RD98Z Admission or Attendance for Diagnostic Imaging under General Anaesthetic is generated where a diagnostic imaging or nuclear medicine scan has taken place, a general anaesthetic OPCS-4 code is recorded, no major procedures have taken place so the core HRG which would otherwise be generated is diagnosis-driven (or an attendance HRG in outpatients), and the treatment function code is TFC **812 Diagnostic Imaging**.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

New HRGs have been created

A 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. This HRG requires:

- a diagnostic imaging or nuclear medicine scan to be recorded using appropriate OPCS-4 codes, and
- a general anaesthetic OPCS-4 code is recorded, and
- no major procedures have taken place and the core HRG which would otherwise be generated is diagnosis-driven (or an attendance HRG in outpatients), and
- the treatment function code is TFC **812** (**Diagnostic Imaging**)

Changes made to logic

The “empty core” (**RD97Z**) HRG has been amended to only be generated where length of stay is zero days. To reflect this change, the HRG label has been amended to **RD97Z Same Day Diagnostic Imaging Admission or Attendance**.

Remapping of codes to more appropriately reflect resource usage

OPCS-4 procedure code ***J50.1 T tube cholangiography*** has been remapped from HRG root **YG12 Other Percutaneous Diagnostic, Hepatobiliary or Pancreatic Procedures** to unbundled HRG root **RD30 Contrast Fluoroscopy Procedures with duration of less than 20 minutes**, to reflect that this is a diagnostic imaging, rather than imaging intervention, procedure.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.
Within this subchapter new code ***U36.5 Cone beam computed tomography NEC*** has been mapped to the Computerised Tomography Scan HRG roots (**RD20 Computerised Tomography Scan of One Area, without Contrast** to **RD27 Computerised Tomography Scan of more than Three Areas** inclusive, dependent on the number of body areas scanned and whether contrast is used) to reflect that it is a type of CT scan.

Subchapter RN – Nuclear Medicine Procedures

Subchapter **RN Nuclear Medicine Procedures** covers both diagnostic and therapeutic nuclear medicine procedures for patients of all ages, delivered in admitted or non-admitted care settings.

The unbundled HRGs in this subchapter relate to the type of test.

The diagnostic imaging procedures are split based on the modality or type of scan, e.g. PET-CT, SPECT-CT, PET, SPECT, nuclear bone scan etc.

The PET-CT and SPECT-CT HRGs are split by the number of body areas scanned.

There are also HRGs specific to molecular radiotherapy procedures.

Age splits are employed in the majority of these nuclear medicine HRGs; there are specific HRGs for adult activity (19 years and over) and others for paediatric activity (18 years and under). There are also HRGs specific to the treatment of young children (0 to 5 years of age) and those for older children (6 to 18 years).

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**69***	**69***
Total HRG Roots	**38**	**38**
Procedure-driven HRGs	69	69
Diagnosis-driven HRGs	1	1
Age Splits	Yes	Yes
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

*Includes one core HRG (**RN97Z**) that is driven by both diagnosis and procedure logic for admitted patient care and by procedure only for non-admitted patients. Both settings also utilise TFC.

Due to the limitation of the underlying OPCS-4 codes, for the majority of activity it is not yet possible to differentiate based on the type of radionuclide used.

There is one HRG within this subchapter that is not unbundled; **RN97Z Same Day Nuclear Medicine Admission or Attendance** is generated when a nuclear medicine scan has taken place, the treatment function code (TFC) is **812 Diagnostic Imaging**, no major procedures have taken place so the core HRG which would otherwise be generated is diagnosis-driven (or an attendance HRG in outpatients), and length of stay is zero days.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Changes made to logic

The “empty core” (**RN97Z**) HRG has been amended to only be generated where length of stay is zero days. To reflect this change, the label has been amended to **RN97Z Same Day Nuclear Medicine Admission or Attendance**.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

Within this subchapter new code ***W92.7 Radiation synovectomy*** has been mapped to base HRG root **RN50 Radiation Synovectomy** to reflect that this HRG is specific to this procedure.

Subchapter SA – Haematological Procedures and Disorders

Subchapter **SA Haematological Procedures and Disorders** covers procedures for patients of all ages and adult diagnoses relating to haematological conditions. It includes activity undertaken in inpatient, day case and non-admitted care settings.

There are HRG roots specific to blood and bone marrow transplantation, including peripheral blood stem cell transplant HRGs that are now differentiated on donor type to match the equivalent bone marrow transplant HRGs. All of the blood and bone marrow transplantation HRG roots include age splits to separate paediatric activity from adult activity.

There are also HRGs specific to blood transfusion and diagnostic extraction of blood or marrow procedures.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**104**	**104**
Total HRG Roots	**41**	**41**
Procedure-driven HRGs	33	33
Diagnosis-driven HRGs	72	72
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

*Includes one hybrid HRG, which is driven by either procedure or diagnosis

There is one HRG, **SA11Z Thalassaemia**, that can be reached by both procedure and diagnosis codes. When a procedure indicating a blood transfusion has taken place, the primary diagnosis of thalassaemia takes precedence over the transfusion procedure for grouping purposes.

HRG **SA33Z Diagnostic Bone Marrow Extraction** and HRGs **SA41Z Automated Red Cell Exchange** to **SA45* Injection of Rh Immune Globulin or Other Blood Transfusion** inclusively employ maximum length of stay logic to ensure that minor procedures, such as a blood transfusion, are not used to determine the HRG for a long-stay medical patient, e.g. a child who has sickle-cell anaemia.

Interactive CC splits are employed within the majority of adult haematological disorder HRG roots within this subchapter – up to a maximum of six levels – to more appropriately differentiate expected resource usage between routine and complex patients.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis and procedure hierarchies reviews respectively, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter SB – Chemotherapy

Subchapter **SB Chemotherapy** covers both the procurement and delivery of chemotherapy regimens for patients of all ages. All but one of the HRGs in this subchapter are unbundled. This subchapter includes activity undertaken in inpatient, day case and non-admitted care settings.

There are chemotherapy procurement and delivery HRGs within this Subchapter.

The chemotherapy procurement HRGs are categorised by bands for the procurement of drugs, with band 1 having the lowest expected cost (£0 to £200) and band 10 having the highest expected cost (£1,801 upwards).

These bands are derived from a national list owned by NHS England. In addition, there is a catch-all HRG for the procurement of drugs not on said list.

There are HRGs specific to chemotherapy delivery, distinguished by type, e.g. oral, intravenous etc.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**18***	**18***
Total HRG Roots	**18**	**18**
Procedure-driven HRGs	18	18
Diagnosis-driven HRGs	1	1
Age Splits	No	No
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	Yes	Yes

*Includes one core HRG (**SB97Z**) that is driven by both diagnosis and procedure logic for admitted patient care and by procedure only for non-admitted patients.

There is one HRG, **SB97Z Same Day Chemotherapy Admission or Attendance**, that has been created as an “empty core” HRG, as it would be expected that all the resources associated with these patients would be included within the unbundled chemotherapy HRGs.

The specific logic required to derive the HRG root **SB97 Same Day Chemotherapy Admission or Attendance** requires a length of stay of zero days, and either a delivery or procurement of chemotherapy procedure code, or a secondary diagnosis of ***Z51.1 Chemotherapy session***, and a lack of any other significant procedure code.

The chemotherapy HRGs are generated per cycle and the delivery HRGs per session, based on the OPCS-4 codes recorded.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Changes made to logic

Logic has been added to the “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, as this ICD-10 code is only to be used when a patient is solely admitted for this treatment. This means that the presence of ICD-10 code ***Z51.1 Chemotherapy session*** in the patient record is used as an indicator that the patient has had chemotherapy which has been not been coded using OPCS-4 codes.

Subchapter SB: Worked Examples: Regimens and Treatments

In Subchapter SB, HRGs are derived using the relevant Chemotherapy Procurement procedure codes and, where appropriate, Chemotherapy Delivery procedure codes.

Case 1: Inpatient Treatment

A soft tissue sarcoma patient receives Doxorubicin and Ifosfamide chemotherapy as an inpatient. This consists of doxorubicin treatment on day one, followed by 24 hours of Ifosfamide and Mesna continuous infusion. This is repeated every 21 days.

Coding

Primary Diagnosis: C49.9 Malignant neoplasm of connective and soft tissue, unspecified

X70.4 Procurement of drugs for chemotherapy for neoplasm for regimens in Band 4

HRG Output

Core HRG: HD40* Malignancy, of Bone or Connective Tissue

Unbundled HRG(s): SB04Z Procure Chemotherapy drugs for regimens in Band 4

Case 2: Daycase

A lymphoma patient is receiving ABVD chemotherapy. This consists of four drugs and is given every 14 days.

Coding

Primary Diagnosis: C81.9 Hodgkin's disease, Hodgkin's disease, unspecified

Cycle 1:

X70.2 Procurement of drugs for chemotherapy for neoplasm for regimens in Band 2

X72.2 Delivery of complex parenteral chemotherapy for neoplasm at first attendance

Repeat for attendance of each new cycle every 14 days

HRG Output

Core HRG: SB97Z Same day Chemotherapy admission or attendance

Unbundled HRG(s): SB02Z Procure Chemotherapy drugs for regimens in Band 2

SB13Z Deliver more Complex Parenteral Chemotherapy at First Attendance

Case 3: Ambulatory Patient

A breast cancer patient is receiving Trastuzumab 7 loading dose followed by Trastuzumab 7 maintenance dose on a weekly basis. This is repeated every seven days.

Coding

Cycle 1: Trastuzumab 7 loading dose (1 attendance)

X70.5 Procurement of drugs for chemotherapy for neoplasm for regimens in Band 5

X72.3 Delivery of simple parenteral chemotherapy for neoplasm at first attendance

Cycle 2: Trastuzumab 7 maintenance dose (1 attendance)

X70.3 Procurement of drugs for chemotherapy for neoplasm for regimens in Band 3.

X72.3 Delivery of simple parenteral chemotherapy for neoplasm at first attendance

Do not use X72.4 Delivery of subsequent element of cycle of chemotherapy for neoplasm because the cycle length is seven days. These are classed as different cycles because they are different regimens.

HRG Output

HRG output is based on different cycles. For the 1 attendance of cycle 1, the grouper will output a procurement HRG and a delivery HRG. For the 1 attendance of cycle two, the grouper will again output both a procurement HRG and a delivery HRG.

1 attendance of cycle 1:

Core HRG: SB97Z Same day Chemotherapy admission or attendance

Unbundled HRG(s): SB05Z Procure Chemotherapy drugs for regimens in Band 5

SB12Z Deliver Simple Parenteral Chemotherapy at First Attendance

1 attendance of cycle 2:

Core HRG: SB97Z Same day Chemotherapy admission/attendance

Unbundled HRG(s): SB03Z Procure Chemotherapy drugs for regimens in Band 3

SB12Z Deliver Simple Parenteral Chemotherapy at First Attendance

Case 4: A regimen with inpatient and outpatient components

An inpatient receives BEP 5 day chemotherapy for a testicular solid tumour. The chemotherapy consists of three different drugs given over three inpatient days and the two consecutive outpatient treatments at seven day intervals. The whole cycle is repeated every 21 days.

Coding

Primary Diagnosis: C62.9 Malignant neoplasm of testis, unspecified

Cycle 1: Day 1 (Inpatient episode)

X70.3 Procurement of drugs for chemotherapy for neoplasm for regimens Band 3

HRG Output

Core HRG: LB35* Scrotum, Testis or Vas Deferens Disorders

Unbundled HRG: SB03Z Procure Chemotherapy drugs for regimens in Band 3

Day 8 (1 outpatient attendance)

X72.4 Delivery of subsequent element of cycle of chemotherapy for neoplasm.

HRG Output

Core HRG: SB97Z Same day Chemotherapy admission or attendance

Unbundled HRG: SB15Z Deliver subsequent elements of a Chemotherapy cycle

Day 15 (2nd outpatient attendance)

X72.4 Delivery of subsequent element of cycle of chemotherapy for neoplasm

HRG Output

Core HRG: SB97Z Same day Chemotherapy admission or attendance

Unbundled HRG: SB15Z Deliver subsequent elements of a Chemotherapy cycle

Cycle 2

Day 21 (Inpatient episode)

X70.3 Procurement of drugs for chemotherapy for neoplasm for regimens Band 3

HRG Output

Core HRG: LB35* Scrotum, Testis or Vas Deferens Disorders

Unbundled HRG: SB03Z Procure Chemotherapy drugs for regimens in Band 3

Case 5: Outpatient treatment with a subsequent element

A lung cancer patient is receiving Carboplatin + Vinorelbine chemotherapy as an outpatient. This consists of one day of treatment with Vinorelbine and carboplatin both IV. This is followed seven days later by Vinorelbine therapy oral. The cycle is repeated every 21 days.

Coding

Day 1 (1 outpatient attendance)

X70.3 Procurement of drugs for chemotherapy for neoplasms for regimens in Band 3

X72.3 Delivery of simple parenteral chemotherapy for neoplasm at first attendance

HRG Output

Core HRG: SB97Z Same day Chemotherapy admission or attendance

Unbundled HRGs: SB03Z Procure Chemotherapy drugs for regimens in Band 4

SB12Z Deliver Simple Parenteral Chemotherapy at First Attendance

Day 8 (2nd outpatient attendance)

X72.4 Delivery of subsequent element of cycle of chemotherapy for neoplasm

HRG Output

Core HRG: SB97Z Same day Chemotherapy admission or attendance

Unbundled HRG: SB15Z Deliver subsequent elements of a Chemotherapy cycle

Subchapter SC – Radiotherapy

Subchapter **SC Radiotherapy** covers both the preparation and delivery of radiotherapy for patients of all ages.

All but one of the HRGs in this subchapter are unbundled. This subchapter includes activity undertaken in inpatient, day case and non-admitted care settings.

HRGs for Radiotherapy include one set for pre-treatment (planning) processes and one set for treatment delivered, with a separate HRG being allocated for each fraction delivered.

The planning HRGs are intended to cover all attendances required for completion of the planning process. It is not intended that individual attendances for parts of this process will be recorded separately.

The planning HRGs do not include the consultation at which the patient consents to radiotherapy, nor do they cover any outpatient attendance for medical review required by any change in status of the patient.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**30***	**30***
Total HRG Roots	**30**	**30**
Procedure-driven HRGs	30	30
Diagnosis-driven HRGs	1	1
Age Splits	No	No
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	Yes	Yes

*Includes one core HRG (**SC97Z**) that is driven by both diagnosis and procedure logic for admitted patient care and by procedure only for non-admitted patients.

Radiotherapy HRGs are driven by OPCS-4 codes and the majority have a direct mapping. The logic relies on the coding of a secondary procedure to indicate delivery of a fraction using a megavoltage or orthovoltage machine and whether technical support was required

To reflect activity for patients that are admitted solely for the delivery of External Beam Radiotherapy as a Day Case episode or Outpatient attendance, an “empty core” HRG of **SC97Z Same Day External Beam Radiotherapy Admission or Attendance** is output as well as the unbundled external beam radiotherapy HRGs.

The specific logic required to derive the HRG **SC97Z Same Day Radiotherapy Admission or Attendance (excluding Brachytherapy)** requires a length of stay of zero days, and either a procedure code for the delivery of external beam radiotherapy or a secondary diagnosis of ***Z51.0 Radiotherapy session***, and a lack of any other significant procedure code.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Changes made to logic

Logic has been added to the “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, as this ICD-10 code is only to be used when a patient is solely admitted

for this treatment. This means that the presence of ICD-10 code ***Z51.0 Radiotherapy session*** in the patient record is used as an indicator that the patient has had radiotherapy which has been not been coded using OPCS-4 codes.

Subchapter SC: Outpatient Example

Cases A to **E** illustrate the five fraction course of Total body irradiation (TBI) of a patient diagnosed as having Hodgkin's lymphoma prior to a bone marrow transplant. The TBI is planned and the first treatment is given immediately afterwards (same attendance):

Case	Attendance	Dominant Procedure (OPCS-4)	Other Procedures (OPCS-4)	HRG4+
A	1 attendance	X67.2 Preparation for total body irradiation	X65.1 Delivery of a fraction of total body irradiation (TBI)	*SC97Z* *Same Day External Beam Radiotherapy Admission or Attendance* + SC42Z Preparation for Total Body Irradiation + SC25Z Deliver a fraction of Total Body irradiation
B	2nd attendance	X65.1 Delivery of a fraction of total body irradiation (TBI)		*SC97Z* *Same Day External Beam Radiotherapy Admission or Attendance* + SC25Z Deliver a fraction of Total Body irradiation
C	3rd attendance	X65.1 Delivery of a fraction of total body irradiation (TBI)		*SC97Z* *Same Day External Beam Radiotherapy Admission or Attendance* + SC25Z Deliver a fraction of Total Body irradiation
D	4th attendance	X65.1 Delivery of a fraction of total body irradiation (TBI)		*SC97Z* *Same Day External Beam Radiotherapy Admission or Attendance* + SC25Z Deliver a fraction of Total Body irradiation
E	5th attendance	X65.1 Delivery of a fraction of total body irradiation (TBI)		*SC97Z* *Same Day External Beam Radiotherapy Admission or Attendance* + SC25Z Deliver a fraction of Total Body irradiation

Subchapter SC: Inpatient Example

Case F highlights a patient who is diagnosed with malignant neoplasm of breast and undergoes total mastectomy, followed by radiotherapy treatment delivered as part of the inpatient episode:

Case	Age	Length of Stay (days)	Primary Diagnosis (ICD-10)		Dominant Procedure (OPCS-4)		Other Procedures (OPCS-4)		HRG4+	
F	32	2	C50.9	Malignant neoplasm of breast, unspecified	B27.4	Total mastectomy	X67.4 + X65.8 + Y91.2	Volume definition for simple radiotherapy with imaging and dosimetry + Other specified radiotherapy delivery + Delivery of a fraction of simple radiotherapy on a megavoltage machine	*JA20F* + SC45Z + SC22Z	*Unilateral Major Breast Procedures with CC Score 0-2* + Preparation for simple radiotherapy with imaging and dosimetry + Deliver a fraction of treatment on a megavoltage machine

Subchapter SD – Specialist Palliative Care

Subchapter **SD Specialist Palliative Care** relates to care in which the clinical intent or treatment goal is primarily to improve the quality of life of a patient with an active, progressive disease with little or no prospect of cure. This subchapter covers both adult and paediatric activity.

Specialist palliative care (SPC) is usually evidenced by an interdisciplinary assessment and/or management of the physical, psychological, emotional and spiritual needs of the patient, and a grief and bereavement support service for the patient and their carers/family.

SPC includes care provided under the principal clinical management of a SPC medicine consultant, either in a Palliative Care unit or in a designated Palliative Care programme. It can be delivered by NHS, voluntary sector and other accredited providers.

