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Chapter Summaries

HRG4+ 2016/17 Reference Costs Grouper

RC 16/17

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Contents

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 **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		
	RC16/17	RC15/16
Total HRGs	**101**	**98**
Total HRG Roots	**29**	**27**
Procedure-driven HRGs	51	49
Diagnosis-driven HRGs	50	49
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+ 2015/16 Reference Costs Grouper

New HRGs have been created

Two new HRGs have been created to specifically identify the resources associated with specialised intracranial telemetry, in particular in relation to the cost of the depth and surface electrodes. These are **AA83Z Intracranial Telemetry** and **AA82Z Intracranial Telemetry, with Cortical Mapping or Resection of Brain**.

In addition, two new HRGs have been created to identify adult patients treated for Sleeping Disorders, excluding Sleep Apnoea, which are differentiated by the presence of complications and comorbidities; **AA43A Sleep Disorders, excluding Sleep Apnoea, with CC Score 2+** and **AA43B Sleep Disorders, excluding Sleep Apnoea, with CC Score 0-1**. The majority of this activity previously mapped to HRGs in **WD Treatment of Mental Health Patients by Non-Mental Health Service Providers**.

HRGs have been deleted

As a result of the redesign of Subchapter **WD Treatment of Mental Health Patients by Non-Mental Health Service Providers**, activity that previously mapped to **AA27Z Medical Care of Patients with Alzheimer's Disease** now more rightly maps to **WD02Z Alzheimers Disease or Dementia, treated by a Non-Specialist Mental Health Service Provider**. As a result, **AA27Z Medical Care of Patients with Alzheimer's Disease** has been deleted from Subchapter AA.

Changes made to logic

Logic has been amended on procedures codes that map to a base HRG root of **AA54 Intermediate Intracranial Procedures, 19 years and over** to ensure that paediatric activity appropriately maps to HRG root **AA56 Minor or Intermediate, Intracranial Procedures, 18 years and under**.

Logic has been amended to ensure that where the primary diagnosis relates to a complication or adjustment of neurostimulator but the secondary diagnosis indicates that the device has been inserted for the treatment of faecal or urinary incontinence or for pain management, this activity will map to the appropriate HRGs in Subchapters **FF Digestive System Open and Laparoscopic Procedures**, **LB Urological and Male Reproductive System Procedures and Disorders** and **AB Pain Management**, rather than defaulting to the **AA60* Insertion of Neurostimulator for Treatment of Neurological Conditions** HRGs.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
Total HRGs	**13**	**13**
Total HRG Roots	**13**	**13**
Procedure-driven HRGs	13	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 only 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+ 2015/16 Reference Costs Grouper

Changes made to logic

Logic has been amended to ensure that where the primary diagnosis relates to complication or adjustment of neurostimulator but secondary diagnosis indicates that the device has been inserted for pain management, this groups to the appropriate HRGs in this subchapter, rather than defaulting to the **AA60* Insertion of Neurostimulator for Treatment of Neurological Conditions** HRGs.

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		
	RC16/17	**RC15/16**
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 enable HRGs specific to the treatment of young children (0 to 3 years of age). 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+ 2015/16 Reference Costs Grouper

Changes made to logic

Grouping logic applied to OPCS-4 procedure codes that map to base HRG roots of **BZ54 Major, Orbit or Lacrimal Procedures, 19 years and over** and **BZ83 Very Major Vitreous Retinal Procedures, 19 years and over** have been amended to ensure that paediatric activity maps to HRG root **BZ85 Very Major or Major, Vitreous Retinal Procedures, 18 years and under**.

Remapping of codes to more appropriately reflect resource usage

OPCS-4 procedure code **C46.4 Insertion of prosthesis into cornea** is used to code several different corneal procedures, according to the National Institute for Health and Care Excellence (NICE) interventional procedure guidance. However, C46.4 is most commonly used to record the procedure Corneal implants for keratoconus, which has a lower expected resource use than the other procedures coded using the same OPCS-4 code – the primary diagnosis recorded alongside **C46.4** in the patient record enables the specific procedure coded using this OPCS-4 code to be identified. To reflect the fact that **C46.4 Insertion of prosthesis into cornea** is primarily used to identify a procedure performed to treat patients with a primary diagnosis of keratoconus, and in line with Expert Working Group advice, **C46.4 Insertion of prosthesis into cornea** has been remapped from a base HRG root of **BZ60 Very Complex, Cornea or Sclera Procedures** to a base HRG root of **BZ61 Complex, Cornea or Sclera Procedures**.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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.

Composition and Concepts		
	RC16/17	RC15/16
Total HRGs	**120**	**120**
Total HRG Roots	**70**	**70**
Procedure-driven HRGs	120	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 of the 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.

Most 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+ 2015/16 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

In order to accommodate the latest NICE guidance in the HRG4+ design, the combination code **E28.1+Y76.3 Endoscopic cricopharyngeal myotomy** has been created and mapped to HRG root **CA67 Complex Therapeutic Endoscopic, Larynx or Pharynx Procedures**.

Also, OPCS-4 code **V20.1 Total prosthetic replacement of temporomandibular joint** has been remapped from **CA94* Intermediate Maxillofacial Procedures** to **CA93* Major Maxillofacial Procedures** to better reflect the expected resource use associated with this procedure.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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

Subchapter **CB Ear, Nose, Mouth, Throat and Neck Disorders** include 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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

Grouping logic applied to ICD-10 codes identifying a burn or corrosion of the mouth or pharynx has been revised following a global review of burns logic. ICD-10 codes **T28.0 Burn of mouth and pharynx** and **T28.5 Corrosion of mouth and pharynx** have been remapped to HRG root **CB02 Non-Malignant, Ear, Nose, Mouth, Throat or Neck Disorders** for adult activity and to **PV32 Paediatric Minor Injury without Intracranial Injury** for paediatric activity. Previously, the presence of one of these codes in the patient record resulted in a burns HRG from Subchapter JB being generated for the episode.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 Reference Costs Grouper.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

In accordance with NICE guidance a new combination code has been created for the insertion of endobronchial nitinol coils and mapped to the appropriate HRG within this subchapter – **DZ66Z Complex Therapeutic Bronchoscopy**.

Also, OPCS-4 code **W92.5 Other examination of joint** has been removed as a significant procedure for Core 1 (standard) grouping. For episodes or attendances where **W92.5 Other examination of joint** is the only or dominant procedure, grouping will be diagnosis-driven or to an outpatient attendance (WF*) HRG, respectively.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 Reference Costs Grouper.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

In accordance with NICE guidance new combination codes have been created for transcatheter mitral valve-in-valve implantation and transcatheter valve-in-valve implantation for aortic bioprosthetic valve and mapped to the appropriate HRG root within this subchapter – **EC10 Very Complex Procedures for Congenital Heart Disease**.

Also, OPCS-4 code **L13.5 Percutaneous transluminal balloon angioplasty of pulmonary artery NEC** has been appropriately remapped directly to HRGs within this subchapter, irrespective of age or diagnosis of the patient, to reflect that this procedure is almost exclusively performed to treat patients with congenital heart disease.

Implantation or renewal of biventricular pacemakers have been remapped to a base HRG root of **EC14 Intermediate Procedures for Congenital Heart Disease** to reflect the additional resources associated with this device, over and above single or dual pacemakers.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
Total HRGs	**48**	**46**
Total HRG Roots	**24**	**20**
Procedure-driven HRGs	48	46
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+ 2015/16 Reference Costs Grouper

New HRGs have been created

The cardiac transplant HRGs have been redesigned to reflect current clinical practice. The new HRGs differentiate between Standard and Complex transplantation, the latter involving previous mechanical assistance or for treatment of congenital heart disease or amyloidosis.

The HRGs also differentiate between patients receiving short-term bridge-to-transplant transplant ventricular assistance devices (VAD), with or without transplant, during the same

stay in hospital, and patients having complex or standard insertion of long-term bridge-to-transplant VAD.

HRGs have been deleted

As a result of the redesign of the Heart Transplant and Implantation of Prosthetic Heart or Ventricular Assist Device HRGs, the existing four HRGs describing this activity have been deleted.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
Total HRGs	65	65
Total HRG Roots	26	26
Procedure-driven HRGs	65	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 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+ 2015/16 Reference Costs Grouper

New HRGs have been created to replace existing HRGs

The attention to / removal of pacemaker or cardioverter defibrillator HRGs have been redesigned to separately identify complex extraction procedures from simple explantation

procedures. This has led to the deletion of the four existing HRGs and the creation of four new HRGs – with simple explantation and “attention to” procedures mapped to the same HRGs, further differentiated by CC score..

Remapping of codes to more appropriately reflect resource usage

In accordance with NICE guidance new combination codes have been created for transcatheter mitral valve-in-valve implantation and transcatheter valve-in-valve implantation for aortic bioprosthetic valve and mapped to the TAVI HRGs.
Also, OPCS-4 code **L13.5 Percutaneous transluminal balloon angioplasty of pulmonary artery NEC** has been appropriately remapped from this subchapter directly to HRGs within Subchapter **EC Open and Interventional Procedures for Congenital Heart Disease** irrespective of age or diagnosis of the patient, to reflect that this procedure is almost exclusively performed to treat patients with congenital heart disease.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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 at times where the presence of multiple interventions influences grouping, are employed within all of the HRG roots in this subchapter.

Composition and Concepts		
	RC16/17	RC15/16
Total HRGs	**54**	**0**
Total HRG Roots	**7**	**0**
Procedure-driven HRGs	0	N/A
Diagnosis-driven HRGs	54	N/A
Age Splits	No	N/A
Complications and Comorbidities Splits	Yes	N/A
Intervention Splits	Yes	N/A
Multiple Procedures	No	N/A
Procedure Combination Codes	No	N/A
Diagnosis-qualified	No	N/A
Subsidiary Procedure-qualified	No	N/A
Length of Stay-qualified	No	N/A

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+ 2015/16 Reference Costs Grouper

The subchapter has been redesigned

Subchapter **FZ Digestive System Procedures and Disorders** has been retired and replaced by three separate subchapters because the subchapter could not be expanded due to a lack of available codes. The three new subchapters are **FD Digestive System Disorders**, **FE Digestive System Endoscopic Procedures** and **FF Digestive System Open and Laparoscopic Procedures**.

FD Digestive System Disorders comprises 54 diagnosis-driven HRGs across seven HRG roots. These roots cover malignant disorders, non-malignant disorders and five other disorder types: gastrointestinal infections, gastrointestinal bleed, inflammatory bowel disease, nutritional disorders and abdominal pain.

The HRGs in this subchapter are identical to the HRGs with the same code description in the HRG4+ 2015/16 Reference Costs design except where affected by changes resulting from the implementation of ICD-10 5th Edition or the remapping of ICD-10 codes related to burns or corrosions of the gastrointestinal tract.

Remapping of codes to more appropriately reflect resource usage

Grouping logic applied to ICD-10 codes identifying a burn or corrosion of the oesophagus or other parts of the alimentary tract has been revised following a global review of burns logic. ICD-10 codes **T28.1 Burn of oesophagus**, **T28.2 Burn of other parts of alimentary tract**, **T28.6 Corrosion of oesophagus** and **T28.7 Corrosion of other parts of alimentary tract** have been remapped to HRG root **FD10 Non-Malignant Gastrointestinal Tract Disorders** for adult activity and to **PV32 Paediatric Minor Injury without Intracranial Injury** for paediatric activity. Previously, the presence of one of these codes in the patient record resulted in a burns HRG from Subchapter JB being generated for the episode.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
Total HRGs	**37**	**0**
Total HRG Roots	**22**	**0**
Procedure-driven HRGs	37	N/A
Diagnosis-driven HRGs	0	N/A
Age Splits	Yes	N/A
Complications and Comorbidities Splits	Yes	N/A
Intervention Splits	No	N/A
Multiple Procedures	Yes	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

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+ 2015/16 Reference Costs Grouper

The subchapter has been redesigned

Subchapter **FZ Digestive System Procedures and Disorders** has been retired and replaced by three separate subchapters because the subchapter could not be expanded due

to a lack of available codes. The three new subchapters are **FD Digestive System Disorders**, **FE Digestive System Endoscopic Procedures** and **FF Digestive System Open and Laparoscopic Procedures**.

FE Digestive System Endoscopic Procedures comprises 37 procedure-driven HRGs across 22 HRG roots and includes therapeutic and diagnostic endoscopic upper and lower gastrointestinal tract procedures. Some endoscopic procedures have been mapped to **FF Digestive System Open and Laparoscopic Procedures** where it was determined that their expected resource use was akin to clinically similar digestive system procedures performed laparoscopically or where it was decided to keep clinically similar activity within the same subchapter, e.g., procedures undertaken to treat obesity.

The HRGs in this subchapter are identical to the HRGs with the same code description in the HRG4+ 2015/16 Reference Costs design.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
Total HRGs	112	0
Total HRG Roots	35	0
Procedure-driven HRGs	112	N/A
Diagnosis-driven HRGs	0	N/A
Age Splits	Yes	N/A
Complications and Comorbidities Splits	Yes	N/A
Intervention Splits	No	N/A
Multiple Procedures	Yes	N/A
Procedure Combination Codes	Yes	N/A
Diagnosis-qualified	Yes	N/A
Subsidiary Procedure-qualified	Yes	N/A
Length of Stay-qualified	Yes	N/A

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 **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+ 2015/16 Reference Costs Grouper

The subchapter has been redesigned

Subchapter **FZ Digestive System Procedures and Disorders** has been retired and replaced by three separate subchapters because the subchapter could not be expanded due to a lack of available codes. The three new subchapters are **FD Digestive System Disorders**, **FE Digestive System Endoscopic Procedures** and **FF Digestive System Open and Laparoscopic Procedures**.