Subchapter SD comprises:

- Specialist support services delivered to inpatients
- Outpatients, day therapy assessments and interventions for inpatients and day cases

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	10	10
Total HRG Roots	5	5
Procedure-driven HRGs	N/A	N/A
Diagnosis-driven HRGs	N/A	N/A
Age Splits	No	No
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

In the table above, it can be seen that diagnoses do not drive these HRGs. The main driver for these HRGs is a combination of Treatment Function Codes and Main Specialty Codes.

However, it should be noted that diagnoses are used in the subchapter-specific grouping logic, in conjunction with length of stay and age, when determining the HRG.

For further information of how this logic works, please refer to the subchapter-specific grouping logic section of this document. For information on data input and processing, please refer to the Grouper User Manual.

The services provided by palliative care specialists include the following:

- Clinical consultancy/care
- Personal care
- Spiritual/emotional support/counselling
- Home care/support
- Education
- Case management/care coordination

If an inpatient is not admitted under the care of a specialist palliative medicine consultant but is receiving support from a member of a SPC Team, this is classed as SPC Support.

The following specialist palliative care is not covered in HRG4+:

- General palliative care
- Community specialist palliative care
- Bereavement care as a separate HRG. However, some bereavement care costs are expected to be included within the costs covered by other HRGs. Bereavement costs

that are to be included in HRG costs are detailed in the Service Level Agreements, drafted by the National Partnership Group for Palliative Care
- Patients admitted for holiday relief/respite

SPC HRGs are classed as unbundled activity. Unbundled HRG grouping is the second stage of the grouping process, occurring immediately after the data have been validated. After the relevant activity has been unbundled from the data, multiple trauma, burns and core HRGs are produced.

For inpatient specialist palliative care (not day cases or specialist palliative care support), SPC HRGs are generated on a per diem basis for the entire SPC consultant episode. The grouper generates these in addition to the core HRG, based on the number of SPC days recorded in the CDS.

For day case specialist palliative care, a single SPC HRG is generated, plus a core HRG.

For non-admitted care, HRGs have been defined for both medical and non-medical specialist palliative care attendances. For non-admitted attendances, the grouper allocates an appropriate SPC HRG, plus a core HRG, which may be a default core HRG from Subchapter **WF Non-Admitted Care Consultations** if no significant procedure has been recorded.

It should be noted that root HRG SD03 (Hospital Specialist Palliative Care Support) is NOT generated per diem, but rather identifies that specialist palliative care support has been provided. The SPC days as recorded in the CDS should not be used to reflect 'instances' of specialist palliative care support delivery, as this will inappropriately reduce the length of stay of the core HRG for the episode / spell.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter SD: Specialised Palliative Care HRGs Explained by Setting

Inpatient SPC HRGs:

HRG	Label	Definition	Notes
SD01A	Inpatient Specialist Palliative Care, 19 years and over	Age = 19 years and over **AND** Main Specialty Code = 315 (Palliative Medicine) **AND** Treatment Function Code = 315 (Palliative Medicine) **AND** Length of Stay > 0 **OR** Discharge Method = 4 (Patient Died) **AND** Secondary Diagnosis (ICD-10)= Z51.5 (Palliative Care) **AND NOT** Primary Diagnosis (ICD-10) = Z75.5 (Holiday Relief Care)	Adult inpatients under the care of a specialist palliative medicine consultant, excluding patients discharged on the day of admission (unless they die on the day of admission), excluding patients admitted for respite care [[Note: Requires SPC days CDS field to be populated to indicate duration of specialist palliative care and produce multiple unbundled HRGs accordingly]
SD01B	Inpatient Specialist Palliative Care, 18 years and under	As above with: Age = 18 years and under	Paediatric inpatients under the care of a specialist palliative medicine consultant , excluding patients discharged on the day of admission (unless they die on the day of admission), excluding patients admitted for respite care [Note: Requires SPC days CDS field to be populated to indicate duration of specialist palliative care and produce multiple unbundled HRGs accordingly]
SD02A	Inpatient Specialist Palliative Care, Same Day, 19 years and over	Age = 19 years and over **AND** Main Specialty Code = 315 (Palliative Medicine) **AND** Treatment Function Code = 315 (Palliative Medicine) **AND** Length of Stay = 0 **AND** Discharge Method ≠ 4 (Patient did not die) **AND** Secondary Diagnosis (ICD-10)= Z51.5 Palliative care **AND NOT** Primary Diagnosis (ICD-10) = Z75.5 Holiday relief care	[Note: a maximum of 1 SPC unbundled HRG will be generated, in addition to the core HRG, irrespective of SPC days recorded in the CDS]
SD02B	Inpatient Specialist Palliative Care, Same Day, 18 years and under	As above with: Age = 18 years and under	[Note: a maximum of 1 SPC unbundled HRG will be generated, in addition to the core HRG, irrespective of SPC days recorded in the CDS]

HRG	Label	Definition	Notes
SD03A	Hospital Specialist Palliative Care Support, 19 years and over	Age = 19 years and over **AND** Secondary Diagnosis (ICD-10)= Z51.5 Palliative care **AND NOT** Main Specialty Code = 315 (Palliative Medicine)	Adult inpatients not under the care of a specialist palliative medicine consultant but receiving input from a specialist palliative care specialist support service [Note: SPC days should not be recorded in the CDS]
SD03B	Hospital Specialist Palliative Care Support, 18 years and under	As above with: Age = 18 years and under	Paediatric inpatients not under the care of a specialist palliative medicine consultant but receiving input from a specialist palliative care specialist support service [Note: SPC days should not be recorded in the CDS]

Outpatient, Day Therapy Assessment and Intervention HRGs

HRG	Label	Definition
SD04A	Medical Specialist Palliative Care Attendance, 19 years and over	Age = 19 years and over **AND** Main Specialty Code = 315 (Palliative Medicine) **AND** Treatment Function Code = 315 (Palliative Medicine)
SD04B	Medical Specialist Palliative Care Attendance, 18 years and under	As above with: Age = 18 years and under
SD05A	Non-Medical Specialist Palliative Care Attendance, 19 years and over	Age = 19 years and over **AND** Main Specialty Code = 950 (Nursing Episode) **OR** 960 (Allied Health Profession Episode) **AND** Treatment Function Code = 315 (Palliative Medicine)
SD05B	Non-Medical Specialist Palliative Care Attendance, 18 years and under	As above with: Age = 18 years and under

The Outpatient Attendance Commissioning data set (CDS) can record contacts by medical, nursing and allied health professionals (AHPs), including physiotherapists, speech and language therapists, occupational therapists, podiatrists, dieticians and clinical psychologists. Chaplains and Social Workers may also record contacts as AHPs.

Subchapter UZ – Undefined Groups

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	1	1
Total HRG Roots	1	1
Procedure-driven HRGs	N/A	N/A
Diagnosis-driven HRGs	N/A	N/A

The single HRG in Subchapter **UZ Undefined Groups** is generated where a patient record is not valid for grouping to one of the other subchapters.

There is only one HRG in this subchapter, **UZ01Z Data Invalid for Grouping**.

This subchapter is intended to help an organisation identify invalid data and take action, for example, to understand whether clinical coding errors are due to lack of information specificity or unavailability of information at the time of the coding.

Subchapter UZ is comprised of 11 underlying U Error categories that lead to the assignment of HRG **UZ01Z Data Invalid for Grouping**.

These are as follows:

- **UZ01 Invalid Primary Diagnosis:**
  - The primary diagnosis is blank
  - The primary diagnosis ICD-10 code cannot be used in the primary position
- **UZ02 Poorly Coded Primary Diagnosis:**
  - The diagnosis ICD-10 code exists and is valid in the primary position, but it is so unspecific that the resource use cannot be defined
- **UZ03 Age Conflicting with Diagnosis**
- **UZ04 Diagnosis conflicting with anatomical sites:**
  - The ICD-10 anatomical site code, specified at the 5th digit level, conflicts with the diagnosis in the record
- **UZ05 Invalid procedure for Casemix grouping purposes**
- **UZ06 Poorly coded procedure for Casemix grouping purposes**
- **UZ11 Neonatal Critical Care Error**
- **UZ13 Adult Critical Care Error**
- **UZ14 Renal (NRD) Error**
- **UZ15 Burns Error**
  - Burns primary diagnosis code of unspecified body region or with no subsequent total body surface area (TBSA) code
- **UZ21 CCAC Inappropriate for NCC**

The grouping software ensures that the data are complete, valid and within expected value ranges. The software applies the following three stages of validation to the data during a processing run:

- Field content within record
- Cross validation of episodes within spell
- Grouping logic (assignment of flag values)

Where the HRG4+ Grouper cannot assign a valid HRG, **UZ01Z Data invalid for grouping** is returned in the output record, signifying that the record is unclassified.

If there are errors in the input data, these will be reported in the **data quality report**, as part of the Grouper output files, but processing will not be halted. There can be more than one reason for non-assignment of an HRG, so there may be more than one data quality message for each data row, all of which need to be reviewed to identify the underlying problem(s).

UZ01 Invalid Primary Diagnosis
This error indicates that there is an error with the primary diagnosis code.

UZ02 Poorly Coded Primary Diagnosis

This error is generated where a diagnosis code exists and is valid as a primary diagnosis but is too vague to determine resource use in HRG terms.

UZ03 Diagnosis Conflicts with Age
This error indicates that a paediatric-specific diagnosis (according to national coding rules) has been recorded for an adult patient (age 19 years and over).

UZ04 Diagnosis Conflicts with Anatomical Site
This error indicates that an invalid combination of diagnosis and anatomical site has been input. This only applies to specific musculoskeletal codes entered at ICD-10 5th digit level.

UZ05 Invalid procedure for Casemix grouping purposes
This error is reported if the OPCS-4 code with the highest procedure hierarchy in the record is a valid OPCS-4 code but is not valid for grouping, for example, if the code represents a “conversion from” code in orthopaedic surgery.

UZ06 Poorly coded procedure for Casemix grouping purposes
This error indicates that a procedure code is valid as a dominant procedure but is insufficiently specific to determine the resource use from an HRG design perspective, e.g. OPCS-code **X45.9 Unspecified donation of organ**.

UZ11 Neonatal Critical Care Error
This is a general error for neonatal critical care and is generated when conditions in the grouping algorithm have not been met.

UZ13 ACC Grouping Error
This is a general error for adult critical care and is generated when conditions in the grouping algorithm have not been met.

UZ14 Renal (NRD) Error
This is a general error for grouping renal activity using the national renal data set and is generated when conditions in the grouping algorithm have not been met.

UZ15 Burns Error

This error is produced when a burns primary diagnosis code of unspecified body region or total body surface area (TBSA) is recorded, or a burns diagnosis code is recorded in any position, with no subsequent TBSA code present. Failure to record TBSA contravenes national coding rules.

UZ21 CCAC Inappropriate in NCC
Certain critical care activity codes (CCAC) are not valid for neonatal critical care (NCC) grouping or are valid only when used in combination with other codes. UZ21 is generated when the CCAC or combination of codes in the input record is not appropriate for the derivation of a NCC HRG.

Further information regarding the underlying U categories can be found in the “**Group to Split**” tab within the **Code to Group** spreadsheet

Field Validation Errors

All clinical codes are validated against the Grouper's internal database of codes. Clinical codes in the patient record that are not on this list will result in the generation of a **UZ01Z** HRG.

- Diagnosis (ICD-10) codes that are not on the list are classified as invalid. These will not result in a specific error message but will be output in the Data Quality report as follows:

  ICD|XXXX|Diagnosis Code is invalid in DIAG_XX

- Procedure (OPCS-4) codes that are not on the list are similarly classified as invalid. However, these will not result in a specific error message but will be output in the Data Quality report as follows:

  OPCS|XXXX|Procedure code is invalid in OPER_XX

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

OPCS-4 codes ***V02.8 Other specified other plastic repair of cranium*** and ***V02.9 Unspecified other plastic repair*** of have been remapped from base HRG root **AA53 Major Intracranial Procedures** and ***F15.8 Other specified other orthodontic operations*** from base HRG root **CD03 Minor Dental Procedures** to U Error category **UZ06 Poorly coded procedure for Casemix grouping purposes** as these are .8 Other specified and .9 Unspecified codes from extended categories and as such, coding rules state they should not be used.

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** from U Error category **UZ03 Age Conflicting with Diagnosis**. This reflects the fact that these codes do not conflict with age; rather they are not allowed to be used in the primary position for patients who are not stillborn.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

Within this subchapter eight new approach and site codes have been mapped to U Error category **UZ05 Invalid procedure for Casemix grouping purposes**, to reflect that these codes should only be used subsidiary to a procedure code from a main body system chapter.

In addition, 28 new ***.8 Other specified*** and ***.9 Unspecified*** codes and retired code ***M06.4 Code retired - refer to introduction*** have been authored, which are within extended categories, and as coding rules state that these should not be used, these have been mapped to U Error category **UZ06 Poorly coded procedure for Casemix grouping purposes**.

Subchapter VA – Multiple Trauma

Subchapter **VA Multiple Trauma** covers high resource, complex diagnoses and treatments associated with multiple trauma cases for patients of all ages. In the HRG4+ design, multiple trauma is determined by the presence of significant simultaneous traumatic injuries involving more than one body area.

Traumatic single injuries are addressed elsewhere within the relevant body system subchapters.

This subchapter includes activity undertaken in inpatient and day case settings.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**24**	**24**
Total HRG Roots	**6**	**6**
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	24	24
Age Splits	No	No
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Following validation and unbundling, multiple trauma grouping takes precedence over any other grouping logic that might otherwise be applied across the episode or spell, via Core4 grouping logic. The multiple trauma logic is made up of the following elements:

- For single episode spells, where the episode HRG is multiple trauma, the HRG of the spell will be the same multiple trauma HRG
- A multiple trauma spell HRG will be generated where the HRG of the first episode of a multi-episode spell is multiple trauma. The multiple trauma HRG of the first episode, that of any later episode(s) and that of the spell may be different because of the additive nature of the logic employed
- For multi-episode spells where the first episode is not multiple trauma but a later episode is multiple trauma, the spell HRG will not be multiple trauma.

All multiple trauma HRGs require at least two diagnosis codes (one primary) relating to more than one body site. The trauma diagnoses are listed under nine body sites:

- Abdominal trauma diagnoses
- Chest trauma diagnoses
- Head trauma diagnoses
- Kidney trauma diagnoses
- Lower limb trauma diagnoses
- Other trauma diagnoses
- Pelvis or spine trauma diagnoses
- Upper limb trauma diagnoses
- Urinary trauma diagnoses

The table of non-superficial trauma injuries relating to these specific body sites can be found in the “**VA_cmpt_*”** lists in the “Other Lists” tab of the Code to Group Excel workbook.

If a patient has trauma diagnoses for two or more body sites within an episode, this will generate a multiple trauma HRG for that episode.

This subchapter employs grid logic, which is able to take into account multiple procedures as well as multiple diagnoses. This accurately reflects the complexity involved in treating patients that have multiple traumatic injuries. Each relevant procedure and diagnosis has been assigned a score ranging from 3 to 15. To determine which multiple trauma HRG is derived, the score of all relevant procedure and all relevant diagnosis codes recorded in the patient record are totalled, respectively, to determine a procedure score and a diagnosis score. This pair of scores determines which HRG is derived.

The following grid provides the scoring logic used and shows which HRG would be produced from a given pair of scores.

HRG Derivation Grid:

Procedure score => Diagnosis score	0	1 - 8	9 – 18	19 - 29	30 - 44	>=45
<=23	VA10A	VA11A	VA12A	VA13A	VA14A	VA15A
24 – 32	VA10B	VA11B	VA12B	VA13B	VA14B	VA15B
33 – 50	VA10C	VA11C	VA12C	VA13C	VA14C	VA15C
>=51	VA10D	VA11D	VA12D	VA13D	VA14D	VA15D

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Changes made to logic

A review of multiple trauma logic has been undertaken with the Expert Working Group, which has resulted in:

- The removal of several non-specific and/or superficial injury codes from Core4 multiple trauma logic and lists (i.e. they will no longer drive grouping to a multiple trauma HRG), as they are not indicative of major trauma, e.g. ***T11.0 Superficial injury of upper limb, level unspecified***
- The removal of several procedures from Core4 multiple trauma logic and/or lists (i.e. they will no longer contribute to multiple trauma procedure scores), as they are not considered procedures that would be undertaken for the care of multiple trauma patients e.g. ***A73.5 Injection of therapeutic substance around peripheral nerve***
- The multiple trauma lists, **MT_OPCS_Value** and **MT_ICD_Value**, code values have been amended to be scaled based on the revised procedure and diagnosis hierarchies, respectively. This is to more appropriately reflect current expected resource use for these procedure and diagnosis codes, whilst retaining the multiple trauma value and score ranges.
- Paired code combinations created as a result of the OPCS-4 paired code review have also been added into the multiple trauma design taking into account that the paired codes effectively represent two procedures.
- Non-body-site-specific OPCS-4 codes now require a site qualifier to be duly recognised when determining multiple trauma procedure scoring. E.g. new OPCS-4.8 code ***O17.6 Remanipulation of fracture of bone and fixation using plate*** (see below) only has an ***MT_OPCS_Value*** when used in conjunction with a site code from

respective lists indicating a site of Hip, Knee, Shoulder, Elbow, Hand or Foot. This change is intended to improve the recording of OPCS-4 site codes with Subchapter **VA Multiple Trauma**.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

The new orthopaedic site combinations created from new OPCS-4.8 codes ***O17.6 Remanipulation of fracture of bone and fixation using plate*** and ***W24.7 Closed reduction of fracture of bone and fixation using plate*** have been added to the multiple trauma logic.

Subchapter VB – Emergency Medicine

Subchapter **VB Emergency Medicine** covers activity for patients of all ages treated within the following types of emergency departments:

Type 01
Emergency Departments: Consultant-led 24 hour service with full resuscitation facilities and designated accommodation for the reception of accident and emergency patients

Type 02
Consultant-led mono-specialty accident and emergency service (e.g. ophthalmology, dental) with designated accommodation for the reception of patients, with the exception of gynaecology casualty departments

Type 03
Other types of units with designated accommodation for the reception of minor accident and emergency patients, including other open access treatment services offering at least minor injury/illness services, whether located alongside a main A&E department or at another location

Type 04
NHS walk-in centres

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	12	12
Total HRG Roots	12	12
Procedure-driven HRGs	N/A	N/A
Diagnosis-driven HRGs	N/A	N/A
Age Splits	No	No
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

The HRGs within Subchapter **VB Emergency Medicine** are split into ten levels of complexity based on a combination of investigation and treatment categories. There are also HRGs specific to emergency dental care and to patients that are dead on arrival. The Emergency Medicine HRGs do not cover activity within clinical decision units and observation-type wards/units.

Emergency Medicine HRGs

HRG	HRG Label
VB01Z	Emergency Medicine, Any Investigation with Category 5 Treatment
VB02Z	Emergency Medicine, Category 3 Investigation with Category 4 Treatment
VB03Z	Emergency Medicine, Category 3 Investigation with Category 1-3 Treatment
VB04Z	Emergency Medicine, Category 2 Investigation with Category 4 Treatment
VB05Z	Emergency Medicine, Category 2 Investigation with Category 3 Treatment
VB06Z	Emergency Medicine, Category 1 Investigation with Category 3-4 Treatment
VB07Z	Emergency Medicine, Category 2 Investigation with Category 2 Treatment
VB08Z	Emergency Medicine, Category 2 Investigation with Category 1 Treatment
VB09Z	Emergency Medicine, Category 1 Investigation with Category 1-2 Treatment
VB10Z	Emergency Medicine, Dental Care
VB11Z	Emergency Medicine, No Investigation with No Significant Treatment
VB99Z	Emergency Medicine, Patient Dead On Arrival

In Subchapter VB, the HRG assigned depends on the investigations and treatments recorded within the A&E Commissioning Data Set (CDS 110). The HRG assigned to each attendance depends on the dominant investigation and dominant treatment and their respective categories of care.

Grouping for each attendance works as follows:

1. Each **treatment** and **investigation** on the attendance record has an associated hierarchy (See Appendix A for investigations and Appendix B for treatments).
2. This hierarchy information determines the dominant treatment and dominant investigation for the record, and thereby the categories of both.
3. Combining the Investigation and Treatment categories of care will result in the most resource-intensive HRG being generated, subject to the Grouping Exceptions identified below.

Records with neither an Investigation nor Treatment Code recorded will generate the UZ01Z HRG. Where there is no Investigation Code recorded, the patient record will group based upon the appropriate Treatment code.

The hierarchies presented in Appendices A and B are fundamental to which investigations and treatments are considered dominant and used for HRG derivation.

Grouping Exceptions

When determining the HRG assigned to each investigation and treatment, there are certain exceptions where the category is one of two possible values.

* If the dominant investigation is “None” (Investigation code 24) or blank and the dominant treatment is from the following list, the HRG assigned will be **VB11Z**. Otherwise these treatments will be considered as category 1 and the HRG derived will be dependent on the category value of the dominant investigation code.

Treatment Code	Treatment Code Label	Treatment Category (5=highest; 1=lowest)
12	Intravenous cannula	1 or 0 *
221	Guidance/advice only – written	1 or 0 *
222	Guidance/advice only – verbal	1 or 0 *
241	Tetanus – immune	1 or 0 *
99	None (consider guidance/advice option)	1 or 0 *

* For treatments shown below, the following HRG rules apply depending on the dominant investigation

Dominant Treatment	Category of Dominant Investigation	HRG
031 Primary sutures (Cat. 3 or 4) 032 Secondary/complex suture (Cat. 3 or 4) 17 Urinary catheter/suprapubic (Cat. 3 or 4) 235 Anaesthesia–sedation (Cat. 3 or 4) 512 Medication administered – intra-muscular (Cat. 3 or 4) 515 Medication administered–sublingual (Cat. 3 or 4)	Category 1 or blank	VB06Z (Emergency Medicine, Category 1 Investigation with Category 3-4 Treatment)
	Category 2	VB05Z (Emergency Medicine, Category 2 Investigation with Category 3 Treatment)
	Category 3	VB02Z (Emergency Medicine, Category 3 Investigation with Category 4 Treatment)

Patient Dead on Arrival HRG

HRG **VB99Z Emergency Medicine, Patient Dead On Arrival** has been created within this Subchapter for patients that are dead on arrival (DOA). This HRG is derived from a value of 70 (brought in dead) in the data item *A&E Patient Group*. This HRG will be derived in preference to any other HRGs within this subchapter, where the relevant value is present.

The table below shows all valid codes for A&E Patient Group:

Code	Treatment
10	Road Traffic Accident
20	Assault
30	Deliberate Self-Harm
40	Sports Injury
50	Fireworks Injury
60	Other Accident
70	Brought In Dead
80	Other Than Above

Where no Investigation or Treatment code is recorded, patient records with a value of 70 brought in dead in the data item A&E Patient Group will generate a UZ01Z HRG.

Dental Care HRG

HRG **VB10Z Emergency Medicine, Dental Care** has been created within this subchapter to identify a specific cohort of patients that seek emergency care for dental treatment only. The table below identifies the combination of Investigations and Treatments that will map to HRG **VB10Z**, based around the Investigation code “22” (Dental Investigation) and/or Treatment code “56” (Dental Treatment):

Inv. Code	Investigation Description	Treat. Code	Treatment Description
01	X-ray plain film	56	Dental Treatment
22	Dental investigation	56	Dental Treatment
24	None	56	Dental Treatment
99	Other	56	Dental Treatment
22	Dental investigation	57	Prescription\medicines prepared to take away
22	Dental investigation	99	None (consider guidance/advice option)

To note, HRG **VB10Z** will be derived in preference to any other HRGs within this subchapter, if the above combinations only are recorded in the patient record.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter VB: Appendix A – List of Investigations (with category and hierarchy value) used in the A&E CDS and required for HRG4+ derivation

Investigation Code	Investigation Code Label	Category (3=highest; 1= lowest)	Hierarchy (7=highest; 1=lowest)
01	X-ray plain film	2	6
02	Electrocardiogram	1	3
03	Haematology	2	6
04	Cross match blood/group and save serum for later cross match	2	6
05	Biochemistry	1	5
06	Urinalysis	1	3
07	Bacteriology	2	6
08	Histology	2	6
10	Ultrasound	3	7
11	Magnetic Resonance Imaging	3	7
12	Computerised Tomography (excludes genito urinary contrast examination/tomography)	3	7
13	Genito urinary contrast examination/tomography	3	7
14	Clotting studies	2	6
15	Immunology	2	6
16	Cardiac enzymes	2	6
17	Arterial/capillary blood gas	1	4
18	Toxicology	2	6
19	Blood culture	2	6
20	Serology	2	6
21	Pregnancy test	1	3
22	Dental investigation	2	2
23	Refraction, orthoptic tests and computerised visual fields	2	6
24	None	1 or 0 *	1
99	Other	1	3

The hierarchies presented in Appendix A above are fundamental to determining which investigation is considered dominant and used for HRG derivation.

Subchapter VB: Appendix B – List of Treatments (with category and hierarchy value) used in the A&E CDS and required for HRG4+ derivation

Treatment Code	Treatment Code Label	Category (5=highest; 1=lowest)	Hierarchy (8=highest; 1=lowest)
011	Dressing minor wound/burn/eye	2	4
012	Dressing major wound/burn/eye	3	5
02	Bandage/support	1	3
031	Primary sutures	3 or 4 *	6
032	Secondary/complex suture	3 or 4 *	6
033	Removal of sutures/clips	1	3
041	Wound closure – steristrips	2	4
042	Wound closure – wound glue	2	4
043	Wound closure – other (e.g. clips)	2	4
051	Application Plaster of Paris	2	4
052	Removal Plaster of Paris	1	3
06	Splint	2	4
08	Removal foreign body	3	5
091	Physiotherapy – strapping, ultra sound treatment, short wave diathermy, manipulation	2	4
092	Physiotherapy – gait re-education, falls prevention	2	4
101	Manipulation of upper limb fracture	4	7
102	Manipulation of lower limb fracture	4	7
103	Manipulation of dislocation	4	7
11	Incision & drainage	3	5
12	Intravenous cannula	1 or 0 *	2
13	Central line	3	5
14	Lavage/emesis/charcoal/eye irrigation	2	4
15	Intubation & Endotracheal tubes/laryngeal mask airways/rapid sequence induction	4	7
16	Chest drain	4	7
17	Urinary catheter/suprapubic	3 or 4 *	6
181	Defibrillation	4	7
182	External pacing	4	7
19	Resuscitation/cardiopulmonary resuscitation	5	8
20	Minor surgery	3	5
21	Observation/electrocardiogram, pulse oximetry/head injury/trends	1	3
221	Guidance/advice only – written	1 or 0 *	2
222	Guidance/advice only – verbal	1 or 0 *	2
231	Anaesthesia – general anaesthetic	4	7
232	Anaesthesia – local anaesthetic	2	4
233	Anaesthesia – regional block	2	4
234	Anaesthesia – entonox	2	4
235	Anaesthesia – sedation	3 or 4 *	6
236	Anaesthesia – other	2	4
241	Tetanus – immune	1 or 0 *	2
242	Tetanus – tetanus toxoid course	2	4
243	Tetanus – tetanus toxoid booster	2	4
244	Tetanus – human immunoglobulin	2	4
245	Tetanus – combined tetanus/diphtheria course	2	4
246	Tetanus – combined tetanus/diphtheria booster	2	4
25	Nebuliser/spacer	3	5

Treatment Code	Treatment Code Label	Category (5=highest; 1=lowest)	Hierarchy (8=highest; 1=lowest)
27	Other (consider alternatives)	1	3
281	Parenteral thrombolysis – streptokinase parenteral thrombolysis	4	7
282	Parenteral thrombolysis – recombinant – plasminogen activator	5	8
291	Other Parenteral drugs – intravenous drug, e.g. stat/bolus	4	7
292	Other Parenteral drugs – intravenous infusion	4	7
30	Recording vital signs	1	3
31	Burns review	1	3
32	Recall/x-ray review	1	3
33	Fracture review	1	3
34	Wound cleaning	1	3
35	Dressing/wound review	1	3
36	Sling/collar cuff/broad arm sling	1	3
37	Epistaxis control	2	4
38	Nasal airway	2	4
39	Oral airway	2	4
40	Supplemental oxygen	3	5
41	Continuous positive airways pressure/nasal intermittent positive pressure ventilation/bag valve mask	3	5
42	Arterial line	3	5
43	Infusion fluids	2	4
44	Blood product transfusion	4	7
45	Pericardiocentesis	4	7
46	Lumbar puncture	4	7
47	Joint aspiration	3	5
48	Minor plastic procedure/split skin graft	4	7
49	Active rewarming of the hypothermic patient	3	5
50	Cooling – control body temperature	1	3
511	Medication administered – oral	2	4
512	Medication administered – intra-muscular	3 or 4 *	6
513	Medication administered – subcutaneous	3	5
514	Medication administered – per rectum	2	4
515	Medication administered – sublingual	3 or 4 *	6
516	Medication administered – intra-nasal	2	4
517	Medication administered – eye drops	1	3
518	Medication administered – ear drops	1	3
519	Medication administered – topical skin cream	1	3
521	Occupational Therapy – OT functional assessment	3	5
522	Occupational Therapy – OT activities of daily living equipment provision	1	3
53	Loan of walking aid (crutches)	1	3
54	Social work intervention	3	5
551	Eye – orthoptic exercises	1	3
552	Eye – laser of retina/iris or posterior capsule	5	8
553	Eye – retrobulbar injection	3	5
554	Eye – epilation of lashes	3	5
555	Eye – subconjunctival injection	4	7
56	Dental treatment	2	2
57	Prescription\medicines prepared to take away	1	3

Treatment Code	Treatment Code Label	Category (5=highest; 1=lowest)	Hierarchy (8=highest; 1=lowest)
99	None (consider guidance/advice option)	1 or 0 *	1

Also note, the hierarchies presented in Appendix B are fundamental to determining which treatment is considered dominant and used for HRG derivation.

Subchapter VB: Worked Examples

The examples below show how the different Investigation codes and treatment codes are grouped in HRG4+

Case	Invest.1	Invest. 2	Treat. 1	Treat. 2	Dominant investigation	Dominant treatment	HRG4+
A	01-X-Ray (category 2)	02-Electro-cardiogram (category 1)	11-Incision & drainage (category 3)	511-Medication administered-oral (category 2)	01-X-ray (as category 2>1)	11-Incision & drainage (as category 3>2)	VB05Z Category 2 Investigation with Category 3 Treatment
B	01-X-Ray (category 2)	02-Electro-cardiogram (category 1)	282-Parenteral thrombolysis – recombinant – plasminogen activator (category 5)	99-None (consider guidance/advice option) (category 0 or 1)	01-X-ray (as category 2>1)	282-Parenteral thrombolysis – recombinant – plasminogen activator (as category 5>1 and 0)	VB01Z Any Investigation with Category 5 Treatment
C	22-Dental investigation	24-None	56-Dental treatment	99-None (consider guidance/advice option)	22-Dental investigation	56-Dental treatment	VB10Z Dental Care
D	24-None		56-Dental treatment	99-None (consider guidance/advice option)	24-None	56-Dental treatment	VB10Z Dental Care
E	22-Dental investigation	24-None	222-Guidance/advice only – verbal	99-None (consider guidance/advice option)	22-Dental investigation	222-Guidance/advice only – verbal	VB08Z Emergency Medicine, Category 2 Investigation with Category 1 Treatment
F	13-Genito urinary contrast examination/ tomography (category 3)	03-Haematology (category 2)	031-** Primary sutures (category 3 or 4)	511-Medication administered – oral (category 2)	13-Genito urinary contrast examination/ tomography (category 3)	031-Primary sutures	VB02Z Category 3 Investigation with Category 4 Treatment
G	05-Biochemistry (category 1)	24-None	17-Urinary catheter/suprapubic (category 3 or 4)	12-Intravenous cannula (category 0 or 1)	05-Biochemistry (category 1)	17-Urinary catheter/suprapubic	VB06Z Category 1 Investigation with Category 3-4 Treatment

** “Primary sutures” is considered category 4 in this example, as it is recorded with a category 3 dominant investigation, see page above for further detail

Subchapter VC – Rehabilitation

Subchapter **VC Rehabilitation** covers all activities relating to the assessment for, and the delivery of, rehabilitation for patients of all ages. It includes activity undertaken in inpatient, day case and non-admitted care settings.

Subchapter VC comprises:

- Assessment for rehabilitation
- Specific rehabilitation services for both inpatients and outpatients
- Rehabilitation services delivered to adults, children and older people
- Rehabilitation services delivered by the NHS and, potentially, other accredited providers

The Rehabilitation HRGs do not cover the following:

- Rehabilitation within an acute care treatment episode
- The identification of highly complex specialist rehabilitation

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**23**	**23**
Total HRG Roots	**23**	**23**
Procedure-driven HRGs	23	23
Diagnosis-driven HRGs	0	0
Age Splits	No	No
Complications and Comorbidities Splits	N/A	N/A
Intervention Splits	N/A	N/A
Multiple Procedures	N/A	N/A
Procedure Combination Codes	N/A	N/A
Diagnosis-qualified	N/A	N/A
Subsidiary Procedure-qualified	N/A	N/A
Length of Stay-qualified	N/A	N/A

The majority of Rehabilitation HRGs are unbundled on a per diem basis and are only generated where care is identified as taking place under a specialist rehabilitation consultant or within a discrete rehabilitation unit. They require the use of OPCS-4 codes **U50.-** to **U54.-** to generate a rehabilitation HRG, plus an appropriate duration of rehabilitative care to ensure that the HRGs are rightly generated on a per diem basis.

Rehabilitation assessment is identified by OPCS-4 code **X60.-**. A rehabilitation diagnosis code is not required to generate any of the three rehabilitation assessment HRGs, which are instance rather than duration-based, thus do not require a duration of rehabilitative care to be recorded.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter WD – Treatment of Mental Health Patients by Non-Mental Health Service Providers

Subchapter **WD Treatment of Mental Health Patients by Non-Mental Health Service Providers** covers the treatment of mental health patients by NHS organisations that do not provide specialist mental health services but do provide treatment to patients of all ages with a mental health primary diagnosis (and no significant procedure), prior to discharge or transfer to a specialist mental health provider.

Given that mental health services provided by specialist providers are captured using the mental health clustering classification, and recorded via the Mental Health Minimum Data Set, rather than the APC CDS, the HRGs within Subchapter WD effectively form the residue of treatment of mental health patients by non-specialist mental health service providers.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	9	9
Total HRG Roots	9	9
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	9	9
Age Splits	No	No
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

The HRGs are differentiated based on type of mental health disorder in line with ICD-10 diagnosis code definitions, and do not as yet unitise interactive CC splits or intervention splits.

Note that some treatments of patients younger than 19 years old with a primary mental health diagnosis are grouped to HRGs in Subchapter **PT Paediatric Mental Health Disorders**.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter, with the exception of the global diagnosis hierarchy review, have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter WF – Non-Admitted Consultations

Subchapter **WF Non-Admitted Consultations** covers non-admitted consultations, including outpatients and ward attenders, for patients of all ages.

Subchapter WF comprises:

- Unidisciplinary face-to-face first and follow-up attendances
- Multiprofessional face-to-face first and follow-up attendances
- Unidisciplinary non face-to-face first and follow-up attendances
- Multiprofessional non face-to-face first and follow-up attendances

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	8	8
Total HRG Roots	2	2
Procedure-driven HRGs	8	8
Diagnosis-driven HRGs	0	0
Age Splits	No	No
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Where significant procedures are coded in outpatient attendances, the appropriate procedure-driven HRG will be generated.

For outpatients or ward attenders, a significant procedure may not always be recorded. In these cases, activity is grouped to Subchapter WF, with the HRG derived based on the type of attendance (using the FIRST ATTENDANCE data item in the NHS Data Model and Dictionary), modified by the presence of the following OPCS-4 codes:

- **X62.2 Assessment by multi-professional team NEC**
- **X62.3 Assessment by multi-disciplinary team NEC**

The matrix below shows how the type of attendance and the presence of OPCS-4 codes for uni-professional or multi-professional assessments drive the derivation of the HRGs in this subchapter:

		Attendance Type*			
		1 First Attendance Face-to-face	2 Follow-up Attendance Face-to-face	3 First Telephone or Telemedicine Consultation	4 Follow-up Telephone or Telemedicine Consultation
OPCS-4 Code	None or X62.1 Assessment by uni-professional team NEC	WF01B	WF01A	WF01D	WF01C
	X62.2 Assessment by multi-professional team NEC or X62.3 Assessment by multi-disciplinary team NEC	WF02B	WF02A	WF02D	WF02C

*Attendance Type refers to the NHS Data Dictionary item FIRST ATTENDANCE.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter WH – Poisoning, Toxic Effects, Special Examinations, Screening and Other Healthcare Contacts

Subchapter **WH Poisoning, Toxic Effects, Special Examinations, Screening and Other Healthcare Contacts** is made up of a range of disparate healthcare activity including poisoning, toxic effects, special examinations and screening.