FF Digestive System Open and Laparoscopic Procedures comprises 112 procedure-driven HRGs across 35 HRG roots and includes open and laparoscopic upper and lower gastrointestinal tract procedures. Some endoscopic procedures have been mapped to **FF Digestive System Open and Laparoscopic Procedures** where it was determined that their expected resource use was akin to clinically similar digestive system procedures performed laparoscopically or where it was decided to keep clinically similar activity within the same subchapter, e.g., procedures undertaken to treat obesity.

The HRGs in this subchapter are identical to the HRGs of the same name in the HRG4+ 2015/16 Reference Costs design except for the following:

New HRGs have been created to replace existing HRGs

FZ Digestive System Procedures and Disorders had four HRGs specific to obesity. These have been replaced by five new HRG specific to obesity: **FF14Z Adjustment of Gastric Band for Obesity**, **FF13Z Gastric Band Procedures for Obesity**, **FF12Z Sleeve Gastrectomy for Obesity**, **FF11Z Major Surgical Procedures for Obesity** and **FF10Z Complex Surgical Procedures for Obesity**. The new design retains a procedure-specific HRG for adjustment of gastric band, but this HRG no longer includes laparoscopic maintenance of gastric band activity, which now maps to **FF13Z**. The new design also introduces HRGs specific to sleeve gastrectomy and gastric band procedures, respectively, and it includes a two-tiered complexity range for surgical procedures undertaken to treat obesity. **FF11Z** and **FF10Z** are diagnosis-qualified – only activity with a primary diagnosis of obesity will group to these HRGs – and the less resource intensive of these HRGs includes multiple-procedure logic that enables activity to escalate to the more complex HRG where multiple significant procedures have been undertaken.

Changes made to logic

Logic applied to OPCS-4 procedure codes for the insertion or renewal of neurostimulator or the insertion or renewal of neurostimulator electrodes mapped to HRG roots in Subchapter

AA Nervous System Procedures and Disorders has been amended to ensure that patients being treated for faecal incontinence group to either **FF47Z Insertion of Neurostimulator for Treatment of Faecal Incontinence** or **FF48Z Insertion of Neurostimulator Electrodes for Treatment of Faecal Incontinence** rather than defaulting to an HRG root in Subchapter AA.

Remapping of codes to more appropriately reflect resource usage

In order to accommodate the latest NICE guidance in the HRG4+ design, the combination code **H20.6 + Y75.2 Combined endoscopic and laparoscopic resection of lesion of colon** has been created and mapped to HRG root **FF33 Distal Colon Procedures, 19 years and over**.

A new combination code has also been created to identify abdominal wall transplant, **T31.8+Y01.- Transplantation of abdominal wall**, and has been mapped to HRG root **FF50 Complex General Abdominal Procedures**. An episode or spell with a dominant procedure code of **T31.8+Y01.-** and a secondary procedure code identifying another abdominal transplant procedure will escalate to HRG **GA14Z Multi-Organ or Multiple Transplants**.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

ICD-10 5th Edition introduces three new codes specific to parastomal hernia: **K43.3 Parastomal hernia with obstruction, without gangrene**; **K43.4 Parastomal hernia with gangrene**; and **K43.5 Parastomal hernia without obstruction or gangrene**. In the HRG4+ design, where an OPCS-4 procedure code indicating repair of hernia is recorded alongside a diagnosis of parastomal hernia, the episode or spell is escalated to a higher resource HRG root as a repair of a parastomal hernia is expected to consume a greater level of resource than other types of hernia repair.

The HRG4+ design previously looked for a diagnosis of ventral hernia plus a **Z93.-** code identifying artificial external opening to identify a parastomal hernia.

The new codes eliminate the need for the old parastomal hernia logic and enable a more direct way of identifying a diagnosis of parastomal hernia. The grouper logic has been amended to acknowledge this, but the end result remains the same: a repair of a parastomal hernia will still group to **FF60* Complex Hernia Procedures**.

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		
	RC16/17	RC15/16
Total HRGs	**27**	**26**
Total HRG Roots	**11**	**10**
Procedure-driven HRGs	27	26
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+ 2015/16 Reference Costs Grouper

New HRGs have been created to replace existing HRGs

HRG root **GA01 Hepatobiliary Transplant** has been deleted and replaced by **GA15* Liver Transplant** and **GA16Z Pancreas Transplant** in order to separate liver transplant activity from pancreas transplant activity. Since a pancreas transplant is frequently carried out

alongside a kidney transplant, pancreas + kidney transplant activity also maps to HRG **GA16Z**.

HRG root **GA15** includes an age split as well as a paediatric age split in order to separate paediatric activity from adult activity and infant activity from older paediatric activity, respectively. HRG **GA16Z** does not include any splits as pancreas transplants contain relatively low volumes of paediatric patients.

All OPCS-4 codes mapped to HRGs **GA15*** and **GA16Z** include multiple-procedure logic to ensure that where multiple abdominal transplants are undertaken, an episode or spell will escalate from these HRGs to **GA14Z Multi-Organ or Multiple Transplants**.

HRG **GA12Z Multi-Organ or Multiple Transplants** has been d and replaced by **GA14 Multi-Organ or Multiple Transplants**. Despite these two HRGs having identical labels, **GA12Z** and **GA14Z** do not have identical activity. In the HRG4+ 2015/16 Reference Costs design, a pancreas + kidney transplant escalated to HRG **GA12Z Multi-Organ or Multiple Transplants**, with the majority of activity grouping to **GA12Z** made up of pancreas + kidney transplant activity. However, in Reference Costs 2016/17, as stated above pancreas + kidney transplant activity will group to **GA16Z Pancreas Transplant**.

Additionally, multiple-procedure logic has been applied to new combination code **T31.8+Y01.- Transplantation of abdominal wall** to ensure that where a dominant procedure of **T31.8+Y01**.- is recorded with a subsidiary procedure code identifying another abdominal transplant procedure, the episode or spell will escalate to HRG **GA14Z Multi-Organ or Multiple Transplants**. This combination code has also been added to the abdominal transplant lists to ensure that the procedure Transplantation of abdominal wall will trigger escalation to **GA14Z** where recorded as a subsidiary procedure alongside an equally or more resource intensive abdominal transplant procedure.

Remapping of codes to more appropriately reflect resource usage

In order to accommodate the latest NICE guidance in the HRG4+ design, the combination code **X45.8 + Z30.1 Donation of lobe or segment of liver** has been created and mapped to HRG root **GA04 Complex Open, Hepatobiliary or Pancreatic Procedures**.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

Cosmetic changes to labels or descriptions

The label of Subchapter GA has been changed to ensure the label is consistent with current clinical practice and with other HRG4+ subchapter labels. The subchapter label has been changed from **GA Hepatobiliary and Pancreatic System Open Procedures** in the Reference Costs 2015/16 design to **GA Hepatobiliary and Pancreatic System Open and Laparoscopic Procedures** in the Reference Costs 2016/17 design.

The term “Open” has been removed from the labels of the following HRGs: **GA03* Very Complex, Hepatobiliary or Pancreatic Procedures**; **GA04* Complex, Hepatobiliary or**

Pancreatic Procedures; **GA05* Very Major, Hepatobiliary or Pancreatic Procedures**; **GA06* Major, Hepatobiliary or Pancreatic Procedures**; and **GA07* Intermediate, Hepatobiliary or Pancreatic Procedures**, and the text “Open or Laparoscopic” has been removed from the label of HRG root **GA13 Minor, Hepatobiliary or Pancreatic Procedures**. The procedures mapped to these HRG roots are no longer typically performed as open procedures but rather, laparoscopically.

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**.

Composition and Concepts		
	RC16/17	RC15/16
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

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

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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

Grouping of revisional percutaneous procedures on the intervertebral disc (codes in the OPCS categories **V59.-**, **V61.-**, and **V63.-**) has been updated so that these group in the same way as the equivalent primary procedures (**V58.-**, **V60.-**, and **V62.-**). Also, OPCS-4 code **W92.5 Other examination of joint** has been removed as a significant procedure for Core 1 (standard) grouping. For episodes, spells or attendances where **W92.5** is the only or dominant procedure, grouping will be diagnosis-driven or to an outpatient attendance (**WF***) HRG, respectively.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
Total HRGs	**111**	**110**
Total HRG Roots	**36**	**35**
Procedure-driven HRGs	111	110
Diagnosis-driven HRGs	Yes	0
Age Splits	Yes	Yes
Complications and Comorbidities Splits	No	Yes
Intervention Splits	Yes	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

Subchapter HN does not include percutaneous spinal procedures, with the exception of OPCS-4 code **W35.5 Therapeutic percutaneous puncture of bone**; these 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+ 2015/16 Reference Costs Grouper

New HRGs have been created

A new HRG **HN87Z Very Complex Orthopaedic Procedures with Massive Endoprosthesis** has been created to capture the high-cost activity of insertion or renewal of massive endoprosthesis, with or without trauma.

Changes made to logic

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.
The grouping logic has been updated so that where there are harvest OPCS-4 codes in the activity; the Grouper will not look at any of the site and approach codes following the harvest procedure code. This means that it is no longer possible for the site of the harvest to determine the HRG.

Remapping of codes to more appropriately reflect resource usage

Orthopaedic surgical activity with a primary diagnosis of **M93.0 Slipped upper femoral epiphysis (nontraumatic)** now groups to HRGs within Subchapter **HT Orthopaedic Trauma Procedures.**

Grouping for combination codes beginning with the OPCS code **W81.7 Insertion of therapeutic spacer into joint** has been changed so that these procedures group to an intermediate complexity HRG, rather than very major.

OPCS-4 code **W92.5 Other examination of joint** has been removed as a significant procedure for Core 1 grouping. For episodes or attendances where **W92.5** is the only or main procedure, grouping will be diagnosis-driven or to an outpatient (**WF***) attendance HRG, respectively.

Also, grouping for OPCS code **A67.1 Cubital tunnel release** has been updated to ensure that this maps to an elbow procedure HRG, rather than shoulder, and takes precedence over **A65.1 Carpal tunnel release**.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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

Composition and Concepts		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to logic

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.

The grouping logic has been updated so that where there are harvest OPCS-4 codes in the activity; the Grouper will not look at any of the site and approach codes following the harvest procedure code. This means that it is no longer possible for the site of the harvest to determine the HRG.

Remapping of codes to more appropriately reflect resource usage

Orthopaedic surgical activity with a primary diagnosis of **M93.0 Slipped upper femoral epiphysis (nontraumatic)** now groups to HRGs within Subchapter **HT Orthopaedic Trauma Procedures.**

Grouping for combination codes beginning with the OPCS code **W81.7 Insertion of therapeutic spacer into joint** has been changed so that these procedures group to an intermediate complexity HRG, rather than very major.

OPCS-4 code **W92.5 Other examination of joint** has been removed as a significant procedure for Core 1 grouping. For episodes or attendances where **W92.5** is the only or main procedure, grouping will be diagnosis-driven or to an outpatient (**WF***) attendance HRG, respectively.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 Reference Costs Grouper.

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		
	RC16/17	RC15/16
Total HRGs	**38**	**12**
Total HRG Roots	**33**	**4**
Procedure-driven HRGs	4	3
Diagnosis-driven HRGs	34	9
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 & dressing, where the activity does not map to the severity category HRGs i.e. in outpatient procedure 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 overtime 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% code 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

% TBSA / Degree of burn	Start Severity Category
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.

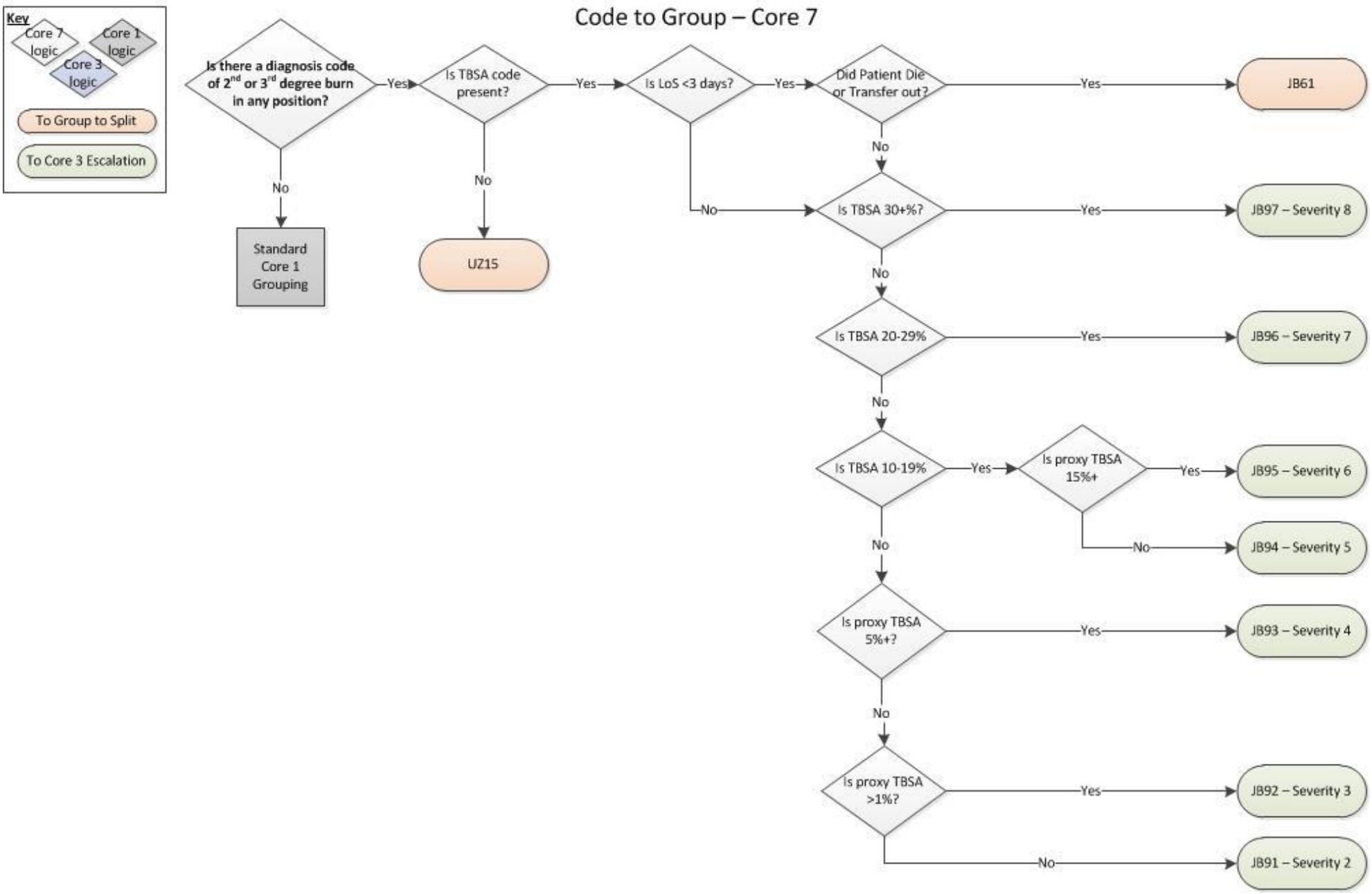
As the maximum severity category HRG is 8+ for children and 10+ for adults, patients cannot escalate beyond these HRGs.