The subchapter includes a single procedure-driven HRG root, for lymphatic system procedures for patients of all ages.

The majority of diagnosis-driven HRG roots within this subchapter are for adult care activities only; however, the HRG roots for procedures not carried out, certain diagnoses related to organ donation and certain diagnoses related to procreative management are for patients of all ages.

Subchapter WH includes activity undertaken in inpatient, day case and non-admitted care settings.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	68	68
Total HRG Roots	28	29
Procedure-driven HRGs	2	2
Diagnosis-driven HRGs	66	66
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

There are specific HRG roots for acute disorders including transplant rejection, other post-procedure complications and follow-up care, as well as HRG roots specific to poisonings, allergies and effects of environment. The remaining HRG roots cover various signs and symptoms and healthcare contacts, e.g. abdominal pain, senility, abnormal findings and respite care.

There are two HRG roots specific to planned procedures not carried out – split by “patient reason” and “other / unspecified” reason. HRG root **WH50 Procedure Not Carried Out** employs global logic and is generated when no significant procedure is recorded with any primary diagnosis with a secondary diagnosis from ICD-10 rubric **Z53.- Persons encountering health services for specific procedures, not carried out**.

Interactive CC splits are employed within the majority of HRG roots within this subchapter – up to a maximum of four levels – to more appropriately differentiate expected resource usage between routine and complex patients.

In addition, intervention splits, including where the presence of multiple interventions affects grouping, are employed within the majority of HRG roots in this subchapter.

All diagnosis-driven activity (with the exception of some donation and procreative management diagnoses) relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

Five ICD-10 congenital diagnosis codes, ***Q86.0 Fetal alcohol syndrome (dysmorphic)***, ***Q86.1 Fetal hydantoin syndrome***, ***Q86.2 Dysmorphism due to warfarin***, ***Q86.8 Other congenital malformation syndromes due to known exogenous causes*** and ***Q89.4 Conjoined twins***, previously U grouped where the patient was 19 years or over. These codes have been remapped to base HRG **WH15 Special Screening, Examinations or Other Genetic Disorders**, to reflect that, although it would be 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 (unlike the ***P Perinatal*** ICD-10 codes that appropriately U group if recorded in adult patient record, in accordance with national coding rules).

Subchapter WJ – Infectious Diseases and Immune System Disorders

Subchapter **WJ Infectious Diseases and Immune System Disorders** covers multi-systemic infectious diseases and immune system disorders.

This subchapter is for adult activity only, with the exception of several genitourinary infection HRG roots that are intended to cover patients of all ages.

It includes activity undertaken in inpatient and day case settings.

There are disease-specific HRGs for infections such as sepsis, unknown fever, HIV and genitourinary medicine (GUM) disorders. There is one HRG root specific to all other immune system disorders.

The remainder of multi-systemic infectious diseases are split across three HRG roots based on the complexity of the disorder – standard, major and complex.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	38	40
Total HRG Roots	8	9
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	38	40
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	Yes	Yes
Multiple Procedures	No	No
Procedure Combination Codes	No	No
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	No	No

Interactive CC splits are employed within the majority of HRG roots within this subchapter – up to a maximum of four levels – to more appropriately differentiate expected resource usage between routine and complex patients.

In addition, intervention splits, including where the presence of multiple interventions affects grouping, are employed within the majority of the HRG roots in this subchapter.

All diagnosis-driven activity (with the exception of some genitourinary infections) relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

HRGs have been deleted

WJ05A Septic Shock with CC Score 5+ and **WJ05B Septic Shock with CC Score 0-4** have been deleted to reflect the fact that septic shock should not be recorded as a primary diagnosis, in accordance with national coding guidance effective 1 April 2017. Therefore the septic shock and severe sepsis diagnoses codes, when recorded as the primary diagnosis in a patient record, have been remapped to **UZ01Z Data Invalid for Grouping**. The remaining shock codes; ***A483 Toxic shock syndrome***, ***R571 Hypovolaemic shock***, ***R758 Other shock*** and ***R579 Shock, unspecified***, that mapped to base HRG of **WJ05 Septic Shock** have been remapped to **WJ06 Sepsis**.

Subchapter XA – Neonatal Critical Care

Subchapter **XA Neonatal Critical Care** includes unbundled HRGs and covers neonatal critical care, including transportation (retrieval).

Other critical care services are addressed in Subchapters **XC Adult Critical Care** and **XB Paediatric Critical Care**.

The HRGs within this Subchapter are split into five levels of complexity: there is one HRG specific to neonatal intensive care activity (NICU) – **XA01Z Neonatal Critical Care, Intensive Care** – and one HRG specific to neonatal high dependency care (NHDU) – **XA02Z Neonatal Critical Care, High Dependency**, with three HRGs specific to the neonatal special care baby unit (SCBU) or to transitional care activity – **XA03Z Neonatal Critical Care, Special Care, without External Carer**, **XA04Z Neonatal Critical Care, Special Care, with External Carer** and **XA05Z Neonatal Critical Care, Normal Care**.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	6	6
Total HRG Roots	6	6
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	0	0
Age Splits	N/A	N/A
Complications and Comorbidities Splits	N/A	N/A
Intervention Splits	N/A	N/A
Multiple Procedures	N/A	N/A
Procedure Combination Codes	N/A	N/A
Diagnosis-qualified	N/A	N/A
Subsidiary Procedure-qualified	N/A	N/A
Length of Stay-qualified	N/A	N/A

The HRGs are generated from information within the neonatal Critical Care Minimum Data Set (Version 2.0, 2016) on a per diem basis, based on the critical care unit function and critical care activity codes recorded.

For this subchapter, grouping is based on data items from the Neonatal Critical Care Minimum Data Set (Version 2.0, 2016), but additional data items are required from the Admitted Patient Care Data Set (Discharge Date and Discharge Method). The main driver for grouping is the Critical Care Activity Code (CCAC).

One neonatal critical care HRG is generated for each day the baby receives critical care. The HRGs are unbundled, being generated in addition to the HRGs for the associated admitted patient care episode or spell.

Please see the grouping algorithm flowchart below for further information.

There is also an HRG specific to neonatal transportation – **XA06Z Neonatal Critical Care, Transportation.**

XA06Z Neonatal Critical Care, Transportation is derived from the Admitted Patient Care data set as the Neonatal Critical Care Data Set does not incorporate data items that can be used to identify transportation. This represents the transfer from one provider trust to another, of a baby in neonatal critical care.

Grouping is driven by the following parameters:

- Admission method
- Source of admission
- Treatment function code
- Neonatal level of care

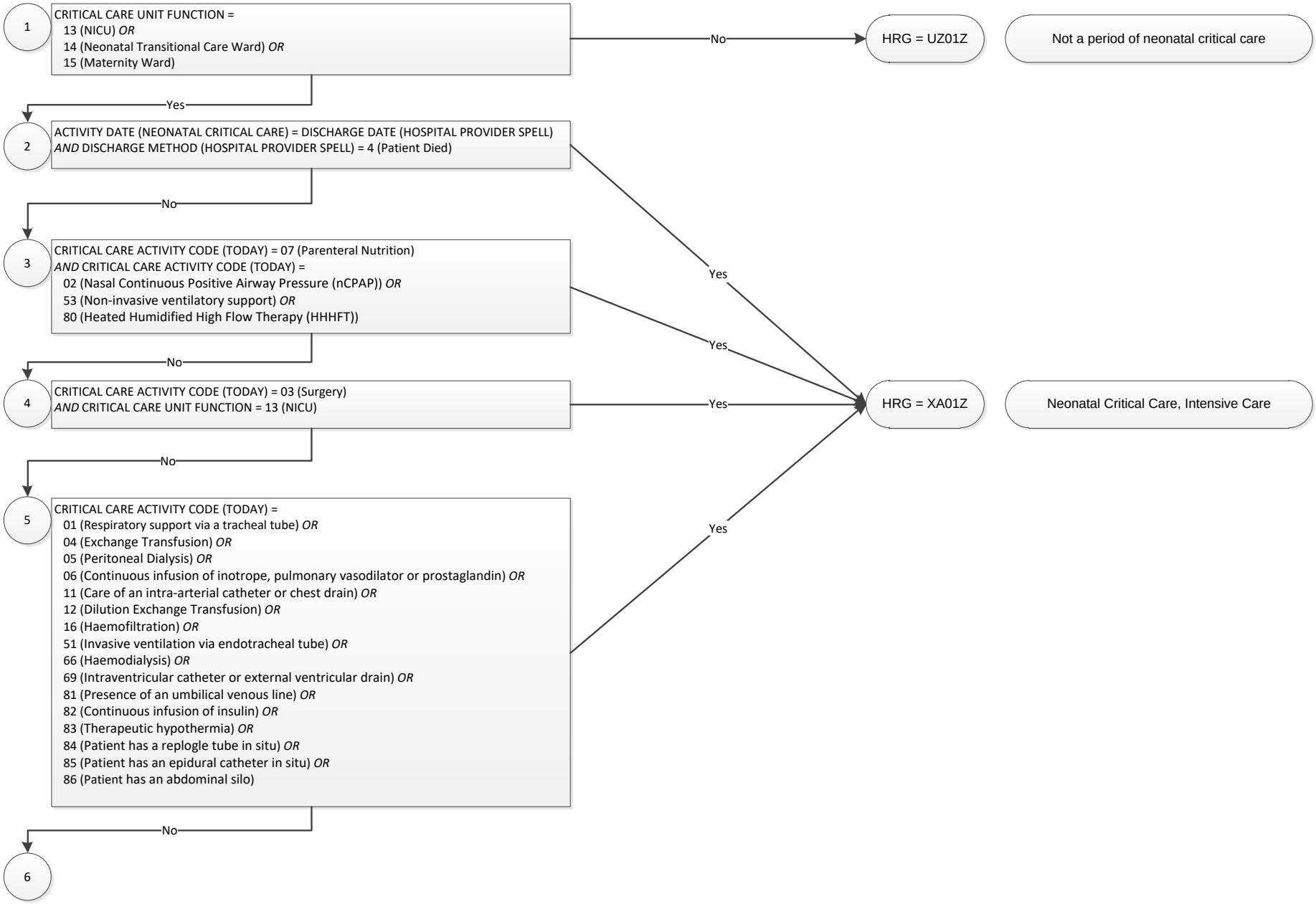
All of the following criteria must be met in order to derive the transportation HRG:

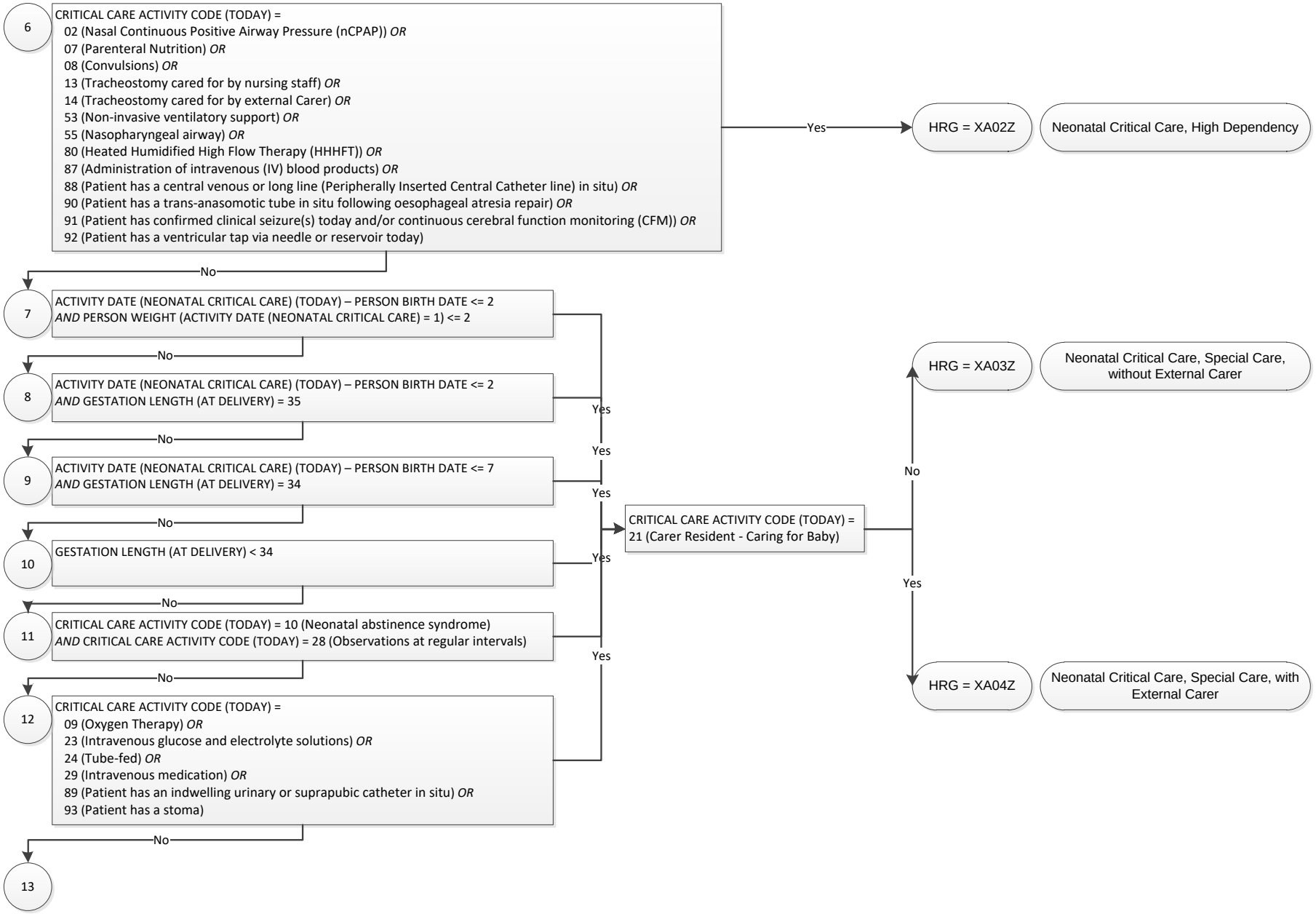
Data Item	Value	Notes
Admission Method	81: Transfer of any admitted patient from other hospital provider other than in an emergency (Data submitted using CDS 6.1 or 6.2) or 28: Other Means (includes transfer of an admitted patient from another hospital provider in an emergency) (Data submitted using CDS 6.1 only) or 2B: Transfer of an admitted PATIENT from another Hospital Provider in an emergency (Data submitted using CDS 6.2 only)	Hospital transfer
Source of Admission	52: NHS other hospital provider – ward for maternity patients or neonates or 87: Non NHS run hospital	Confirms the transfer is from another hospital (Admission Method 28 includes other locations)
Treatment Function Code	422: Neonatology – Special Care, High Dependency and Intensive Care	
Neonatal Level of Care	3: Level 1 Intensive Care (Maximal Intensive Care) or 2: Level 2 Intensive Care (High Dependency Intensive Care)	

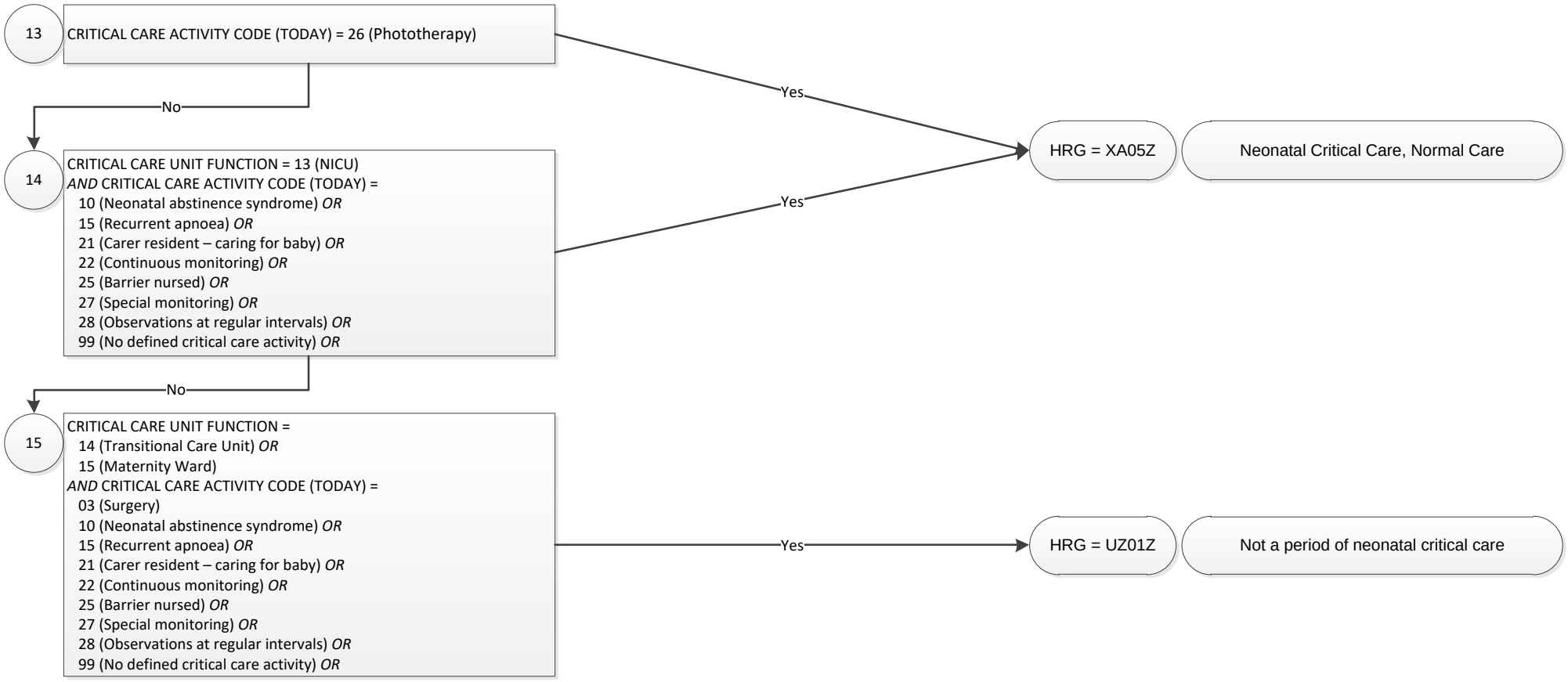
Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.







Subchapter XB – Paediatric Critical Care

Subchapter **XB Paediatric Critical Care** includes unbundled HRGs and covers paediatric critical care, including transportation (retrieval). Other critical care services are addressed in Subchapters **XC Adult Critical Care** and **XA Neonatal Critical Care**.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	9	9
Total HRG Roots	9	9
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	0	0
Age Splits	N/A	N/A
Complications and Comorbidities Splits	N/A	N/A
Intervention Splits	N/A	N/A
Multiple Procedures	N/A	N/A
Procedure Combination Codes	N/A	N/A
Diagnosis-qualified	N/A	N/A
Subsidiary Procedure-qualified	N/A	N/A
Length of Stay-qualified	N/A	N/A

The HRGs within this Subchapter are split into eight levels of complexity; there are five HRGs specific to paediatric intensive care activity, which would be undertaken in a paediatric intensive care unit (PICU) and three HRGs specific to paediatric high dependency care activity, which may take place in a PICU or on a paediatric high dependency ward.

The HRGs are generated from information within the Paediatric Critical Care Minimum Data Set (Version 2.0, 2016) on a per diem basis, based on the critical care unit function and critical care activity codes recorded.

Grouping is based primarily on data items from the Paediatric Critical Care Minimum Data Set (Version 2.0, 2016), but additional data items are required from the Admitted Patient Care Data Set (including Discharge Date, Discharge Method and Diagnosis).

One paediatric critical care HRG is generated for each day the child receives critical care. The HRGs are unbundled, being generated in addition to the HRGs for the associated admitted patient care episode and spell.

Please see the grouping algorithm flowchart below for further information.

There is also an HRG specific to paediatric transportation – **XB08Z Paediatric Critical Care, Transportation**. The paediatric critical care transportation HRG is derived from the Admitted Patient Care Data Set.

All of the following criteria must be met in order to derive the transportation HRG:

Data Item	Value	Notes
Admission Method	81: Transfer of any admitted patient from other hospital provider other than in an emergency (Data submitted using CDS 6.1 or 6.2) or 28: Other Means (includes transfer of an admitted patient from another hospital provider in an emergency) (Data submitted using CDS 6.1 only) or 2B: Transfer of an admitted PATIENT from another Hospital Provider in an emergency (Data submitted using CDS 6.2 only)	Hospital transfer
Source of Admission	51: NHS other hospital provider – ward for general patients or the younger physically disabled or A&E department or 87: Non NHS run hospital	Confirms the transfer is from another hospital (Admission Method 28 includes other locations)
Treatment Function Code of the first episode in the spell	242: Paediatric Intensive Care – Only to be used by designated Paediatric Intensive Care Units	

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter XB: Worked Examples

Case A: A patient is being treated in the paediatric critical care unit and has apnoea requiring intervention.

Case	Critical Care Unit Function Code	Patient Age (Days)	Discharge Method (Hospital Provider Spell)	Main Critical Care Activity Code	Other Critical Care Activity Codes	ICD-10 Diagnosis Code		HRG4+	
A	04 (Paediatric Intensive Care Unit)	10	1(Patient discharged on clinical advice or with clinical consent)	58 Apnoea requiring intervention				XB07Z	Paediatric Critical Care, Basic Critical Care

Case B: A patient is being treated on a ward for children and young people and has central venous pressure monitoring.

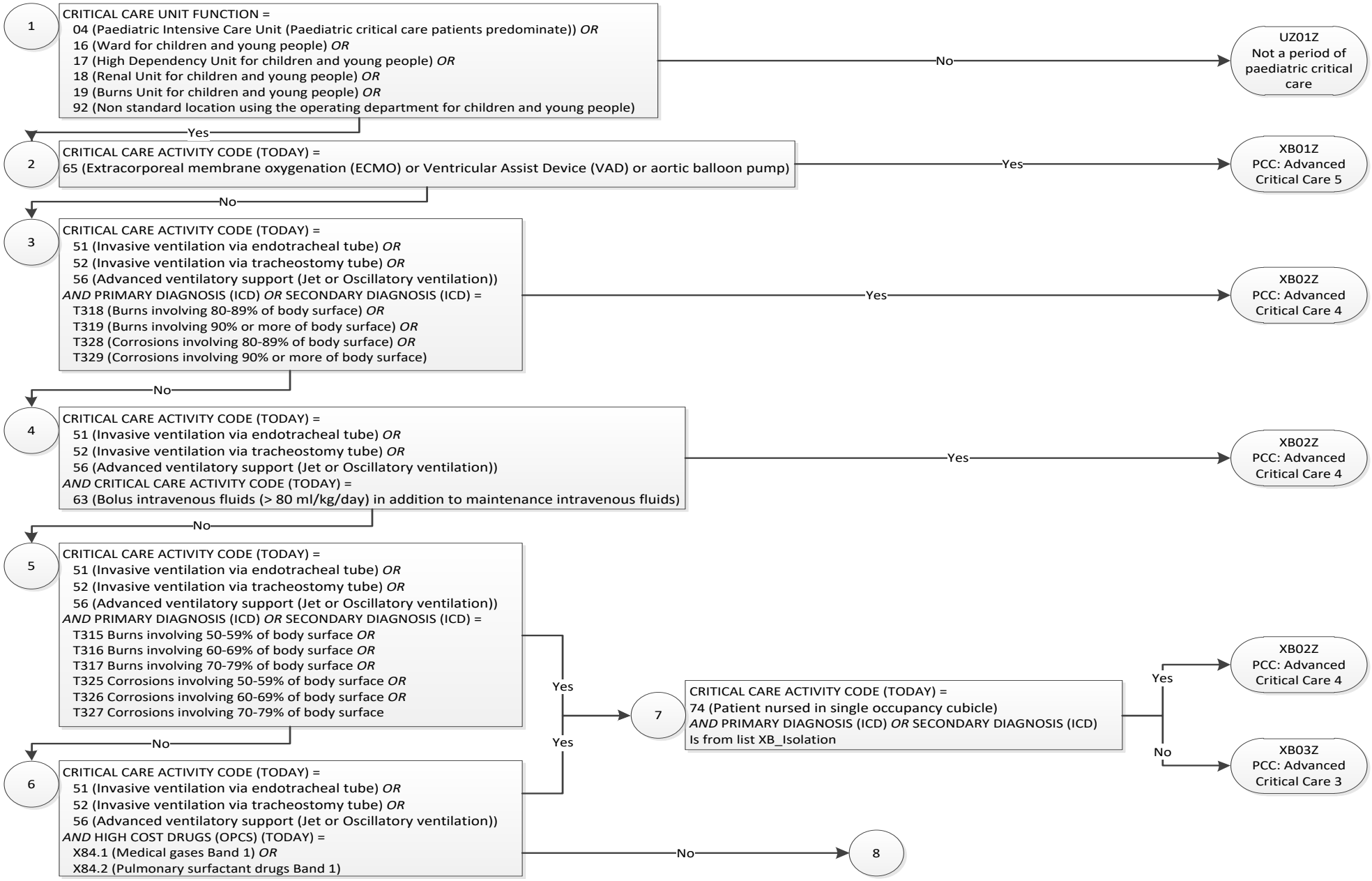
B	16 (Ward for children and young people)	10	1(Patient discharged on clinical advice or with clinical consent)	62 Central venous pressure monitoring				XB06Z	Paediatric Critical Care, Basic Critical Care

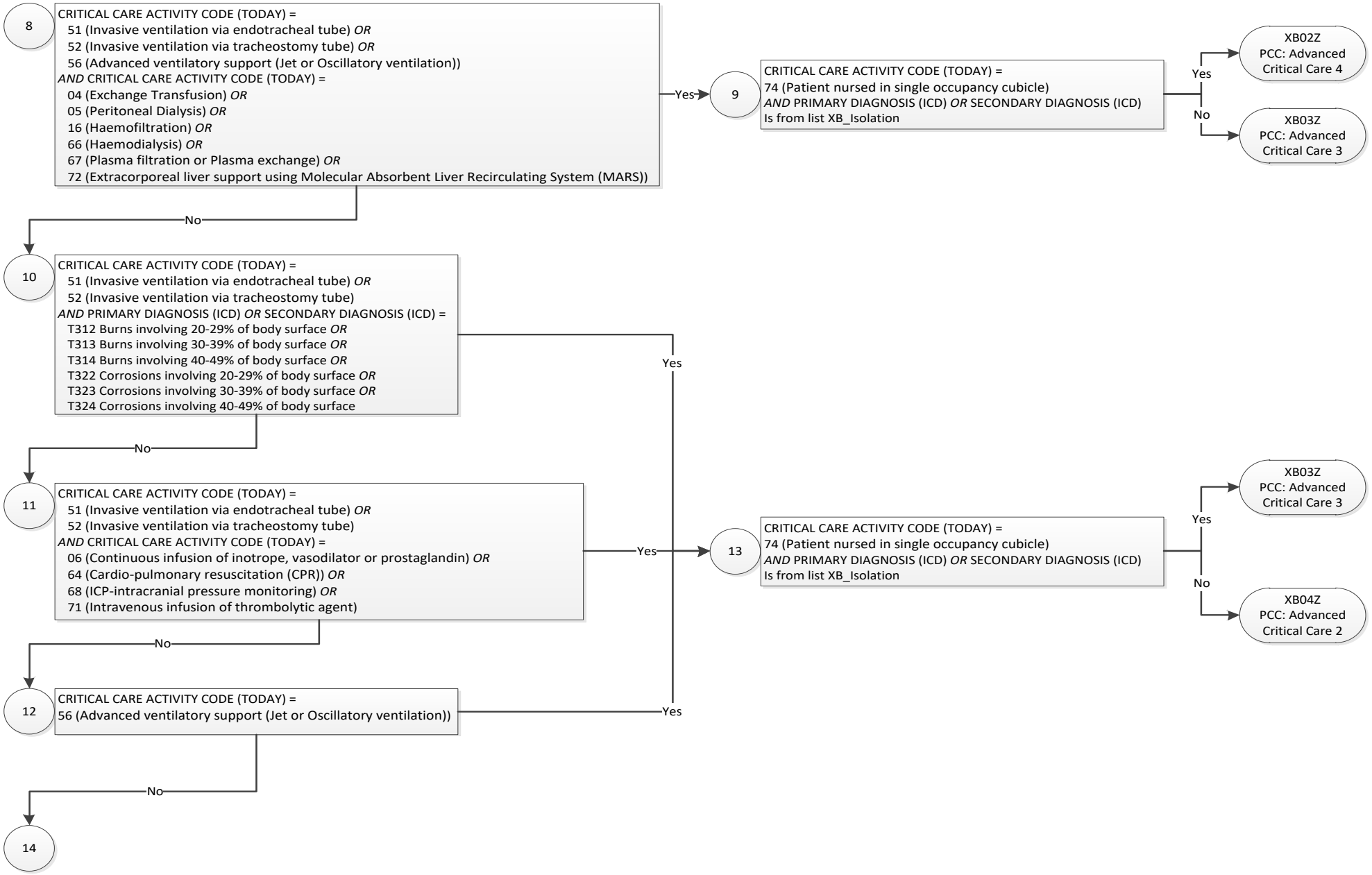
Case C: A patient is being treated in the paediatric critical care unit and has invasive ventilation after being severely burned. This illustrates how the diagnosis is used in deriving the HRG.

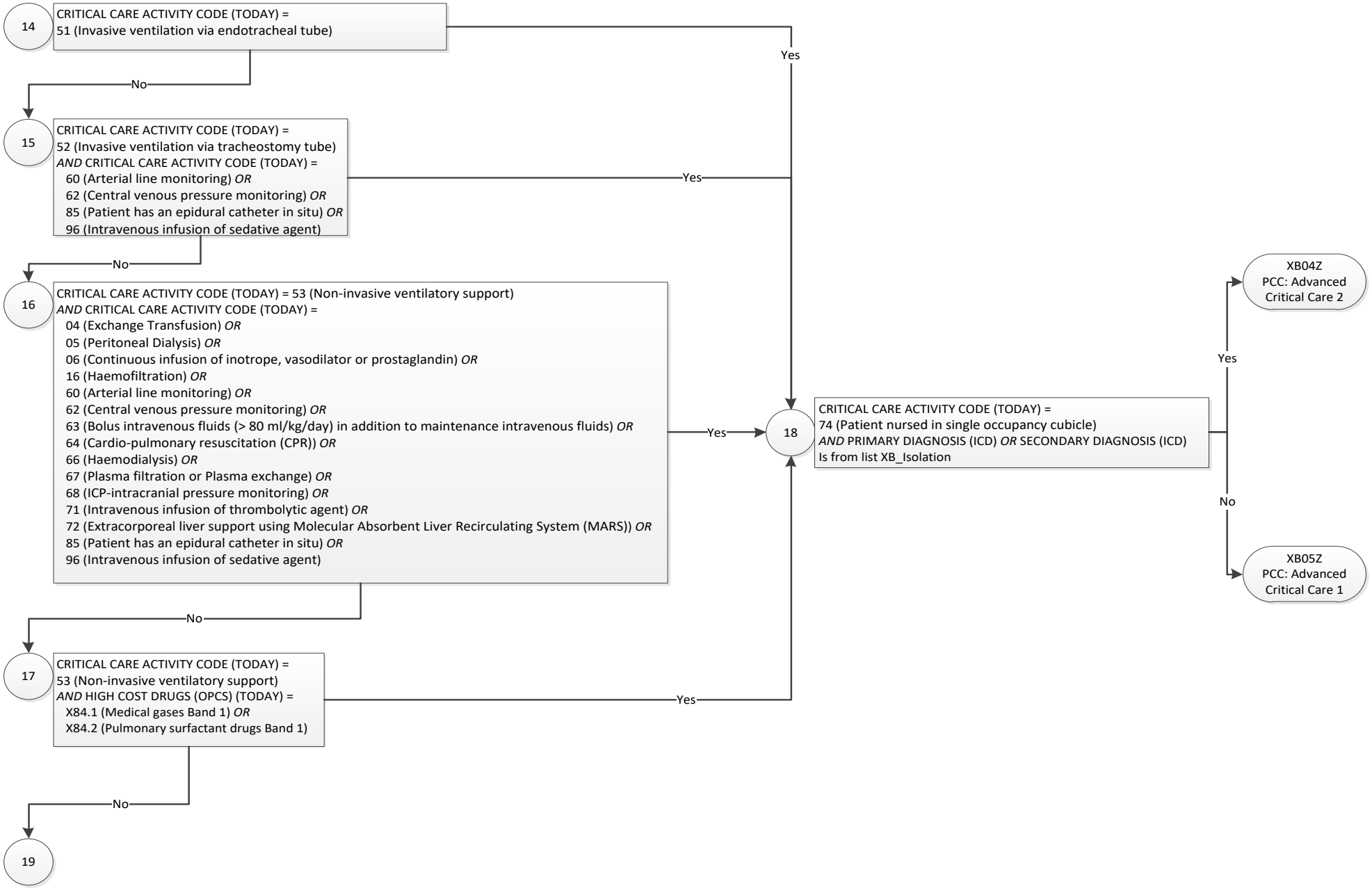
C	04 (Paediatric Intensive Care Unit)	10	1(Patient discharged on clinical advice or with clinical consent)	51 Invasive ventilation via endotrachial tube		T31.5	Burns involving 50-59% of body surface	XB03Z	Paediatric Critical Care, Advanced Critical Care 3

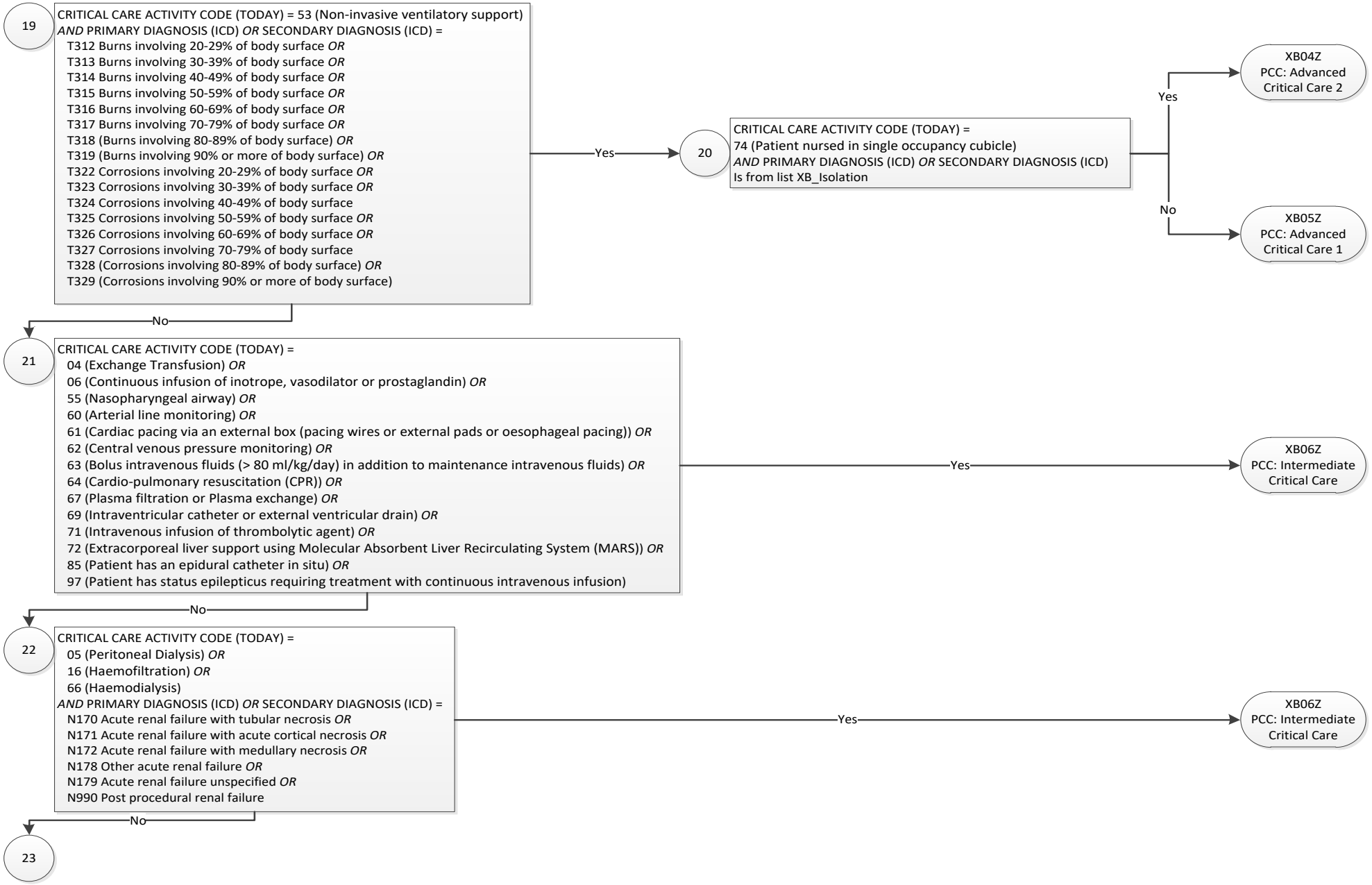
Case D: A patient with renal hypoplasia who develops adenoviral pneumonia is admitted to a single occupancy cubicle in the paediatric critical care unit. This illustrates how both the diagnosis and CCAC affect the HRG derived.