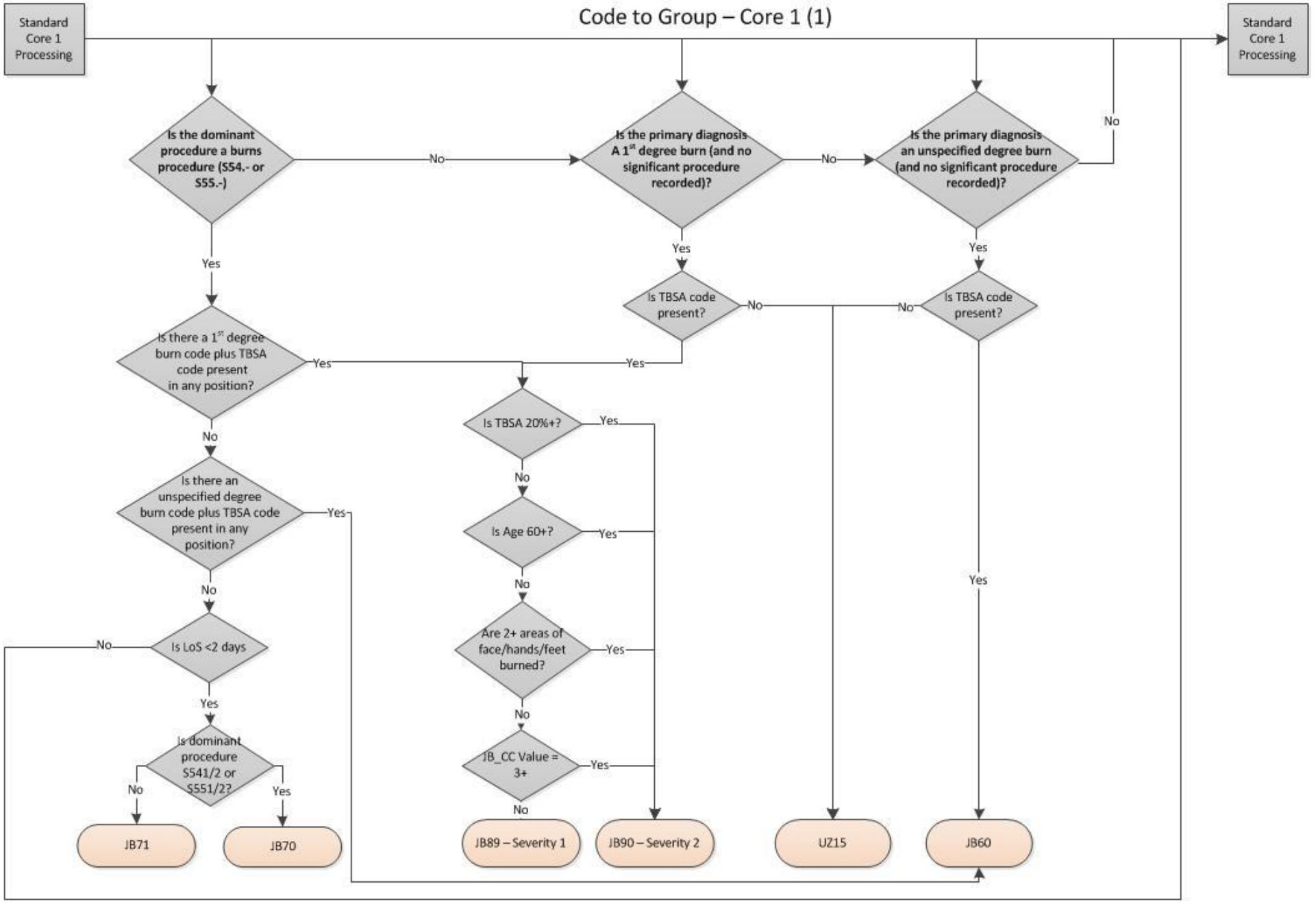
The actual HRG is then derived using patient age (adult – >15 years / child <16 years) and intervention score.

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.

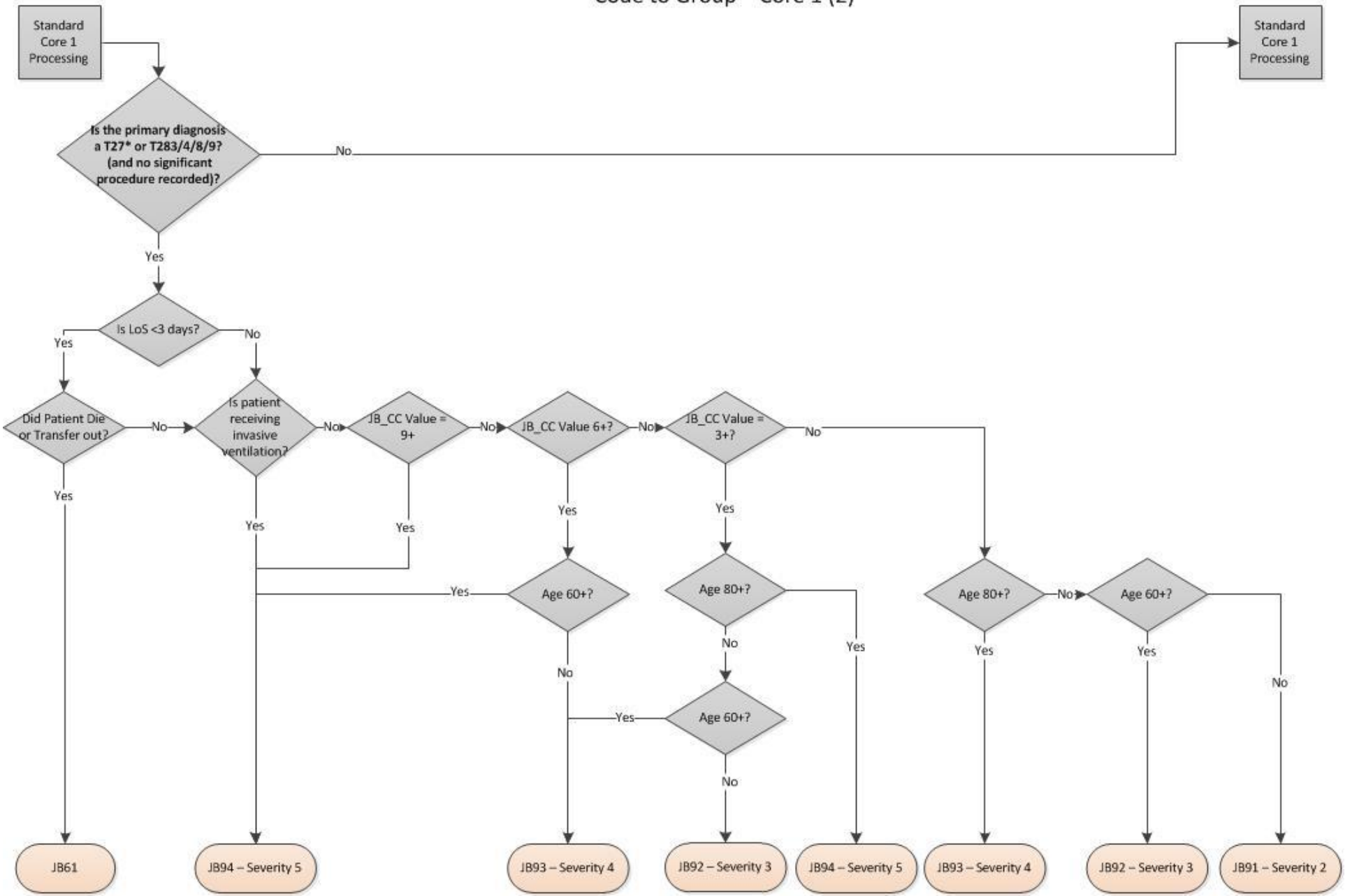
Below is a flow diagram that shows how the new burns HRGs can be generated as explained above, either using Core 7 (Burns) logic or Core 1 (standard) logic to determine whether the activity should generate a burns HRG, and if so what specific HRG or base severity category dummy HRG based on degree of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

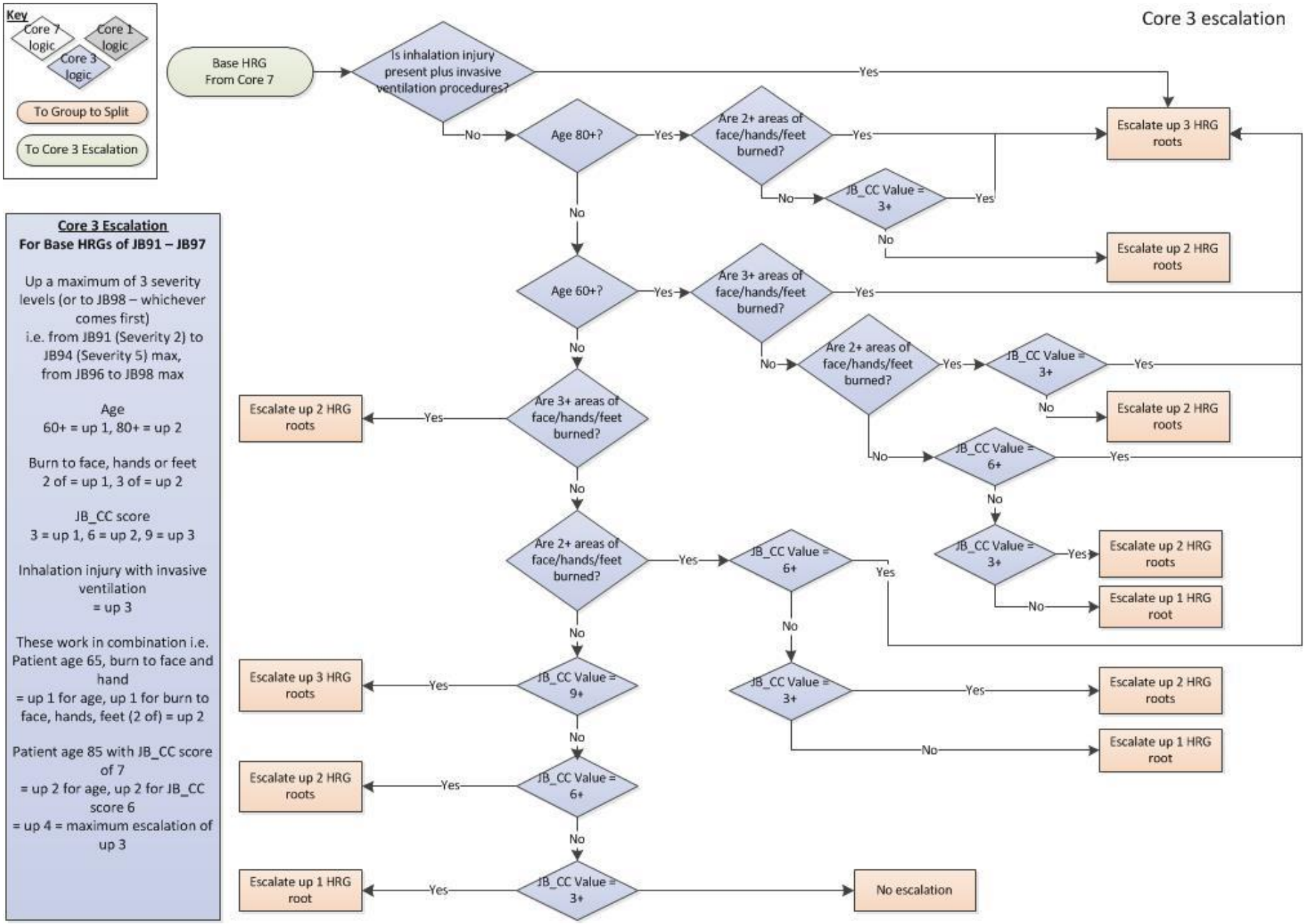
From the dummy HRG root, group to split logic as (identified in the Group to Split tab in the Excel Code to Group workbook) is used to determine the mapping of these dummy HRG roots to final HRGs based on the patient's age and intervention score.