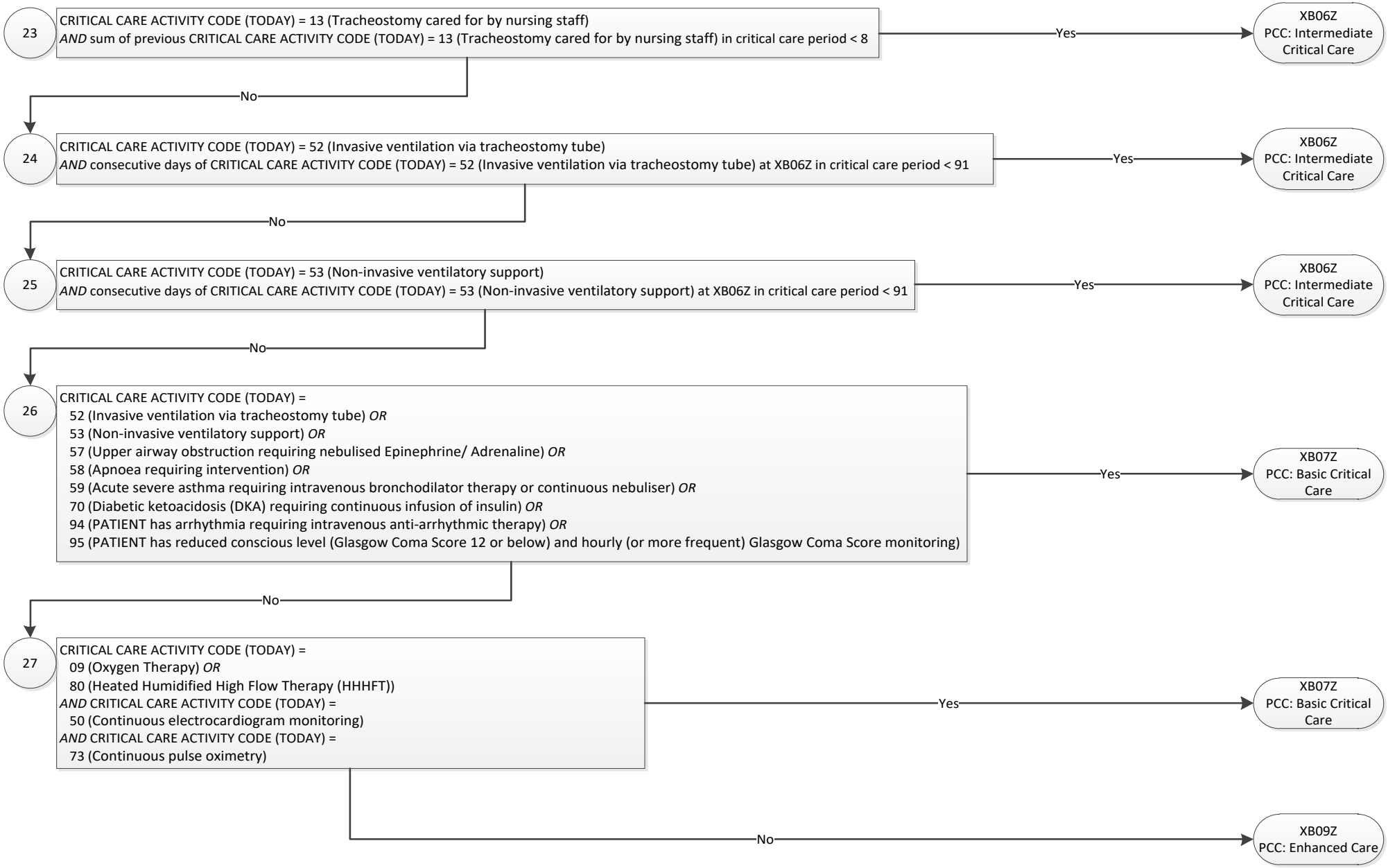
D	04 (Paediatric Intensive Care Unit)	10	1(Patient discharged on clinical advice or with clinical consent)	51 Invasive ventilation via endotrachial tube	05 Peritoneal dialysis + + 74 Patient nursed on single occupancy cubicle	Q60.5 +_ J12.0	Renal hypoplasia, unspecified + Adenovial pneumonia	XB02Z	Paediatric Critical Care, Advanced Critical Care 4











Subchapter XB: Appendix E: List XB_ISOLATION

ICD-10 code	Description
A000	Cholera due to Vibrio cholerae 01, biovar cholerae
A001	Cholera due to Vibrio cholerae 01, biovar eltor
A009	Cholera, unspecified
A010	Typhoid fever
A011	Paratyphoid fever A
A012	Paratyphoid fever B
A013	Paratyphoid fever C
A014	Paratyphoid fever, unspecified
A020	Salmonella enteritis
A021	Salmonella sepsis
A022	Localized salmonella infections
A030	Shigellosis due to Shigella dysenteriae
A031	Shigellosis due to Shigella flexneri
A032	Shigellosis due to Shigella boydii
A033	Shigellosis due to Shigella sonnei
A038	Other shigellosis
A039	Shigellosis, unspecified
A043	Enterohaemorrhagic Escherichia coli infection
A045	Campylobacter enteritis
A047	Enterocolitis due to Clostridium difficile
A072	Cryptosporidiosis
A080	Rotaviral enteritis
A081	Acute gastroenteropathy due to Norwalk agent
A082	Adenoviral enteritis
A083	Other viral enteritis
A084	Viral intestinal infection, unspecified
A090	Other and unspecified gastroenteritis and colitis of infectious origin
A099	Gastroenteritis and colitis of unspecified origin
A150	Tuberculosis of lung, confirmed by sputum microscopy with or without culture
A151	Tuberculosis of lung, confirmed by culture only
A152	Tuberculosis of lung, confirmed histologically
A153	Tuberculosis of lung, confirmed by unspecified means
A154	Tuberculosis of intrathoracic lymph nodes, confirmed bacteriologically and histologically
A155	Tuberculosis of larynx, trachea and bronchus, confirmed bacteriologically and histologically
A156	Tuberculous pleurisy, confirmed bacteriologically and histologically
A157	Primary respiratory tuberculosis, confirmed bacteriologically and histologically
A158	Other respiratory tuberculosis, confirmed bacteriologically and histologically
A159	Respiratory tuberculosis unspecified, confirmed bacteriologically and histologically
A170	Tuberculous meningitis
A192	Acute miliary tuberculosis, unspecified
A360	Pharyngeal diphtheria
A361	Nasopharyngeal diphtheria
A362	Laryngeal diphtheria
A363	Cutaneous diphtheria
A368	Other diphtheria

ICD-10 code	Description
A369	Diphtheria, unspecified
A370	Whooping cough due to Bordetella pertussis
A371	Whooping cough due to Bordetella parapertussis
A378	Whooping cough due to other Bordetella species
A379	Whooping cough, unspecified
A38X	Scarlet fever
A390	Meningococcal meningitis
A392	Acute meningococcaemia
A394	Meningococcaemia, unspecified
A399	Meningococcal infection, unspecified
A871	Adenoviral meningitis
A984	Ebola virus disease
B000	Eczema herpeticum
B001	Herpesviral vesicular dermatitis
B002	Herpesviral gingivostomatitis and pharyngotonsillitis
B003	Herpesviral meningitis
B004	Herpesviral encephalitis
B005	Herpesviral ocular disease
B007	Disseminated herpesviral disease
B008	Other forms of herpesviral infection
B009	Herpesviral infection, unspecified
B010	Varicella meningitis
B011	Varicella encephalitis
B012	Varicella pneumonia
B018	Varicella with other complications
B019	Varicella without complication
B020	Zoster encephalitis
B021	Zoster meningitis
B022	Zoster with other nervous system involvement
B023	Zoster ocular disease
B027	Disseminated zoster
B028	Zoster with other complications
B029	Zoster without complication
B050	Measles complicated by encephalitis
B051	Measles complicated by meningitis
B052	Measles complicated by pneumonia
B053	Measles complicated by otitis media
B054	Measles with intestinal complications
B058	Measles with other complications
B059	Measles without complication
B150	Hepatitis A with hepatic coma
B159	Hepatitis A without hepatic coma
B172	Acute hepatitis E
B200	HIV disease resulting in mycobacterial infection
B201	HIV disease resulting in other bacterial infections
B202	HIV disease resulting in cytomegaloviral disease
B203	HIV disease resulting in other viral infections

ICD-10 code	Description
B204	HIV disease resulting in candidiasis
B205	HIV disease resulting in other mycoses
B206	HIV disease resulting in Pneumocystis jirovecii pneumonia
B207	HIV disease resulting in multiple infections
B208	HIV disease resulting in other infectious and parasitic diseases
B209	HIV disease resulting in unspecified infectious or parasitic disease
B230	Acute HIV infection syndrome
B24X	Unspecified human immunodeficiency virus [HIV] disease
B260	Mumps orchitis
B261	Mumps meningitis
B262	Mumps encephalitis
B263	Mumps pancreatitis
B268	Mumps with other complications
B269	Mumps without complication
B300	Keratoconjunctivitis due to adenovirus
B301	Conjunctivitis due to adenovirus
B440	Invasive pulmonary aspergillosis
B441	Other pulmonary aspergillosis
B442	Tonsillar aspergillosis
B447	Disseminated aspergillosis
B448	Other forms of aspergillosis
B449	Aspergillosis, unspecified
B970	Adenovirus as the cause of diseases classified to other chapters
B974	Respiratory syncytial virus as the cause of diseases classified to other chapters
D70X	Agranulocytosis
D810	Severe combined immunodeficiency [SCID] with reticular dysgenesis
D811	Severe combined immunodeficiency [SCID] with low T- and B-cell numbers
D812	Severe combined immunodeficiency [SCID] with low or normal B-cell numbers
D848	Other specified immunodeficiencies
J100	Influenza with pneumonia, seasonal influenza virus identified
J101	Influenza with other respiratory manifestations, seasonal influenza virus identified
J120	Adenoviral pneumonia
J121	Respiratory syncytial virus pneumonia
J122	Parainfluenza virus pneumonia
J152	Pneumonia due to staphylococcus
J158	Other bacterial pneumonia
J204	Acute bronchitis due to parainfluenza virus
J205	Acute bronchitis due to respiratory syncytial virus
J210	Acute bronchiolitis due to respiratory syncytial virus
J218	Acute bronchiolitis due to other specified organisms
J219	Acute bronchiolitis, unspecified
L123	Acquired epidermolysis bullosa
L511	Bullous erythema multiforme
L512	Toxic epidermal necrolysis [Lyell]
T312	Burns involving 20-29% of body surface
T313	Burns involving 30-39% of body surface
T314	Burns involving 40-49% of body surface

ICD-10 code	Description
T315	Burns involving 50-59% of body surface
T316	Burns involving 60-69% of body surface
T317	Burns involving 70-79% of body surface
T318	Burns involving 80-89% of body surface
T319	Burns involving 90% or more of body surface
T322	Corrosions involving 20-29% of body surface
T323	Corrosions involving 30-39% of body surface
T324	Corrosions involving 40-49% of body surface
T325	Corrosions involving 50-59% of body surface
T326	Corrosions involving 60-69% of body surface
T327	Corrosions involving 70-79% of body surface
T328	Corrosions involving 80-89% of body surface
T329	Corrosions involving 90% or more of body surface
T860	Bone-marrow transplant rejection
U049	Severe acute respiratory syndrome [SARS], unspecified
U821	Resistance to methicillin
U822	Extended spectrum betalactamase (ESBL) resistance
U828	Resistance to other betalactam antibiotics
U829	Resistance to betalactam antibiotics, unspecified
U830	Resistance to vancomycin
U837	Resistance to multiple antibiotics
U838	Resistance to other single specified antibiotic
U841	Resistance to antifungal drug(s)
U842	Resistance to antiviral drug(s)
U843	Resistance to tuberculostatic drug(s)
U847	Resistance to multiple antimicrobial drugs
Z943	Heart and lungs transplant status
Z944 with Z940	Liver transplant status with Kidney transplant status
Z944 with Z948	Liver transplant status with Other transplanted organ and tissue status
A400 with M726*	Sepsis due to streptococcus, group A with Necrotizing fasciitis

“*”Fifth character code

Subchapter XC – Adult Critical Care

Subchapter XC includes unbundled HRGs and covers adult critical care services. Other critical care services are addressed in Subchapters **XA Neonatal Critical Care** and **XB Paediatric Critical Care**.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	7	7
Total HRG Roots	7	7
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	0	0
Age Splits	N/A	N/A
Complications and Comorbidities Splits	N/A	N/A
Intervention Splits	N/A	N/A
Multiple Procedures	N/A	N/A
Procedure Combination Codes	N/A	N/A
Diagnosis-qualified	N/A	N/A
Subsidiary Procedure-qualified	N/A	N/A
Length of Stay-qualified	N/A	N/A

Subchapter XC comprises HRGs specific to the number of organs the patient needs supported – from 0 to 6+ and the HRGs are generated from information within the Critical Care Minimum Data Set.

The adult critical care HRGs are unbundled from the rest of the patient episode. The HRGs are based on the data in the Critical Care Minimum Data Set and differentiate on the level of support required by the patient, which is determined by the number of organ systems supported.

Adult critical care HRGs are generated per Critical Care Period, i.e., one (maximum) HRG is generated for each Critical Care Period and not on a per-diem basis, although Grouper output will also identify the number of days for each critical care period.

In addition to the Critical Care Unit Function Field, the following additional fields from the Critical Care MDS are used in the derivation of these HRGs. These fields are related to the organ support groups.

- Advanced Respiratory Support Days
- Basic Respiratory Support Days
- Advanced Cardiovascular Support Days
- Basic Cardiovascular Support Days
- Renal Support Days
- Neurological Support Days
- Dermatological Support Days
- Liver Support Days

Gastrointestinal support days do not contribute to the derivation of critical care HRGs, on clinical advice. The expected cost of providing this support is subsumed within other organ support groups.

Note that the field “Organ Support Maximum” is not used in grouping; the number of organ systems supported is calculated based on the existence of support days for each of the organ systems.

In addition to the fields listed above, the grouper requires Critical Care Start Date and Critical Care Discharge Date in the input data. These are used to calculate critical care days in the grouper output file. They are not used in HRG derivation.

Please see the grouping algorithm flowchart below for further information.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

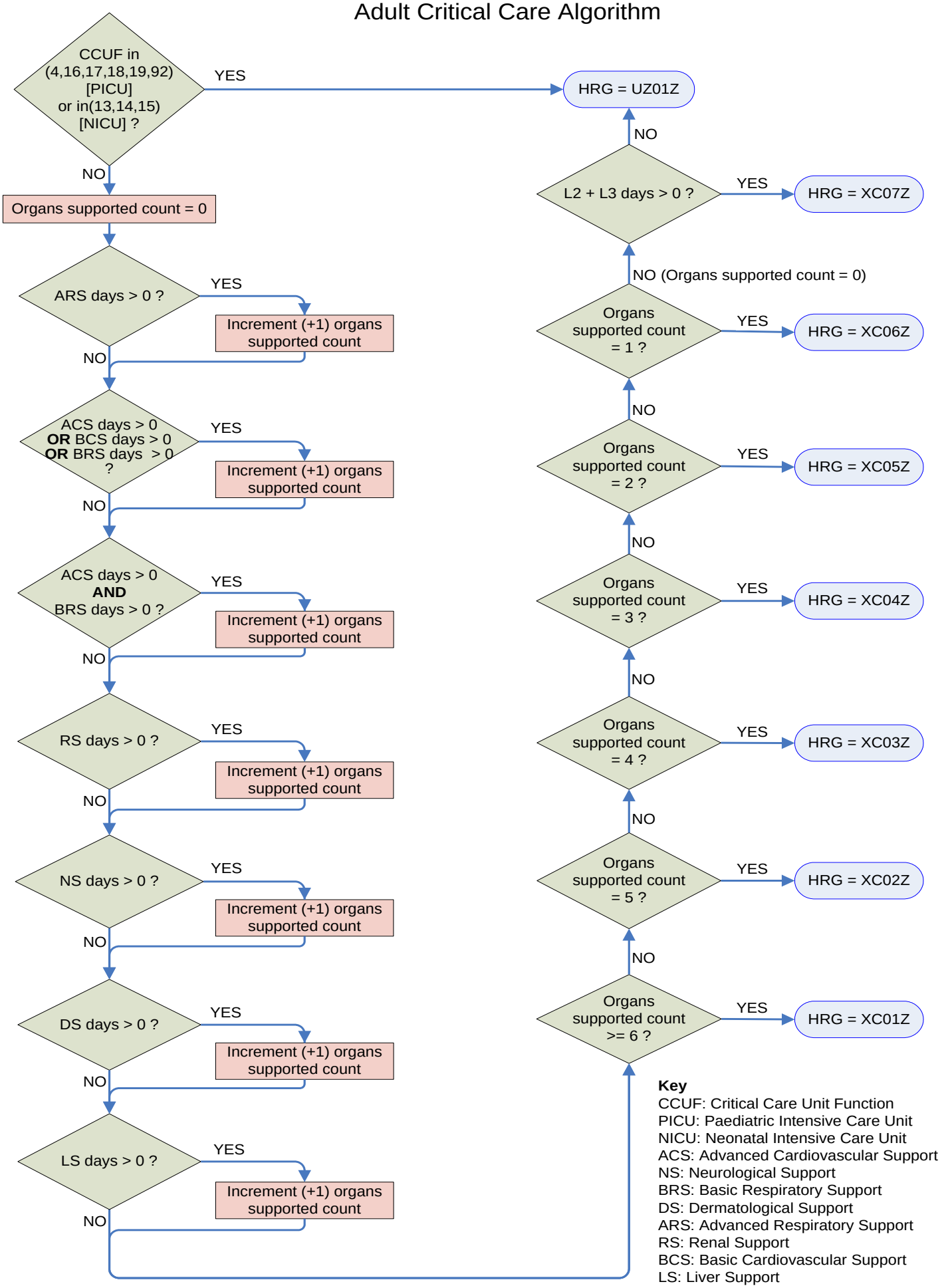
No changes directly impacting this subchapter have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter XC: Worked Examples

Advanced Respiratory Support days	Basic Respiratory Support days	Advanced Cardiovascular support days	Basic Cardiovascular support days	Renal Support days	Neurological Support days	Dermatological Support days	Liver Support days	L2 Days	L3 Days	CC Start date	CC Discharge Date	Unit Function	Length of Stay	HRG4+	Comment
Case A illustrates a patient having basic and advanced respiratory support.															
1	1	0	0	0	0	0	0	1	1	01 Jan 16	02 Jan 16	1	2	XC05Z	Two organ systems supported
Case B illustrates a patient having basic and advanced respiratory support plus basic and advanced cardiovascular support.															
5	10	4	4	0	0	0	0	10	5	01 Jan 16	15 Jan 16	2	15	XC04Z	Three organ systems supported
Case C illustrates a patient having basic and advanced respiratory support plus liver support.															
2	1	0	0	0	0	0	1	0	3	01 Jan 16	03 Jan 16	2	3	XC04Z	Three organ systems supported

Advanced Respiratory Support days	Basic Respiratory Support days	Advanced Cardiovascular support days	Basic Cardiovascular support days	Renal Support days	Neurological Support days	Dermatological Support days	Liver Support days	L2 Days	L3 Days	CC Start date	CC Discharge Date	Unit Function	Length of Stay	HRG4+	Comment
Case D illustrates a patient having basic and advanced cardiovascular support.															
0	0	5	5	0	0	0	0	10	0	01 Jan 16	10 Jan 16	1	10	XC06Z	One organ system supported
Case E illustrates a patient with no organ systems supported and neither Level 2 nor Level 3 care.															
0	0	0	0	0	0	0	0	0	0	01 Jan 16	05 Jan 16	1	5	UZ01Z	Data Invalid for Grouping
Case F illustrates a patient with no organ systems support days and Level 2 care.															
0	0	0	0	0	0	0	0	1	0	01 Jan 16	05 Jan 16	5	5	XC07Z	No organ systems supported

Adult Critical Care Algorithm



Key
CCUF: Critical Care Unit Function
PICU: Paediatric Intensive Care Unit
NICU: Neonatal Intensive Care Unit
ACS: Advanced Cardiovascular Support
NS: Neurological Support
BRS: Basic Respiratory Support
DS: Dermatological Support
ARS: Advanced Respiratory Support
RS: Renal Support
BCS: Basic Cardiovascular Support
LS: Liver Support

Subchapter XD – High Cost Drugs

Subchapter **XD High Cost Drugs** includes unbundled HRGs and covers a selected number of high cost drugs across all body systems, for patients of all ages.