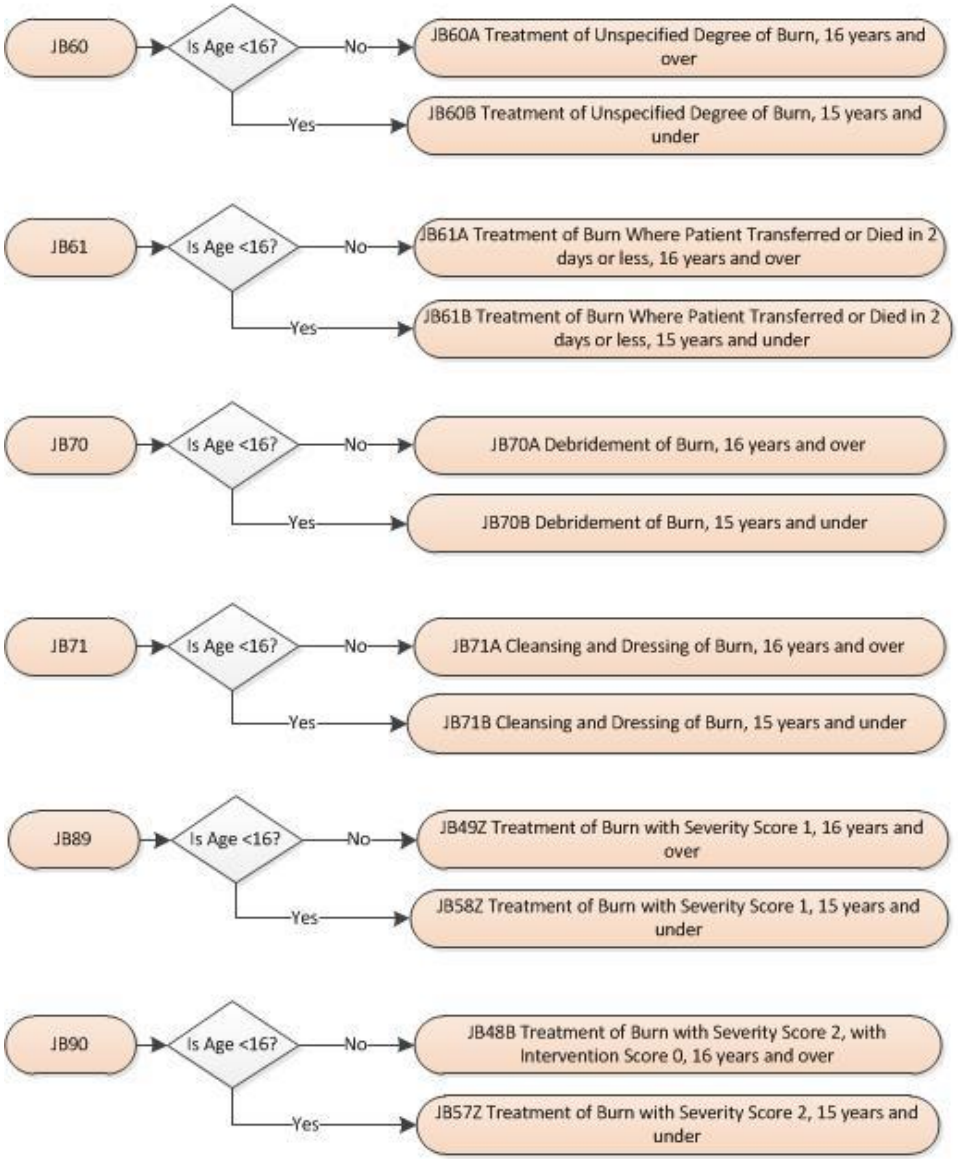


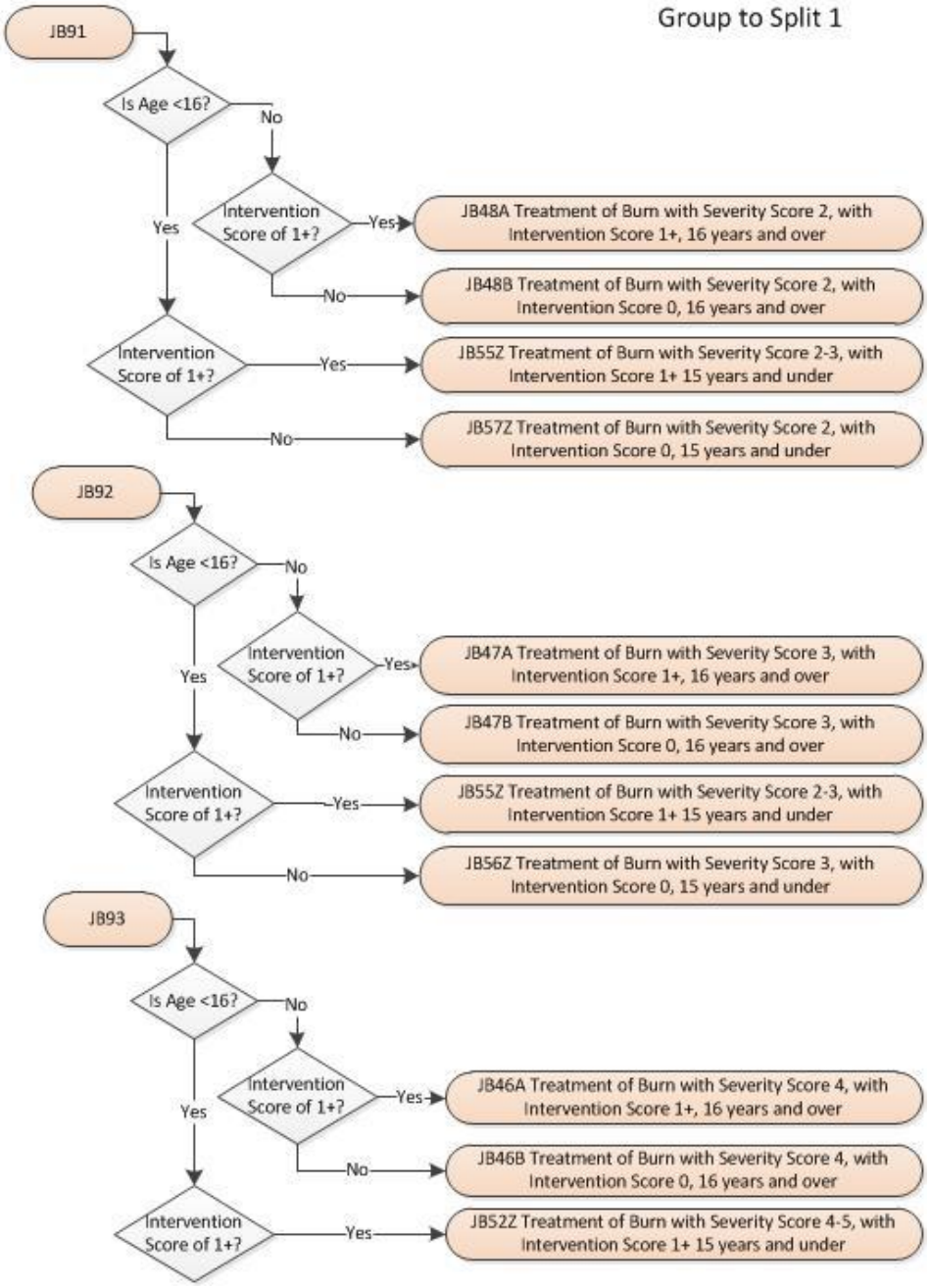


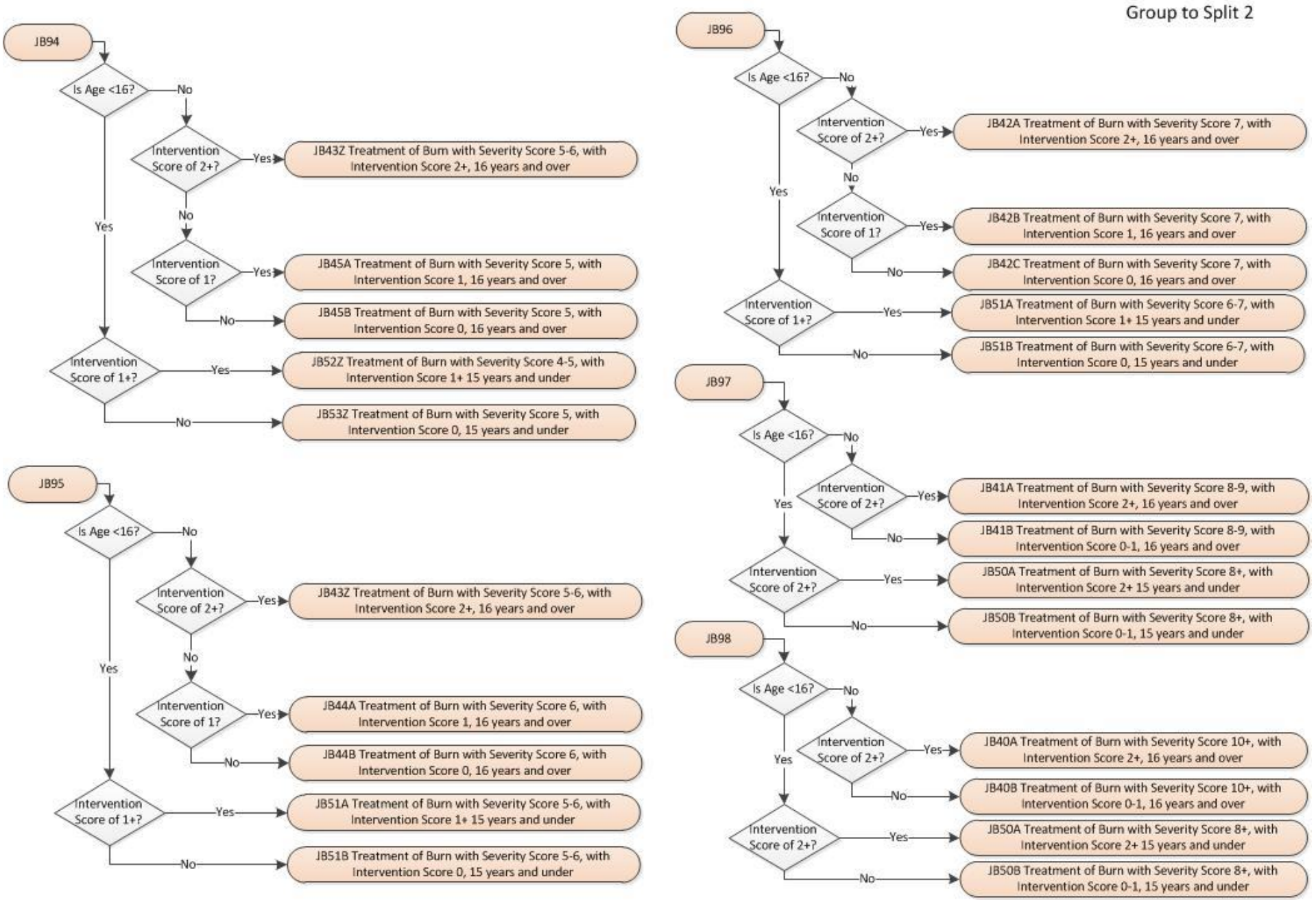
Code to Group – Core 1 (2)




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+ 2015/16 Reference Costs Grouper

The Subchapter has been redesigned

Subchapter JB has been redesigned to more closely align the HRGs to current clinical practice. The new design differentiates on the severity of burn (up to 10 levels) using the degree of burn (for 1st, 2nd and 3rd degree burns) and total body surface area (TBSA) involved, in addition to other associated complicating factors such as patient's age (elderly patients), site of burn, complications and comorbidities and inhalation injury. The HRGs are further differentiate between adults (16 years and over) and paediatric patients and interventions e.g. skin grafts, score.

There are also specific HRGs for the treatment of unspecified degree of burn, treatment of burn where the patient is transferred or dies within 2 days or less, and debridement and cleansing and dressing of burns.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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 major 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).

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		
	RC16/17	RC15/16
Total HRGs	**12**	**12**
Total HRG Roots	**8**	**8**
Procedure-driven HRGs	12	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+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 Reference Costs Grouper.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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 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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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 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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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 it would not be expected for this HRG to be generated often.

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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
Total HRGs	**149**	**149**
Total HRG Roots	**62**	**62**
Procedure-driven HRGs	93	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+ 2015/16 Reference Costs Grouper

Changes made to logic

Logic has been amended to ensure that where the primary diagnosis relates to complication or adjustment of neurostimulator but a secondary diagnosis indicates that the device has been inserted for urinary incontinence (including stress incontinence), this groups to the appropriate HRG in this subchapter, rather than defaulting to the **AA60* Insertion of Neurostimulator for Treatment of Neurological Conditions** HRGs.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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 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 Dataset.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 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.