The list of named high cost drugs was created by the then Payment by Results team within the Department of Health (now NHS England and NHS Improvement pricing teams) in conjunction with advice from the High Cost Drugs Steering Group.

In Subchapter XD, there is a one-to-one mapping of high cost drug OPCS-4 codes to a high cost drug HRG.

Where multiple high cost drugs are recorded, multiple high cost drug HRGs will be generated, as one unbundled HRG is generated for each high cost drug code recorded in the patient record.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**58**	**58**
Total HRG Roots	**58**	**58**
Procedure-driven HRGs	58	58
Diagnosis-driven HRGs	0	0
Age Splits	N/A	N/A
Complications and Comorbidities Splits	N/A	N/A
Intervention Splits	N/A	N/A
Multiple Procedures	N/A	N/A
Procedure Combination Codes	N/A	N/A
Diagnosis-qualified	N/A	N/A
Subsidiary Procedure-qualified	N/A	N/A
Length of Stay-qualified	N/A	N/A

Multiple doses of the same drug will only generate one unbundled high cost drug HRG because the current HRG4+ design cannot consider dosage, due to a lack of such information in the underlying OPCS-4 codes or other data fields within the Commissioning Data Sets.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2017/18 Reference Costs Grouper when compared to the HRG4+ 2016/17 Reference Costs Grouper.

Subchapter YA – Neurological Imaging Interventions

Subchapter **YA Neurological Imaging Interventions** covers neurological imaging interventions for patients of all ages. It includes activity undertaken in inpatient, day case and non-admitted care settings.

This activity is separate from the neurosurgery procedures mapped to Subchapter **AA Nervous System Procedures and Disorders** and the other non-vascular imaging interventions found in the other subchapters within Chapter **Y Vascular Procedures and Disorders and Imaging Interventions**.

The HRGs are specific to the type of intracranial and extracranial imaging intervention performed.

They also differentiate between categories of embolisation based on size and complexity, and take into account where multiple procedures have been performed.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**11**	**11**
Total HRG Roots	**8**	**8**
Procedure-driven HRGs	11	11
Diagnosis-driven HRGs	0	0
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	Yes	Yes

YA11Z Percutaneous Transluminal Arteriography, of Intracranial or Extracranial Blood Vessel employs maximum length of stay logic to ensure that relatively minor procedures such as cerebral angiography are not used to determine the HRG for a long stay medical patient, e.g. a person who has suffered a stroke.

Interactive CC splits are employed within many of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Changes made to logic

The complications and comorbidities (CC) lists relating to imaging intervention subchapters, FDFEFFYF_CC, GAGBGCYG_CC and YAYQYR_CC, have been updated to include paediatric-specific CCs such as disorders of prematurity and autistic spectrum disorders to reflect the additional resource usage associated with treating patients with these underlying conditions.

Remapping of codes to more appropriately reflect resource usage

Two new combination codes have been created as part of the redesign of aortic aneurysm surgery, to support the identification of procedures undertaken alongside repair of aortic aneurysms, as part of the redesign of aortic aneurysm surgery. These combination codes; ***L713+Z361 Percutaneous transluminal embolisation of carotid artery*** and ***L713+Z367 Percutaneous transluminal embolisation of brachiocephalic artery*** have been mapped

to base HRG root **YA03 Percutaneous Transluminal Embolisation of, Single Small or Medium, Intracranial or Extracranial Aneurysm**, as per ***L713+NEURO Percutaneous transluminal embolisation of intracranial or extracranial artery.***

Subchapter YC – Neck Imaging Interventions

Subchapter **YC Neck Imaging Interventions** covers neck imaging interventions for patients of all ages. It includes activity undertaken in inpatient, day case and non-admitted care settings.

This activity is separate from the open and endoscopic neck procedures mapped to Subchapters **CA Ear, Nose, Mouth, Throat and Neck Procedures** and **KA Endocrine System Disorders** and the other non-vascular imaging interventions found in other subchapters within Chapter **Y Vascular Procedures and Disorders and Imaging Interventions**.

The HRGs are specific to the type of neck imaging intervention performed and consist of HRGs specific to image guided biopsies and aspirations and therapeutic procedures.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	3	0
Total HRG Roots	3	0
Procedure-driven HRGs	3	0
Diagnosis-driven HRGs	0	0
Age Splits	No	N/A
Complications and Comorbidities Splits	No	N/A
Intervention Splits	No	N/A
Multiple Procedures	No	N/A
Procedure Combination Codes	Yes	N/A
Diagnosis-qualified	No	N/A
Subsidiary Procedure-qualified	Yes	N/A
Length of Stay-qualified	Yes	N/A

With the exception of **YC10Z Percutaneous Therapeutic Neck Procedures**, all of the HRGs within this subchapter employ maximum length of stay logic to ensure that relatively minor procedures such as thoracentesis are not used to determine the HRG for a long stay medical patient, e.g. a person who has tuberculosis.

The majority of procedures that map to this subchapter are either combination codes which include an under image control OPCS-4 subsidiary code, or have logic applied to check for an under image control OPCS-4 subsidiary code.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

A new Subchapter has been created

A new subchapter, **YC Neck Imaging Interventions**, specific to neck imaging interventions has been created by creating new combination codes and remapping OPCS-4 codes from Subchapters **CA Ear, Nose, Mouth, Throat and Neck Procedures** and **KA Endocrine System Disorders.**
This subchapter consists of three new HRGs:

- **YC01Z Image Guided Core Needle Biopsy of Lesion of Neck**; specific to needle biopsy of glands, lymph nodes, muscle and soft tissue of the neck performed under image control
- **YC02Z Image Guided Fine Needle Aspiration of Lesion of Neck**; specific to fine needle aspiration of glands, lymph nodes, muscle and soft tissue of the neck performed under image control. This HRG can be reached via logic on the procedure codes that map to base HRG **YC01 Image Guided Core Needle Biopsy of Lesion of Neck**, but where a subsidiary code indicating aspiration is used to distinguish between the two procedures.

- **YC10Z Percutaneous Therapeutic Neck Procedures**; specific to sialoplasty, dilation and removal of calculus from salivary glands. This HRG can only be reached via logic that checks for a subsidiary image control procedure code, else an HRG within Subchapter **CA Ear, Nose, Mouth, Throat and Neck Procedures** will be generated.

Subchapter YD – Thoracic Imaging Interventions

Subchapter **YD Thoracic Imaging Interventions** covers thoracic imaging interventions for patients of all ages. It includes activity undertaken in inpatient, day case and non-admitted care settings.

This activity is separate from the open and endoscopic thoracic procedures mapped to Subchapter **DZ Respiratory System Procedures and Disorders**, and the other non-vascular imaging interventions found in other subchapters within Chapter **Y Vascular Procedures and Disorders and Imaging Interventions**.

The HRGs are specific to the type of thoracic imaging intervention performed, and consist of HRGs specific to thoracic ablative procedures, biopsy, drainage and aspiration interventions.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	5	5
Total HRG Roots	5	5
Procedure-driven HRGs	5	5
Diagnosis-driven HRGs	0	0
Age Splits	No	No
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	Yes	Yes

With the exception of **YD01Z Percutaneous Ablation of Lesion of Respiratory Tract**, all of the HRGs within this subchapter employ maximum length of stay logic to ensure that relatively minor procedures such as thoracentesis are not used to determine the HRG for a long stay medical patient, e.g. a person who has tuberculosis.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

A new combination code, ***E598+Y123 Percutaneous irreversible electroporation of lesion of lung***, has been 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**.

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

Within this subchapter OPCS-4 code ***T12.8 Other specified puncture of pleura*** has been remapped from **YD04Z Percutaneous Drainage of Pleural Cavity** to **YD05Z Percutaneous Aspiration of Pleural Cavity**, and a new combination code ***T128+Y032 Renewal of tube drain into pleural cavity*** has been created and mapped to **YD04Z Percutaneous Drainage of Pleural Cavity**.

OPCS- 4 Unspecified (-.9) global review

Within this subchapter, ***T12.9 specified puncture of pleura*** has been remapped from **YD04Z Percutaneous Drainage of Pleural Cavity** to **YD05Z Percutaneous Aspiration of Pleural Cavity** to match the mapping of the equivalent .8 code within the OPCS-4 rubric.

Subchapter YF – Gastrointestinal Imaging Interventions

Subchapter **YF Gastrointestinal Imaging Interventions** covers gastrointestinal imaging interventions for patients of all ages. It includes activity undertaken in inpatient, day case and non-admitted care settings.

This activity is separate from the open and endoscopic digestive system procedures mapped to Subchapter **FZ Digestive System Procedures and Disorders**, and the other non-vascular imaging interventions found in the other subchapters within Chapter **Y Vascular Procedures and Disorders and Imaging Interventions**.

The HRGs are specific to the type of gastrointestinal imaging intervention performed, and consist of HRGs specific to the insertion of gastrostomy and jejunostomy tubes and the drainage of abdominal abscesses.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**9**	**8**
Total HRG Roots	**5**	**4**
Procedure-driven HRGs	9	8
Diagnosis-driven HRGs	0	0
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

The drainage of abdominal abscess HRGs employ multiple procedure logic to take account of the additional expected resource usage of patients that undergo multiple drainage interventions.

The insertion of gastrostomy and jejunostomy HRGs within this subchapter employ maximum length of stay logic to ensure that relatively minor procedures such as these are not used to determine the HRG for a long stay medical patient, e.g. a person who has Crohn's disease.

Interactive CC splits are employed within the majority of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

New HRGs have been created

Several new combination codes have been created specific to image guided biopsy of abdominal organs e.g. omentum, peritoneum. These new combination codes have been mapped to a new procedure-specific HRG, **YF05Z Percutaneous Biopsy of Abdominal Cavity**, to appropriately reflect that these are percutaneous procedures. This activity would have previously mapped to HRGs within Subchapter **FF Digestive System Open and Laparoscopic Procedures**.

Changes made to logic

The complications and comorbidities (CC) lists relating to imaging intervention subchapters, FDFEFFYF_CC, GAGBGCYG_CC and YAYQYR_CC, have been updated to include paediatric-specific CCs such as disorders of prematurity and autistic spectrum disorders to reflect the additional resource usage associated with treating patients with these underlying conditions.

Remapping of codes to more appropriately reflect resource usage

Combination code ***G345+Y032 Renewal of gastrostomy tube*** has been deleted. This combination code can be used for both full renewals and renewal of part of the device i.e. the button. As it is more frequently used for the latter, which is more akin in resource terms to ‘attention to’ the device, the combination code is no longer required and this activity will appropriately default to the same HRGs as the ‘attention to’ code alone.

Combination code ***T315+Y53 Image controlled drainage of abdominal wall*** has been created and mapped to base HRG root **YF04 Percutaneous Single Drainage of Abdominal Abscess**. This activity would have previously mapped to base HRG root **FF51 Major General Abdominal Procedures**.

Subchapter YG – Hepatobiliary and Pancreatic Imaging Interventions

Subchapter **YG Hepatobiliary and Pancreatic Imaging Interventions** covers hepatobiliary and pancreatic imaging interventions for patients of all ages. It includes activity undertaken in inpatient, day case and non-admitted care settings.

This activity is separate from the open and endoscopic hepatobiliary and pancreatic procedures mapped to Subchapters **GA Hepatobiliary and Pancreatic System Open Procedures** and **GB Hepatobiliary and Pancreatic System Endoscopic Procedures**, respectively, and the other non-vascular imaging interventions found in the other subchapters within Chapter **Y Vascular Procedures and Disorders and Imaging Interventions**.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**16**	**16**
Total HRG Roots	**10**	**10**
Procedure-driven HRGs	16	16
Diagnosis-driven HRGs	0	0
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

The HRGs are specific to the type of hepatobiliary and pancreatic imaging interventions performed, and include HRGs specific to ablative procedures, the insertion of stents, drainage and biopsies.

The insertion of stents and drainage HRGs employ multiple procedure logic to take account of the additional resource usage of patients that have multiple stents inserted or undergo stent insertion with drainage. The stent HRGs also differentiate on type of stent i.e. standard or metal

Several HRGs within this subchapter employ maximum length of stay logic to ensure that relatively minor procedures such as biopsies are not used to determine the HRG for a long stay medical patient, e.g. a person with liver failure.

Interactive CC splits are employed within many of the HRGs to more appropriately differentiate expected resource usage between routine and complex patients.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

Changes made to logic

The complications and comorbidities (CC) lists relating to imaging intervention subchapters, FDFEFFYF_CC, GAGBGCYG_CC and YAYQYR_CC, have been updated to include paediatric-specific CCs such as disorders of prematurity and autistic spectrum disorders to reflect the additional resource usage associated with treating patients with these underlying conditions.

Remapping of codes to more appropriately reflect resource usage

OPCS-4 procedure code ***J50.1 T tube cholangiography*** has been remapped from HRG root **YG12 Other Percutaneous Diagnostic, Hepatobiliary or Pancreatic Procedures** to unbundled base HRG root **RD30 Contrast Fluoroscopy Procedures with duration of less than 20 minutes**, to reflect that this is a diagnostic imaging, rather than an imaging intervention, procedure.

New combination codes have been created specific to cryoablation and irreversible electroporation of lesion of the liver and pancreas, to ensure all types of percutaneous ablation procedures on the hepatobiliary system map to HRG root **YG01 Percutaneous Ablation of Lesion of, Liver or Pancreas**.

Subchapter YH – Musculoskeletal Imaging Interventions

Subchapter **YH Musculoskeletal Imaging Interventions** covers musculoskeletal imaging interventions for patients of all ages. It includes activity undertaken in inpatient, day case and non-admitted care settings. However, it does not include any activity included in a Pain Management Programme found within Subchapter **AB Pain Management**.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**11**	**8**
Total HRG Roots	**8**	**8**
Procedure-driven HRGs	11	8
Diagnosis-driven HRGs	0	0
Age Splits	No	No
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	No	No
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	No	No
Length of Stay-qualified	Yes	Yes

The activity mapped to this subchapter is separate from the spinal and orthopaedic procedures mapped to Chapter **H Musculoskeletal System**, and the other non-vascular imaging interventions found in the other subchapters within Chapter **Y Vascular Procedures and Disorders and Imaging Interventions**.

The HRGs are specific to the type of musculoskeletal imaging intervention performed, and include HRGs specific to ablative procedures, vertebroplasty, aspiration and biopsies.

The vertebroplasty HRGs are differentiated based on levels of spine – one; two; or three or more levels.

With the exception of the vertebroplasty and ablative procedure HRGs, all HRGs within this subchapter employ maximum length of stay logic to ensure that relatively minor procedures such as biopsies are not used to determine the HRG for a long stay medical patient, e.g. a person who has metastatic bone cancer.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

New HRGs have been created/ Existing HRGs deleted

Paediatric age splits have been added to the aspiration and biopsy HRGs within this subchapter to reflect the additional resource usage associated with treating children. This includes the deletion of the existing three HRGs (**YH30Z Image Guided Aspiration of Joint**, **YH31Z Image Guided Biopsy of Lesion of Bone** and **YH32Z Image Guided Biopsy of, Lesion of Muscle or Connective Tissue**) to create six new HRGs;

- **YH30A Percutaneous Aspiration of Joint, 19 years and over**
- **YH30B Percutaneous Aspiration of Joint, 18 years and under**
- **YH31A Percutaneous Biopsy of Lesion of Bone, 19 years and over**
- **YH31B Percutaneous Biopsy of Lesion of Bone, 18 years and under**
- **YH32A Percutaneous Biopsy of, Lesion of Muscle or Connective Tissue, 19 years and over**
- **YH32B Percutaneous Biopsy of, Lesion of Muscle or Connective Tissue, 18 years and under**

Remapping of codes to more appropriately reflect resource usage

A new combination code, ***W094+Y123 Percutaneous irreversible electroporation of lesion of bone***, has been created specific to this procedure to ensure all types of percutaneous ablation procedures on bones map to **YH20Z Percutaneous Ablation of Lesion of Bone**.

Cosmetic changes to labels or descriptions

The labels of the HRGs within this subchapter have been amended for clarity to state “Percutaneous” rather than “Image Guided”. This reflects the fact that although these procedures would be expected to typically be performed under image guidance, there is no logic check for OPCS-4 subsidiary image guidance codes in the patient record, therefore ‘percutaneous’ more accurately reflects the HRG content.

Subchapter YJ – Breast Imaging Interventions

Subchapter **YJ Breast Imaging Interventions** covers breast imaging interventions for patients of all ages. It includes activity undertaken in inpatient, day case and non-admitted care settings.