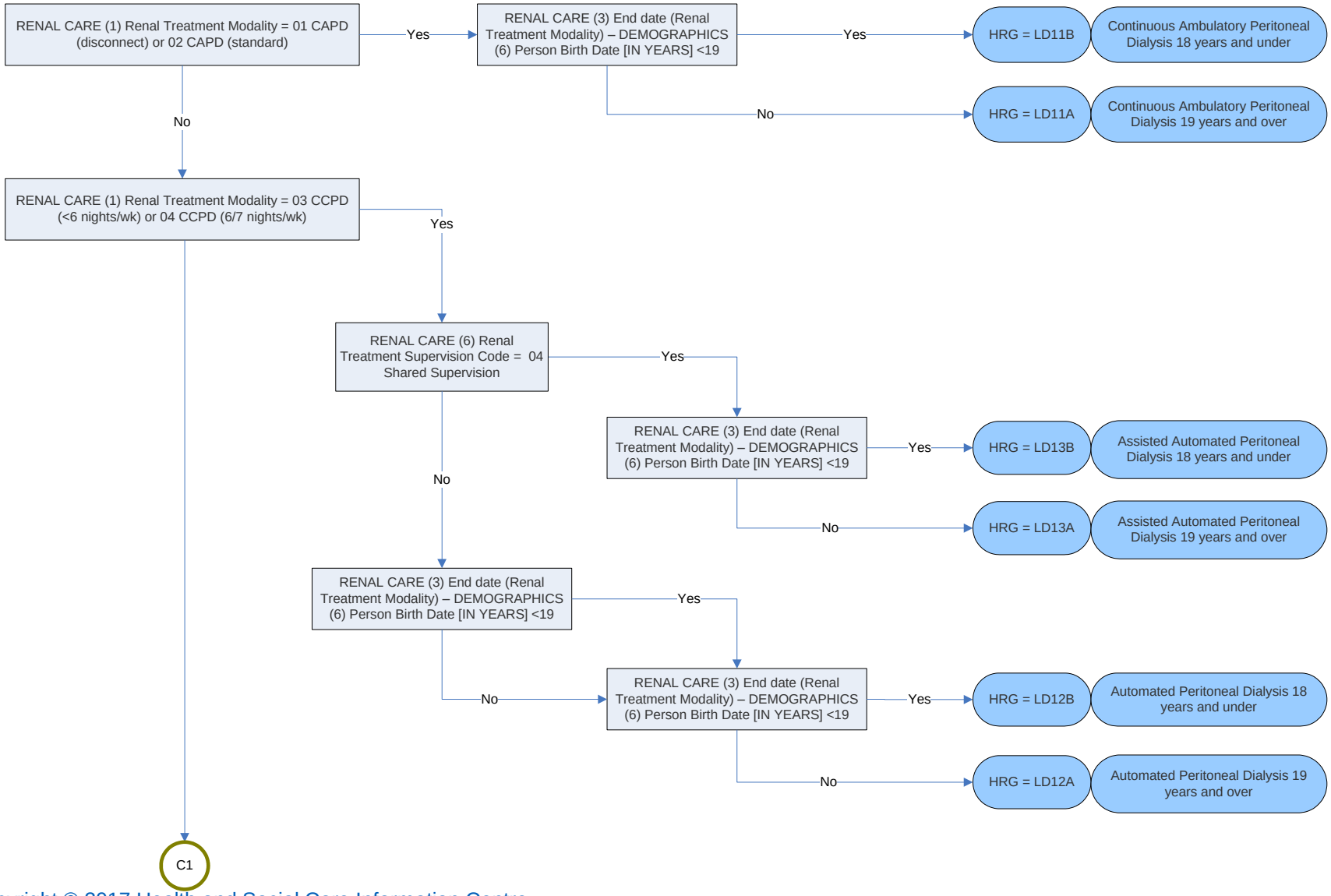
Case	Age	Renal Treatment Modality	Renal Treatment Supervision Code	Blood Tests	Type of Dialysis Access	HRG4+
A	62	05 Haemodialysis	02 Hospital	Blood test HBV surface antigen = NEG Blood test HCV antibody = NEG Blood test HIV = NEG	01 Non-tunnelled catheter	LD01A Hospital Haemodialysis or Filtration, 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

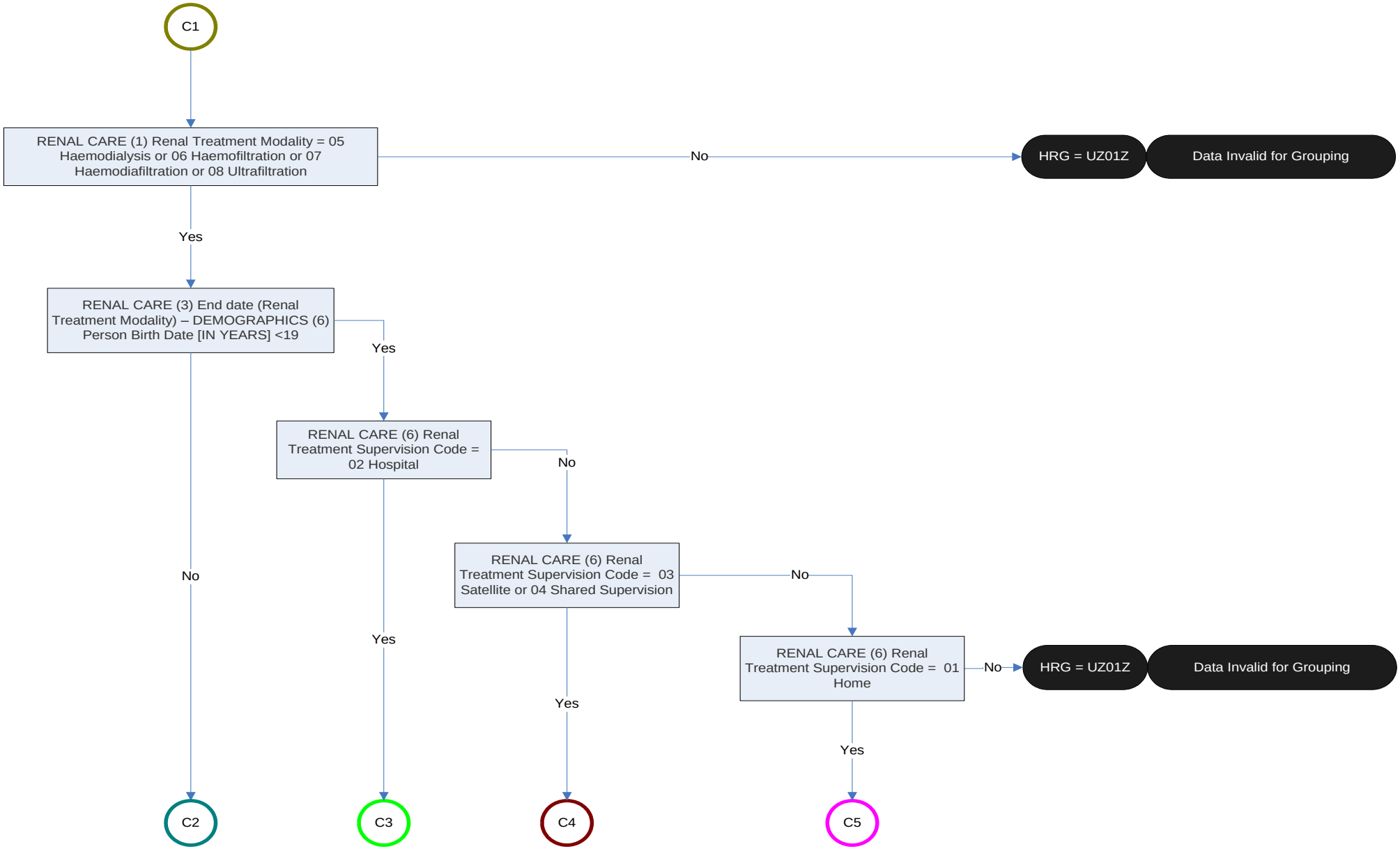
Case	Age	Renal Treatment Modality	Renal Treatment Supervision Code	Blood Tests	Type of Dialysis Access	HRG4+
D	25	05 Haemodialysis	02 Hospital	Blood test HBV surface antigen = NEG Blood test HCV antibody = **POS** Blood test HIV = NEG	03 Arteriovenous fistula	LD04A Hospital Haemodialysis or Filtration, 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

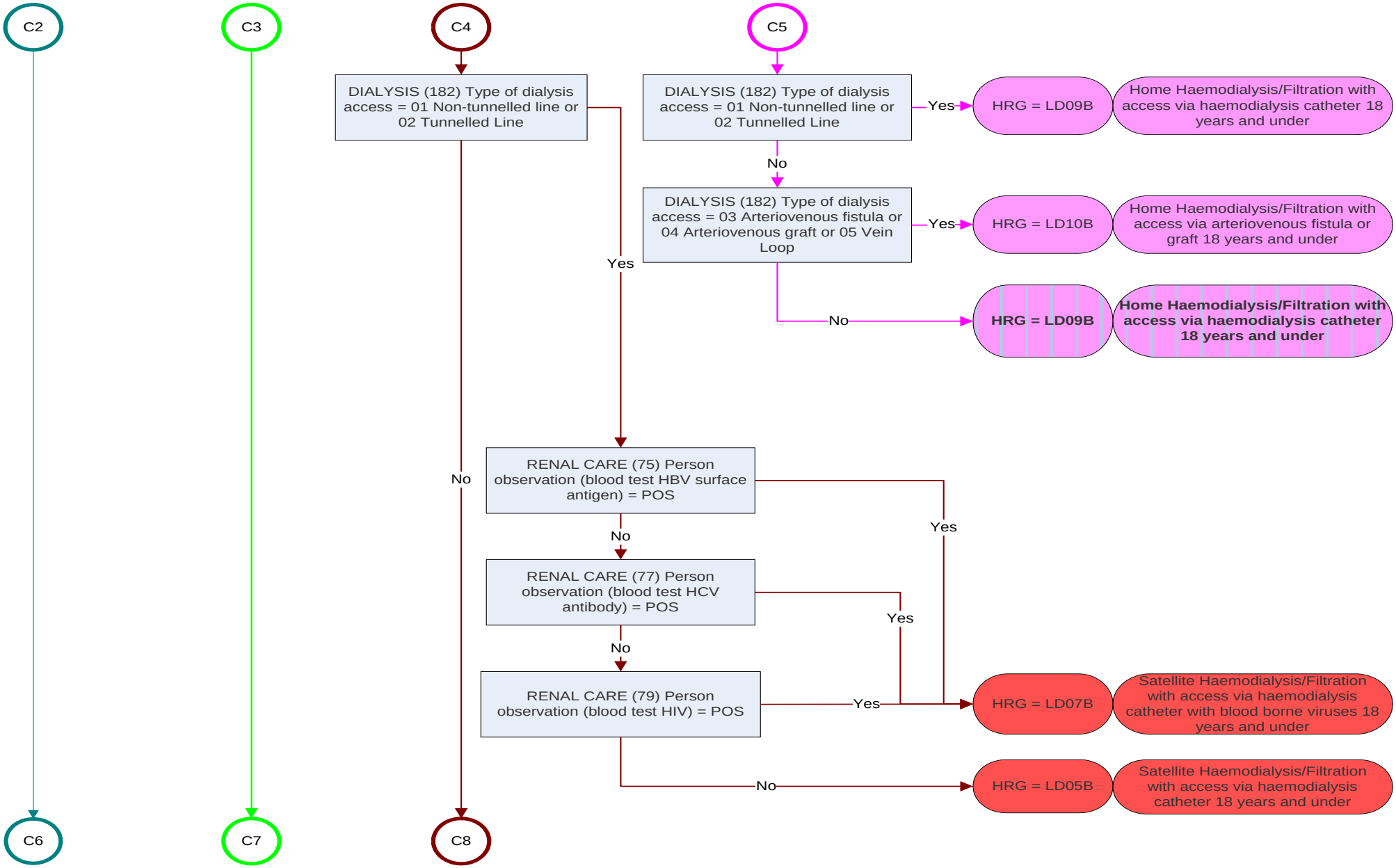
Cases F to **H** illustrate how HRG assignment is derived using the data from the NRD for peritoneal dialysis patients of differing ages, with or without the presence of blood-borne viruses, at different sites and using different access types.

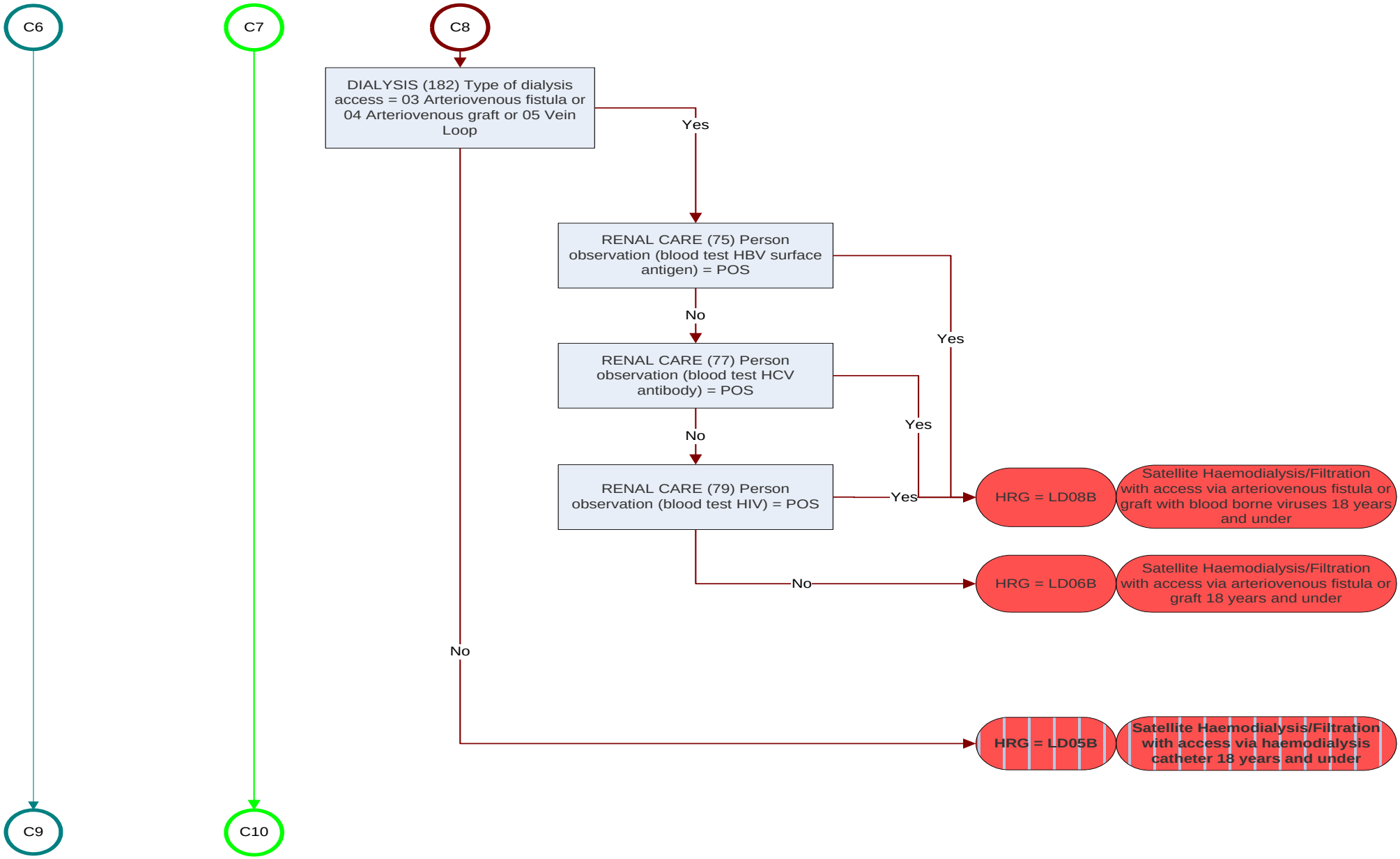
Case	Age	Renal Treatment Modality	Renal Treatment Supervision Code	Blood Tests	Type of Dialysis Access	HRG4+
F	62	02 CAPD (standard)	01 Home	Blood test HBV surface antigen = NEG Blood test HCV antibody = NEG Blood test HIV = NEG	06 PD catheter	LD11A Continuous Ambulatory Peritoneal Dialysis, 19 years 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