This activity is separate from the open breast procedures mapped to Subchapter **JA Breast Procedures and Disorders**, and the other non-vascular imaging interventions found in the other subchapters within Chapter **Y Vascular Procedures and Disorders and Imaging Interventions**.

The HRGs are specific to the type of breast imaging intervention performed, and include HRGs specific to various types of biopsies and aspirations.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**9**	**12**
Total HRG Roots	**9**	**12**
Procedure-driven HRGs	9	12
Diagnosis-driven HRGs	0	0
Age Splits	No	No
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

All of the HRGs in this subchapter employ multiple procedure logic to take account of the additional resource usage of patients that undergo multiple biopsies or aspirations, e.g. bilateral interventions.

All HRGs within this subchapter have maximum length of stay logic to ensure that relatively minor procedures such as biopsies are not used to determine the HRG for a long stay medical patient, e.g. a person who has metastatic breast cancer.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

New HRGs have been created/ Existing HRGs deleted

Several of the HRGs within this subchapter have been redesigned to more appropriately reflect clinical care. This includes the deletion of HRGs that differentiate unilateral and bilateral procedures in favour of distinguishing by the type of image control (x-ray versus ultrasound guidance, and core versus fine needle aspiration biopsy). This redesign has led to the deletion of five HRGs (**YJ01Z Bilateral Core Needle Biopsy of Lesions of Breasts**, **YJ02Z Unilateral Core Needle Biopsy of Lesion of Breast**, **YZ05Z Bilateral Fine Needle Aspiration of Lesions of Breasts**, **YJ06Z Unilateral Fine Needle Aspiration of Lesion of Breast**, **YJ07Z Fine Needle Aspiration of Lesion of Breast and Associated Lymph Nodes**) to be replaced with three new ones:

- **YJ13Z Ultrasound Guided Core Needle Biopsy of Lesions of Breast**
- **YJ14Z Stereotactic Core Needle Biopsy of Lesion of Breast**
- **YJ15Z Fine Needle Aspiration of Lesion of Breast**

Core needle biopsy procedures will default to HRG **YJ13Z Ultrasound Guided Core Needle Biopsy of Lesions of Breast** and will map to **YJ14Z Stereotactic Core Needle Biopsy of Lesion of Breast** if a subsidiary code indicating a stereotactic biopsy or under radiological (x-ray) control is recorded.

HRGs have been deleted

YJ10Z Wire Guided Biopsy of Lesion of Breast has been deleted from this subchapter to reflect that this is a surgical procedure, rather than imaging intervention. As such, the activity now maps to HRGs within Subchapter **JA Breast Procedures and Disorders**.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

Within this subchapter new code ***B324 Vacuum biopsy of lesion of breast*** has been mapped to**YJ09Z Vacuum Assisted Biopsy of Lesion of Breast** to reflect that this HRG is specific to this procedure. This has resulted in the deletion of the two combination codes that previously mapped to this HRG, as these are now redundant due to the creation of this new OPCS-4.8 code which replaces them.

Cosmetic changes to labels or descriptions

The labels of the HRGs within this subchapter have been amended for clarity to reflect content.

Subchapter YL – Urological Imaging Interventions

Subchapter **YL Urological Imaging Interventions** covers urological interventions for patients of all ages. It includes activity undertaken in inpatient, day case and non-admitted care settings.

This activity is separate from the open urological procedures mapped to Subchapter **LB Urological and Male Reproductive System Procedures and Disorders**, and the other non-vascular imaging interventions found in the other subchapters within Chapter **Y Vascular Procedures and Disorders and Imaging Interventions**.

The HRGs within this subchapter are specific to the type of urological imaging intervention performed, and include distinct HRGs for biopsies and ablative procedures, as well as insertion of stent and nephrostomy procedures.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**9**	**8**
Total HRG Roots	**8**	**7**
Procedure-driven HRGs	9	8
Diagnosis-driven HRGs	0	0
Age Splits	Yes	Yes
Complications and Comorbidities Splits	No	No
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	No	No
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

The insertion of stent and nephrostomy HRGs employ multiple procedure logic to take account of the additional expected resource usage of patients that have multiple stents inserted or undergo multiple drainage interventions, including bilateral procedures.

With the exception of the ablative procedure HRGs, all HRGs within this subchapter employ maximum length of stay logic to ensure that relatively minor procedures such as insertion of nephrostomy are not used to determine the HRG for a long stay medical patient, e.g. a person who has chronic kidney disease.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

New HRGs have been created

A new HRG, **YL30Z Percutaneous Ablation of Lesion of Prostate** has been created to enable all types of percutaneous ablation procedures on the prostate to be separately identified.

Remapping of codes to more appropriately reflect resource usage

A new combination code, ***M718+Y123 Percutaneous irreversible electroporation of lesion of prostate***, has been created specific to this procedure, mapping to the new **YL30Z Percutaneous Ablation of Lesion of Prostate** HRG.

New combination codes, ***M138+Y123 Percutaneous irreversible electroporation of lesion of kidney*** and **M138+MIC Percutaneous microwave ablation of lesion of kidney** have been created specific to these procedures, to ensure all types of percutaneous ablation

procedures on the kidney map to the appropriate HRG. The former has been mapped to **YL01Z Percutaneous Cryoablation of Lesion of Kidney**, which has been relabelled **YL01Z Complex Percutaneous Ablation of Lesion of Kidney** to clarify that cryoablation and irreversible electroporation are complex ablations. The latter has been mapped to **YL02Z Percutaneous, Microwave or Radiofrequency Ablation, of Lesion of Kidney** which has been relabelled **YL02Z Standard Percutaneous Ablation of Lesion of Kidney**, to clarify that radiofrequency and microwave ablations are considered standard in the HRG design.

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

Within this subchapter OPCS-4 code ***M13.8 Other specified percutaneous puncture of kidney and M15.8 Other specified operations on kidney along nephrostomy tube track*** have been remapped from base HRG root **YL11 Unilateral, Percutaneous Insertion of, Ureteric Stent or Nephrostomy** to **YL21 Other Percutaneous Urinary Tract Procedures** to reflect that these are not necessarily drainage procedures. A new combination code ***M158+STENT Insertion of stent along nephrostomy tube track*** has been created and mapped to base HRG root **YL11 Unilateral, Percutaneous Insertion of, Ureteric Stent or Nephrostomy**, to reflect the nature of this procedure.

Subchapter YQ – Vascular Open Procedures and Disorders

Subchapter **YQ Vascular Open Procedures and Disorders** covers vascular open procedures for patients of all ages and adult disorders. It includes activity undertaken in inpatient, day case and non-admitted care settings.

This activity is separate from the interventions that map to **YR Vascular Imaging Interventions**.

The HRGs within this Subchapter are split based on the site of the blood vessel, e.g. abdominal, lower limb, upper limb; however, there are also procedure-specific HRGs, e.g. for amputation procedures and varicose vein surgery.

Multiple procedure logic is employed within the majority of HRGs within this subchapter.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**64**	**60**
Total HRG Roots	**29**	**27**
Procedure-driven HRGs	53	49
Diagnosis-driven HRGs	11	11
Age Splits	No	No
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

In addition, escalation to an HRG with a higher expected resource usage also occurs, where appropriate, if a procedure is revisional or undertaken bilaterally.

The minor procedure HRGs, e.g. varicose vein surgery and vascular access procedures, have maximum length of stay logic to ensure that minor procedures such as arteriovenous (AV) fistula insertion are not used to determine the HRG for a long stay medical patient, e.g. a person who has chronic kidney disease.

There are two adult diagnosis-driven HRG roots within this subchapter, one specific to deep vein thrombosis (DVT) and another that covers all other peripheral vascular disease.

Interactive CC splits are employed within the majority of the HRGs within this subchapter – up to a maximum of six levels – to more appropriately differentiate expected resource usage between routine and complex patients.

All diagnosis-driven activity relating to the treatment of children (aged 18 years and under) groups to an HRG in **Chapter P Diseases of Childhood and Neonates**, in line with the requirements of the Casemix Design Framework.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

New HRGs have been created

A cross-chapter review of aortic aneurysm repair has led to the redesign of HRGs within Subchapters **ED Open Cardiac Procedures for Acquired Conditions**, **YQ Vascular Open Procedures and Disorders** and **YR Vascular Imaging Interventions**. Within this subchapter this has led to the deletion of five HRGs (**YQ01A/B Multiple or Revisional, Open Repair of, Abdominal or Thoracoabdominal Aortic Aneurysm**, **YQ02Z Open**

Repair of Thoracoabdominal Aortic Aneurysm, **YQ03A/B Open Repair of Abdominal Aortic Aneurysm**) to be replaced with eight new HRGs, a net increase of three HRGs:

- **YQ06Z Open Repair of Thoracoabdominal Aortic Aneurysm**
- **YQ07A Open Repair of Suprarenal Aortic Aneurysm, with CC Score 7+**
- **YQ07B Open Repair of Suprarenal Aortic Aneurysm, with CC Score 0-6**
- **YQ08A Complex Open Repair of Abdominal Aortic Aneurysm with CC Score 7+**
- **YQ08B Complex Open Repair of Abdominal Aortic Aneurysm with CC Score 0-6**
- **YQ09A Standard Open Repair of Abdominal Aortic Aneurysm with CC Score 7+**
- **YQ09B Standard Open Repair of Abdominal Aortic Aneurysm with CC Score 4-6**
- **YQ09C Standard Open Repair of Abdominal Aortic Aneurysm with CC Score 0-3**

These HRGs better differentiate between the type of aortic aneurysm being repaired; abdominal aortic aneurysm, suprarenal aortic aneurysm and thoracoabdominal aneurysms, as the repair of the different types of aneurysm differs significantly in both clinical and resource terms.

In addition the abdominal aneurysms are separated into standard and complex. The latter reached via escalation if;

- the procedure is revisional or,
- if the patient has a cardiovascular infection (to match the “escalation” logic for thoracic aortic aneurysm repair) or,
- if the patient has an aortic dissection or,
- if an additional procedure indicating bypass of iliac or femoral artery or replantation of renal or visceral arteries is recorded.

Combination code ***L671+NECK Biopsy of artery NEC of neck*** has been deleted and replaced with combination code ***L671+O121 Biopsy of temporal artery***, which has been mapped to a new procedure-specific HRG **YQ43Z Biopsy of Temporal Artery** to reflect that this is a common vascular procedure, which has a different expected resource usage to any of the other existing HRGs within this subchapter. This will result in a shift of activity from HRG root **CA05 Minor Neck Procedures** to this new HRG.

Changes made to logic

The complications and comorbidities (CC) lists relating to imaging intervention subchapters, FDFEFFYF_CC, GAGBGCYG_CC and YAYQYR_CC, have been updated to include paediatric-specific CCs such as disorders of prematurity and autistic spectrum disorders to reflect the additional resource usage associated with treating patients with these underlying conditions.

Subchapter YR – Vascular Imaging Interventions

Subchapter **YR Vascular Imaging Interventions** covers vascular imaging interventions for patients of all ages. It includes activity undertaken in inpatient, day case and non-admitted care settings.

This activity is separate from the open vascular procedures and non-vascular imaging interventions found in the other subchapters within Chapter **Y Vascular Procedures and Disorders and Imaging Interventions**.

This subchapter consists of HRGs specific to endovascular aortic aneurysm repair (EVAR), angioplasty and stenting, embolisation, varicose vein interventions, vascular access procedures and other percutaneous diagnostic or therapeutic vascular interventions.

Composition and Concepts		
	RC17/18	RC16/17
Total HRGs	**74**	**58**
Total HRG Roots	**42**	**37**
Procedure-driven HRGs	74	58
Diagnosis-driven HRGs	0	0
Age Splits	Yes	Yes
Complications and Comorbidities Splits	Yes	Yes
Intervention Splits	No	No
Multiple Procedures	Yes	Yes
Procedure Combination Codes	Yes	Yes
Diagnosis-qualified	Yes	Yes
Subsidiary Procedure-qualified	Yes	Yes
Length of Stay-qualified	Yes	Yes

Multiple procedure logic is employed within the majority of therapeutic HRGs within this subchapter. In addition, escalation to a higher expected resource HRG also occurs where there are certain types of stents or stent grafts used, depending on type of aneurysm, and where appropriate if a procedure is undertaken bilaterally.

Age splits are employed in several of the vascular access HRGs: there are specific HRGs for adult activity (19 years and over) and others for paediatric activity (18 years and under).

The minor procedure HRGs, e.g. varicose vein interventions, vascular access procedures and diagnostic imaging interventions, have maximum length of stay logic to ensure that minor procedures such as CV catheter insertion are not used to determine the HRG for a long stay medical patient, e.g. a person who is receiving treatment for cancer.

Interactive CC splits are employed within several of the therapeutic vascular imaging intervention HRGs within this subchapter – up to a maximum of four levels – to more appropriately differentiate expected resource usage between routine and complex patients.

Differences from the HRG4+ 2016/17 Reference Costs Grouper

New HRGs have been created/ Existing HRGs deleted

A cross-chapter review of aortic aneurysm repair has led to the redesign of HRGs within Subchapters **ED Open Cardiac Procedures for Acquired Conditions**, **YQ Vascular Open Procedures and Disorders** and **YR Vascular Imaging Interventions**. Within this subchapter this has led to the deletion of four HRGs (**YR01Z Complex Endovascular Repair of, Thoracic or Thoracoabdominal Aortic Aneurysm**, **YR02Z Endovascular Repair of, Thoracic or Thoracoabdominal Aortic Aneurysm**, **YR03Z Complex Endovascular Repair of Abdominal Aortic Aneurysm**, **YR04Z Endovascular Repair of**

Abdominal Aortic Aneurysm) to be replaced with 14 new HRGs, a net increase of ten HRGs:

- **YR60Z Complex Endovascular Repair of Thoracoabdominal Aortic Aneurysm using Branched Stent Graft**
- **YR61Z Standard Endovascular Repair of Thoracoabdominal Aortic Aneurysm using Branched Stent Graft**
- **YR62A Complex Endovascular Repair of Thoracoabdominal Aortic Aneurysm using Fenestrated Stent Graft, with CC Score 6+**
- **YR62B Complex Endovascular Repair of Thoracoabdominal Aortic Aneurysm using Fenestrated Stent Graft, with CC Score 0-5**
- **YR63A Standard Endovascular Repair of Thoracoabdominal Aortic Aneurysm using Fenestrated Stent Graft, with CC Score 6+**
- **YR63B Standard Endovascular Repair of Thoracoabdominal Aortic Aneurysm using Fenestrated Stent Graft, with CC Score 0-5**
- **YR64A Complex Endovascular Repair of Thoracic Aortic Aneurysm, with CC Score 6+**
- **YR64B Complex Endovascular Repair of Thoracic Aortic Aneurysm, with CC Score 0-5**
- **YR65A Standard Endovascular Repair of Thoracic Aortic Aneurysm, with CC Score 6+**
- **YR65B Standard Endovascular Repair of Thoracic Aortic Aneurysm, with CC Score 0-5**
- **YR66A Complex Endovascular Repair of Abdominal Aortic Aneurysm, with CC Score 6+**
- **YR66B Complex Endovascular Repair of Abdominal Aortic Aneurysm, with CC Score 0-5**
- **YR67A Standard Endovascular Repair of Abdominal Aortic Aneurysm, with CC Score 6+**
- **YR67B Standard Endovascular Repair of Abdominal Aortic Aneurysm, with CC Score 0-5**

These HRGs better differentiate between the type of aortic aneurysm being repaired; thoracic, abdominal or thoracoabdominal aneurysms, as the repair of the different types of aneurysm differs significantly in both clinical and expected resource terms, in addition to the type of stent graft used i.e. standard, branched or fenestrated. This has resulted in the creation of new combination codes specific to the type of aneurysm repairs and both type and number of stents used.

In addition the endovascular abdominal aneurysms repair HRGs are separated into standard and complex. The latter reached via escalation if an additional procedure is recorded alongside that indicates;

- arterial bypass, e.g. bypass of iliac artery or,
- arterial stenting, e.g. stenting of subclavian artery or,
- conduit formation for access or,
- arterial embolisation, e.g. embolisation of renal artery or,
- three or more stent grafts are used – e.g. additional arteries are stented.

Paediatric age splits, including those for older and younger children have been added to the vascular access HRGs within this subchapter to reflect the additional expected resource

usage associated with treating children, in particular the general anaesthetic requirement often associated with procedures on preschool children. This includes the deletion of the existing five HRGs (**YR40B Insertion of Non-Tunnelled Central Venous Catheter, 18 years and under**, **YR42B Peripheral Insertion of Central Venous Catheter, 18 years and under**, **YR43B Attention to Central Venous Catheter, 18 years and under**, **YR44B Removal of Central Venous Catheter, 18 years and under**, **YR45Z Insertion of Subcutaneous Port**) to create ten new HRGs, a net increase of five HRGs:

- **YR40C Insertion of Non-Tunnelled Central Venous Catheter, between 6 and 18 years**
- **YR40D Insertion of Non-Tunnelled Central Venous Catheter, 5 years and under**
- **YR42C Peripheral Insertion of Central Venous Catheter, between 6 and 18 years**
- **YR42D Peripheral Insertion of Central Venous Catheter, 5 years and under**
- **YR43C Attention to Central Venous Catheter, between 6 and 18 years**
- **YR43D Attention to Central Venous Catheter, 5 years and under**
- **YR44C Removal of Central Venous Catheter, between 6 and 18 years**
- **YR44D Removal of Central Venous Catheter, 5 years and under**
- **YR45A Insertion of Subcutaneous Port, 19 years and over**
- **YR45B Insertion of Subcutaneous Port, 18 years and under**

A new combination code ***L758+SCLR Sclerotherapy to arteriovenous malformation*** has been created and mapped to a new HRG created specific to this procedure; **YR58Z Injection Sclerotherapy of Peripheral Arteriovenous Malformation**.

Changes made to logic

The complications and comorbidities (CC) lists relating to imaging intervention subchapters, FDFEFFYF_CC, GAGBGCYG_CC and YAYQYR_CC, have been updated to include paediatric-specific CCs such as disorders of prematurity and autistic spectrum disorders to reflect the additional resource usage associated with treating patients with these underlying conditions.

Changes made to accommodate OPCS-4.8 update

Changes to the procedure classification OPCS-4, implemented from 1 April 2017, have been incorporated within the HRG4+ design.

Within this subchapter new code ***L86.3 Injection of glue into varicose vein of leg*** has been mapped to base HRG root **YR31 Percutaneous Transluminal, Laser or Radiofrequency Ablation, of Unilateral Varicose Veins** to reflect that this procedure is most similar in resource terms to ablation procedures.

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.