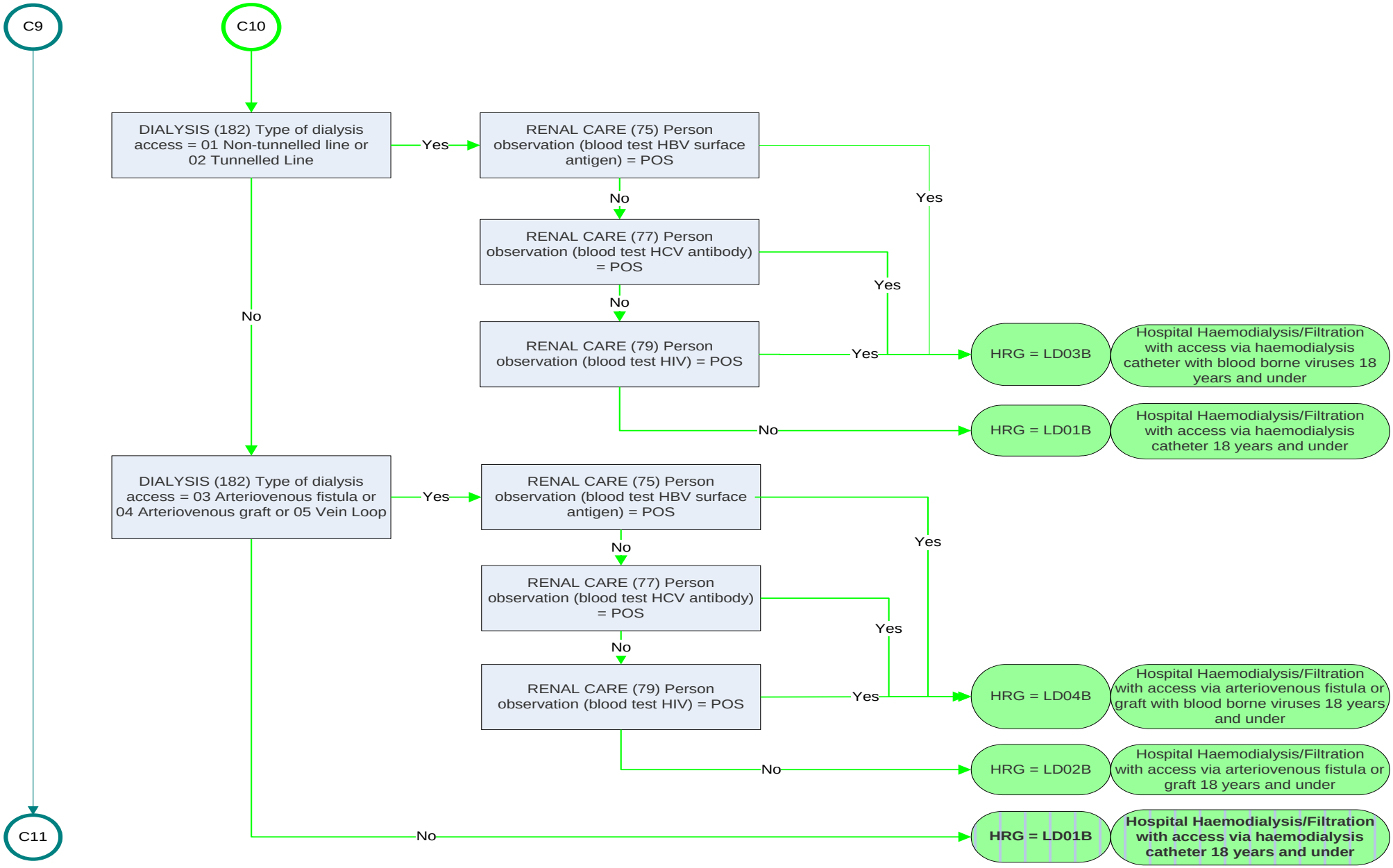
Subchapter LD: Annex A

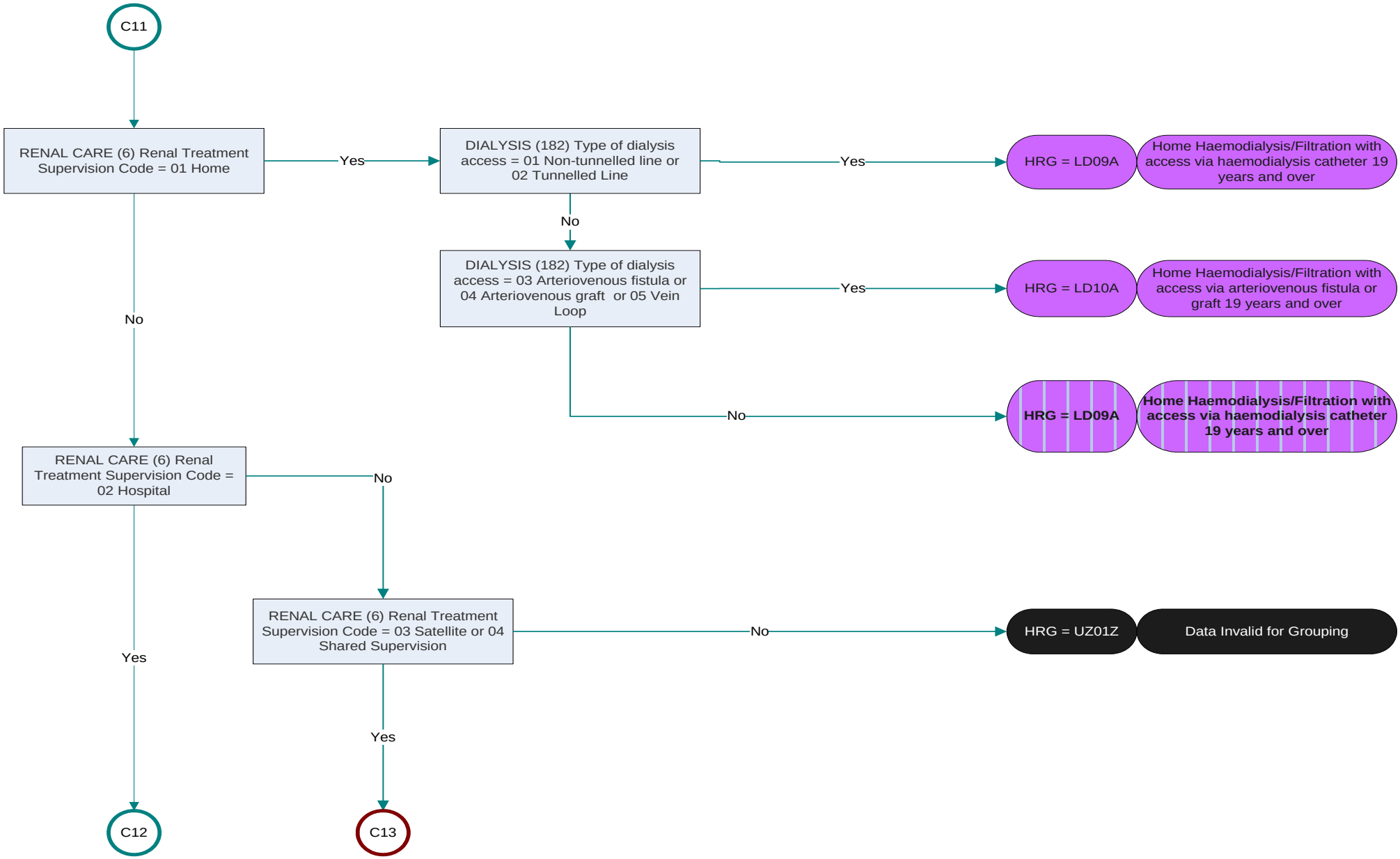


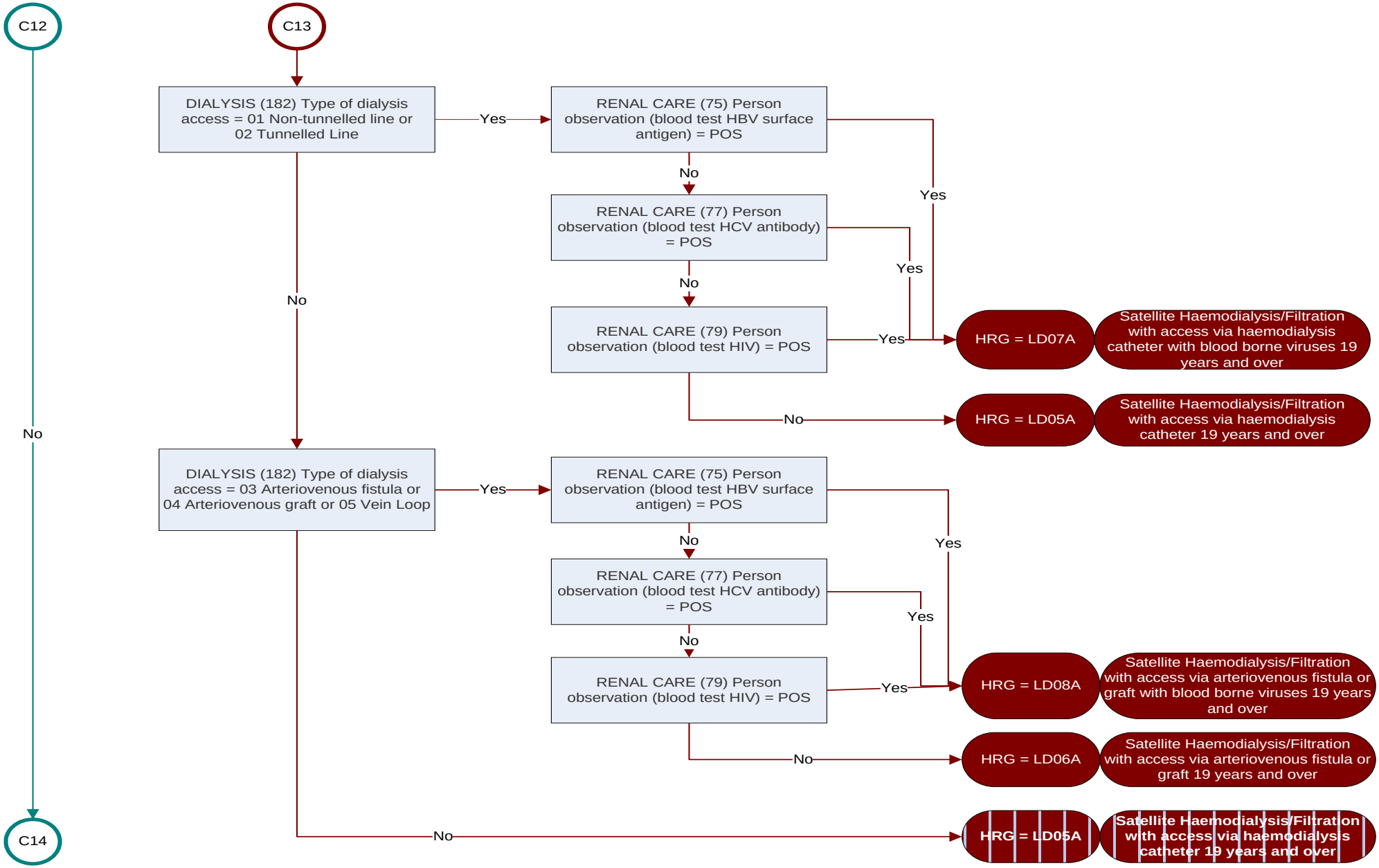


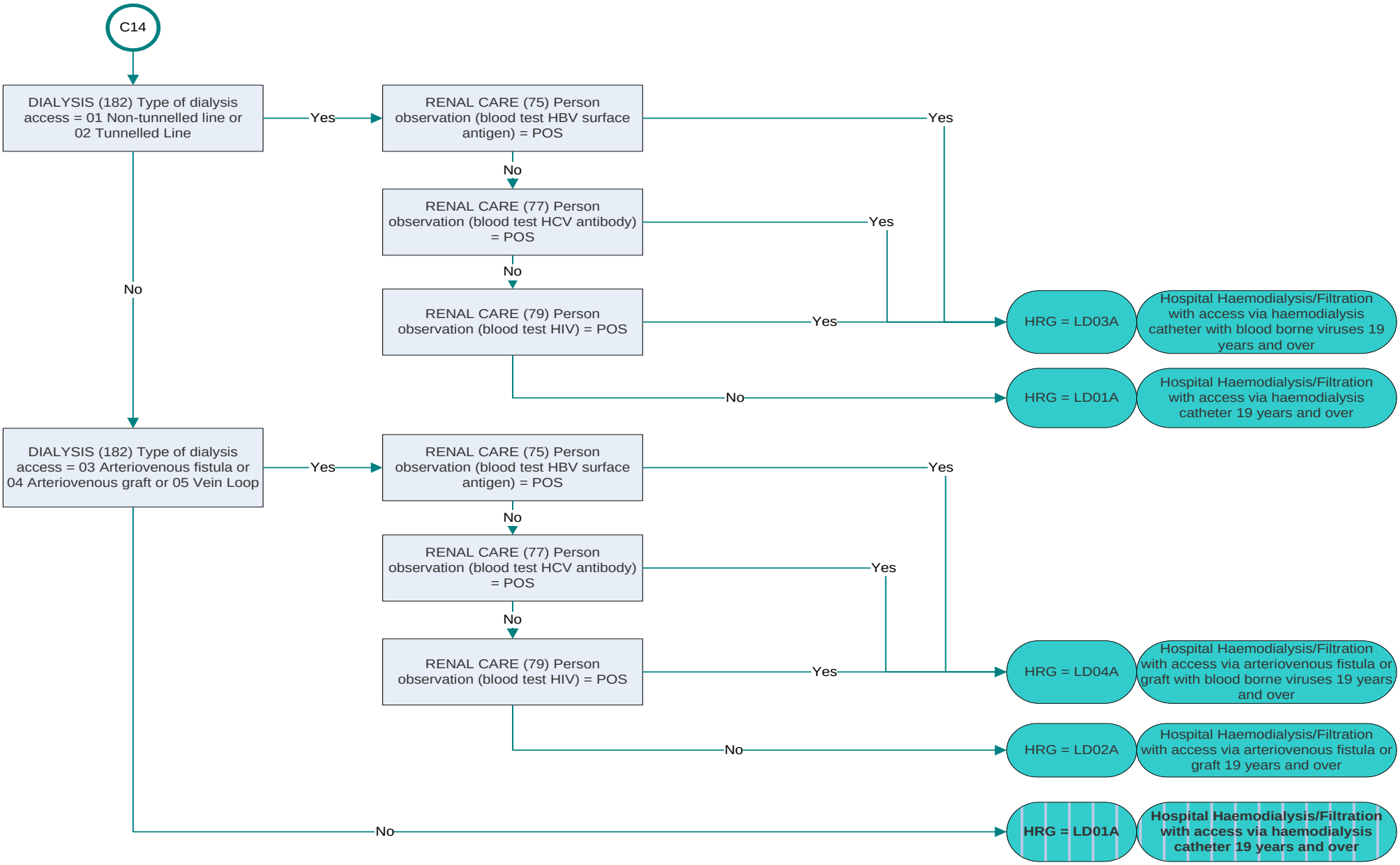












Subchapter LD:
Annex B
List of required NRD fields, acceptable values and validation applicable for the generation of LD Renal Dialysis HRGs

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 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.

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**.

Composition and Concepts		
	RC16/17	RC15/16
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 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+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 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		
	RC16/17	RC15/16
Total HRGs	48*	48*
Total HRG Roots	34	34
Procedure-driven HRGs	46	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+ 2015/16 Reference Costs Grouper

Remapping of codes to more appropriately reflect resource usage

Combination codes have been created for various procedures that are indicative of the treatment of female genital mutilation, and mapped to the appropriate resource HRG within this subchapter.

The gynaecological examination codes **Q558 Other specified other examination of female genital tract** and **Q559 Unspecified other examination of female genital tract** have been remapped to be ignored for grouping, as these codes do not indicate any more expected resource usage than occurs at a standard gynaecology outpatient attendance.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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.

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.

Composition and Concepts		
	RC16/17	RC15/16
Total HRGs	**11**	**10**
Total HRG Roots	**11**	**10**
Procedure-driven HRGs	11	10
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

Differences from the HRG4+ 2015/16 Reference Costs Grouper

New HRGs have been created to replace existing HRGs

New HRGs have been created to differentiate between surgical extraction of sperm i.e. testicular sperm extraction (TESA) and percutaneous epididymal sperm aspiration (PESA), and non-surgical collection of sperm as there is a significant resource difference between these techniques: **MC20Z Surgical Extraction of Sperm** and **MC21Z Collection of Sperm**. These replace the single **MC06Z Collection of Sperm** in the HRG4+ 2015/16 Reference Costs collection.

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.

Composition and Concepts		
	RC16/17	RC15/16
Total HRGs	55	56
Total HRG Roots	25	26
Procedure-driven HRGs	43	44
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 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.

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 service provision of obstetric medicine.

Differences from the HRG4+ 2015/16 Reference Costs Grouper

HRGs have been deleted

NZ73Z Fetal Ultrasound or Other Related Fetal Interventions has been deleted and obstetric ultrasound procedures have been remapped to either **NZ21Z Ante-Natal Standard**

Routine Ultrasound Scan and **NZ22Z Ante-Natal Specialised Non-Routine Ultrasound Scan** depending on the nature of the scan. The labels of these HRGs have also been amended to more accurately reflect the content.
OPCS code **U20.6 Fetal echocardiography** has been remapped to **EC21Z Complex Echocardiogram for Congenital Heart Disease** to better reflect the clinical nature of the activity undertaken.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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 of Neonatal disorders, differentiated by source of 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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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 one HRG, 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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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 one HRG, 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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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.

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.

Composition and Concepts		
	RC16/17	RC15/16
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

Logic is applied to determine which activity should map to the **PM45* Febrile Neutropenia** HRG 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 **PM45* Febrile Neutropenia** are not double counted, and to calculate an associated CC score, this HRG has its own specific CC list, PM45_CC, which is used in conjunction with the list PM45_Canc_Inf_Neut to capture any additional codes recorded that could have been used in mapping the activity to the HRG but were not required to calculate an appropriate CC score.

Differences from the HRG4+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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 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 Ophthalmic Disorders.

Composition and Concepts		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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 one 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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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 if 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		
	RC16/17	RC15/16
Total HRGs	47*	46
Total HRG Roots	37	36
Procedure-driven HRGs	47	46
Diagnosis-driven HRGs	1	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	Yes	Yes
Length of Stay-qualified	Yes	No

*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).

Differences from the HRG4+ 2015/16 Reference Costs Grouper

New HRGs have been created

A new “empty core” HRG – **RD97Z Admission or Attendance for Diagnostic Imaging** has been created for where patients are specifically admitted or attend for diagnostic imaging i.e. where the Treatment Function Code is 812 Diagnostic Imaging and an unbundled diagnostic imaging procedure code is recorded. This reflects the fact that all the resources for these patients are related to the unbundled, rather than core, HRG.

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		
	RC16/17	RC15/16
Total HRGs	**69***	**68**
Total HRG Roots	**38**	**37**
Procedure-driven HRGs	69	68
Diagnosis-driven HRGs	1	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	Yes	Yes
Length of Stay-qualified	Yes	No

*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.

Differences from the HRG4+ 2015/16 Reference Costs Grouper

New HRGs have been created

A new “empty core” HRG – **RN97Z Admission or Attendance for Nuclear Medicine** has been created for where patients are specifically admitted or attend for diagnostic imaging i.e. where the Treatment Function Code is 812 Diagnostic Imaging and an unbundled nuclear medicine procedure code is recorded. This reflects the fact that all the resources for these patients are related to the unbundled, rather than core, HRG.

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		
	RC16/17	RC15/16
Total HRGs	**104**	**99**
Total HRG Roots	**41**	**37**
Procedure-driven HRGs	33	27
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 new 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 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+ 2015/16 Reference Costs Grouper

New HRGs have been created to replace existing HRGs

The HRGs for **SA13A/B Single Plasma Exchange, Leucophoresis or Red Cell Exchange** has been deleted and replaced by seven new procedure-specific HRGs: **SA41Z Automated Red Cell Exchange**; **SA42Z Manual Red Cell Exchange**; **SA43Z Leucopheresis**; **SA44A/B Single Plasma Exchange or Other Intravenous Blood Transfusion**; and

SA45A/B Injection of Rh Immune Globulin or Other Blood Transfusion. This change ensures that red cell exchange and other resource intensive procedures are not mapped to the same HRG as procedures that consume a comparatively lower level of expected resource.

Remapping of codes to more appropriately reflect resource usage

The combination code **X32.6 + Y73.2 Red cell exchange with extracorporeal circulation NEC** has been created to identify automated red cell exchange in patients with sickle cell disease. The new combination code has been mapped to its own HRG, **SA41Z Automated Red Cell Exchange**. Automated red cell exchange is more expensive per transfusion than manual red cell exchange as it uses more blood; however, per NICE guidance, automated red cell exchange is less expensive overall than manual red cell exchange in patients with sickle cell disease who need regular transfusion, and is better for patients because patients undergoing automated red cell exchange require fewer transfusions per year and iron overload is avoided.
Manual red cell exchange is coded using **X32.6 Red cell exchange**, and this too is now mapped to its own HRG, **SA42Z Manual Red Cell Exchange**.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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 delivery or procurement of chemotherapy procedure code, a length of stay of 0 days, 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+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 Reference Costs Grouper.

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 (1st 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 (1st 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 1st attendance of cycle 1, the grouper will output a procurement HRG and a delivery HRG. For the 1st attendance of cycle two, the grouper will again output both a procurement HRG and a delivery HRG.

1st 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

1st 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 (1st 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 (1st 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		
	RC16/17	RC15/16
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 procedure code for the delivery of external beam radiotherapy or nuclear medicine therapy, a length of stay of 0 days and a lack of any other significant procedure code.

Differences from the HRG4+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 Reference Costs Grouper.

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	1st 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		
	RC16/17	RC15/16
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), 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.

Differences from the HRG4+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 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]
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]
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
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

HRG	Label	Definition	Notes
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 recorded in the CDS will not generate multiple instances of this HRG]

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		
	RC16/17	RC15/16
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.

UZ03 Diagnosis Conflicts with Age
This error indicates that a paediatric diagnosis 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+ 2015/16 Reference Costs Grouper

A New U Error Category has been created

A new U Error category, **UZ15**, Burns Error has been created for activity where a burns primary diagnosis code of unspecified body region or total body surface area (TBSA) is recorded, or burns diagnosis code recorded, in any position, with no subsequent TBSA code present. Where this error is found in the patient record, the HRG generated will be **UZ01Z Data invalid for grouping**,

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		
	RC16/17	RC15/16
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. 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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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 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 with labels

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)

Please 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+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 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 working out 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 working out 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 inpatient 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		
	RC16/17	RC15/16
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

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.

Differences from the HRG4+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 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 prior to discharge or transfer to a specialist mental health provider.

Given the fact that mental health services provided by specialist providers are captured using the mental health clustering classification, the HRGs within Subchapter WD effectively form the residue of treatment of mental health patients by non-specialist mental health service providers.

The HRGs are differentiated based on type of mental health disorder in line with ICD-10 diagnosis code definitions, and do not yet unitise interactive CC splits or intervention splits.

Composition and Concepts		
	RC16/17	RC15/16
Total HRGs	9	3
Total HRG Roots	9	3
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	9	3
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

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+ 2015/16 Reference Costs Grouper

The Subchapter has been redesigned

Subchapter WD has been redesigned to more closely align the HRGs to current clinical practice and the fact that not all diagnoses that mapped into HRGs within this Subchapter would be conditions expected to be treated under a Mental Health service.

Sleep disorders have been remapped to new specific HRGs in Subchapter AA Nervous System Disorders.

A new HRG – **WD02Z Alzheimers Disease or Dementia, treated by a Non-Specialist Mental Health Service Provider** has been created in this Subchapter specific to Alzheimers disease and dementia, with some codes being remapped into this HRG, from the now deleted, **AA27Z Medical Care of Patients with Alzheimer's Disease**.

New HRGs have been created in Subchapter WH for disorders relating to acute drug and alcohol intoxication, from activity that previously mapped into Subchapter WD. Certain signs and symptoms and congenital conditions involving developmental disorders e.g. Down syndrome have also been remapped into more appropriate HRGs within Subchapter WH, to reflect that these are not clinically deemed mental health disorders.

The WD Mental Health – treated by a non-specialised mental health service provider HRGs have been differentiated based on type of disorder in line with ICD-10 diagnosis code definitions, as follows:

- **WD01* Delirium**
- **WD02* Alzheimers Disease or Dementia**
- **WD03* Personality Disorders**
- **WD04* Behavioural Syndromes**
- **WD05* Neurotic, Stress-Related or Somatoform Disorders**
- **WD06* Mood Affective Disorders**
- **WD07* Schizophrenia, Schizotypal or Delusional Disorders**
- **WD08* Mental and Behavioural Disorders Due to Drug or Alcohol Use**
- **WD09* Other Mental Health Disorders**

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 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 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		
	RC16/17	RC15/16
Total HRGs	**68**	**64**
Total HRG Roots	**29**	**25**
Procedure-driven HRGs	2	2
Diagnosis-driven HRGs	66	62
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 and 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+ 2015/16 Reference Costs Grouper

New HRGs have been created

Three new HRG roots comprising four new HRGs for disorders relating to acute drug and alcohol intoxication have been created in Subchapter WH. The ICD-10 diagnosis codes mapped to these HRG roots were previously mapped to HRG roots in Subchapter WD. These are **WH21* Acute Alcohol Intoxication**, **WH22Z Acute Drug Intoxication** and **WH23Z Acute Combined Drug Intoxication**.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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, septic shock, 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		
	RC16/17	RC15/16
Total HRGs	40	40
Total HRG Roots	9	9
Procedure-driven HRGs	0	0
Diagnosis-driven HRGs	40	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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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**, and there are three HRGs specific to neonatal special care baby unit (SCBU) or 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		
	RC16/17	RC15/16
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.

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 and 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+ 2015/16 Reference Costs Grouper

Changes made to incorporate new Critical Care Activity Codes

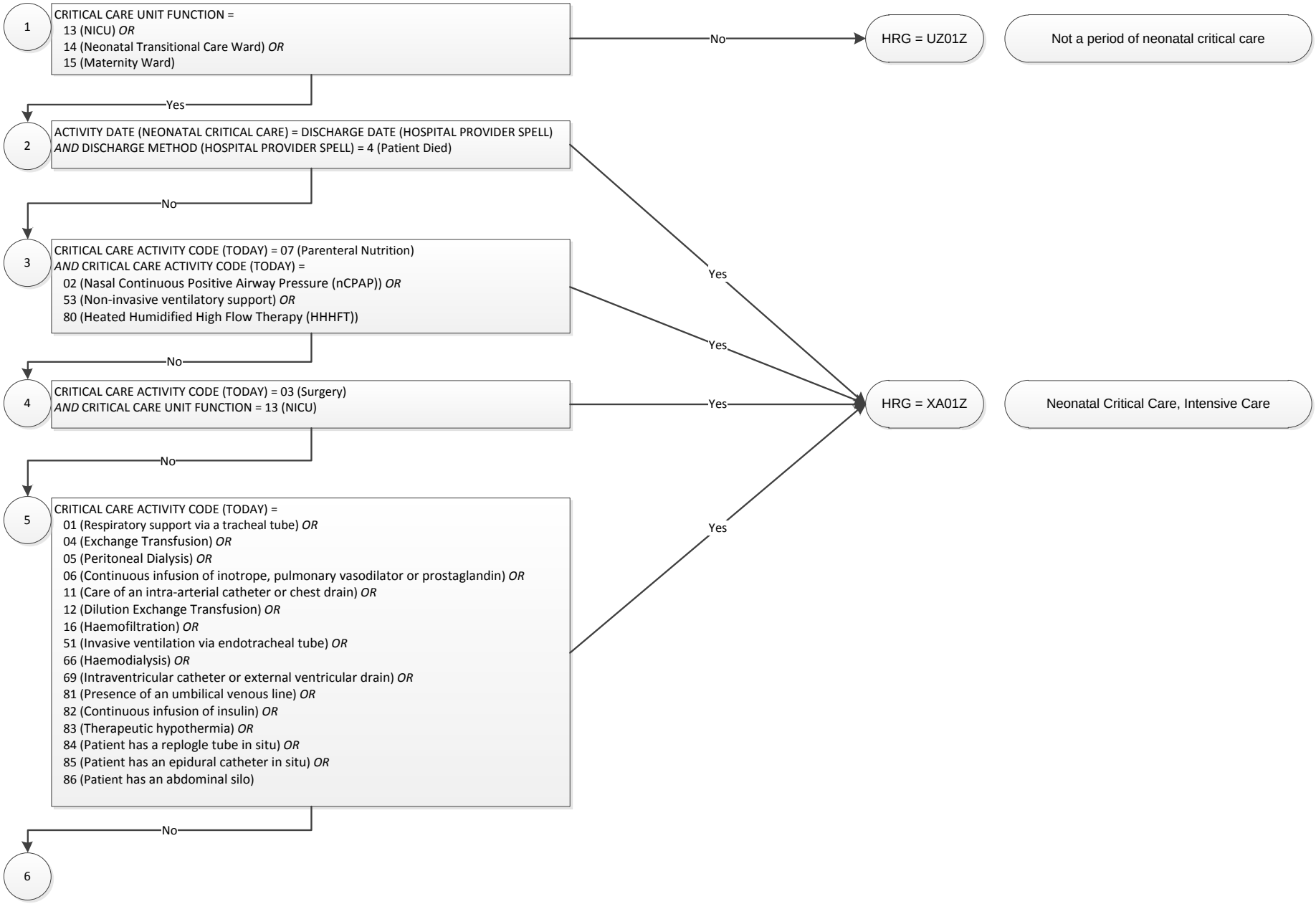
Changes have been made to the grouping design to accommodate the 14 new Critical Care Activity Codes (CCACs) introduced in Version 2.0 (2016) of the Neonatal Critical Care Minimum Data Set (see SCCI Information Standard 0075 for further information).

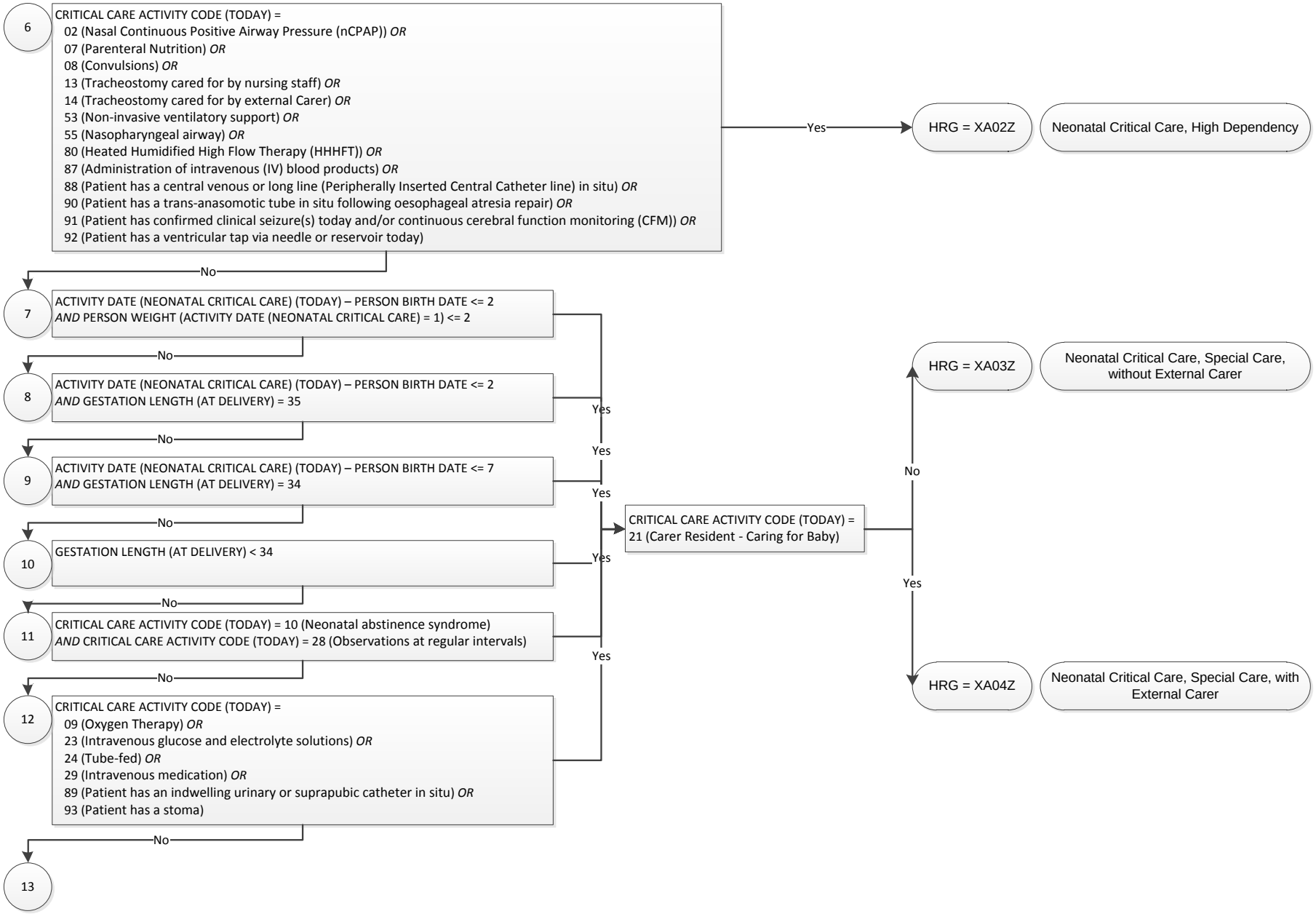
Changes made to logic

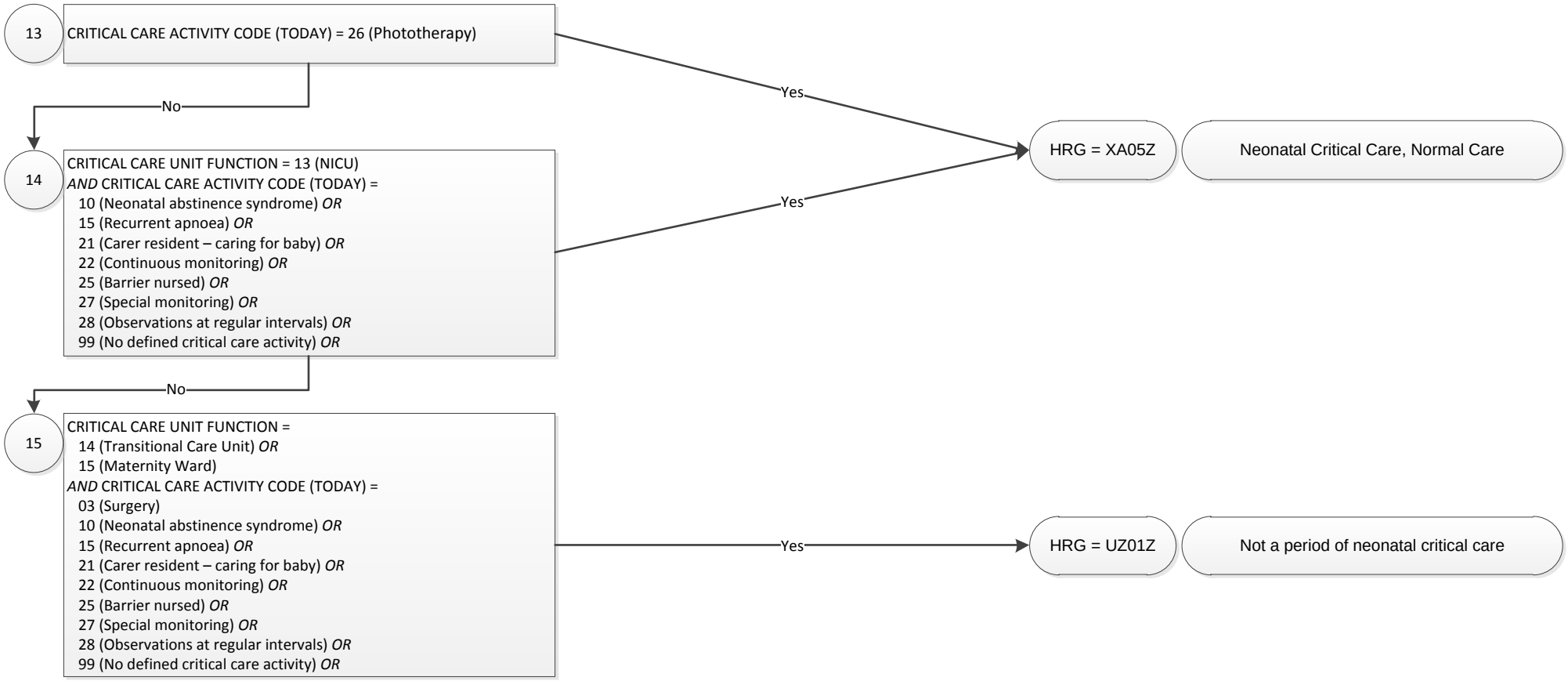
The person weight, gestation length, and person age (days) ranges used in grouping have been updated. All cases of “yesterday” logic (grouping based on whether the patient met a certain criteria on the previous day) have been removed. Use of Critical Care Unit Function as a qualifying factor in the design has been expanded to cover more CCACs.

Remapping of codes to more appropriately reflect resource usage

Changes have been made to the design to ensure that the existing CCACs group to the HRG that best reflects the associated resource use.







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		
	RC16/17	RC15/16
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 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+ 2015/16 Reference Costs Grouper

Changes made to incorporate new Critical Care Activity Codes

Changes have been made to the grouping design to accommodate the 6 new Critical Care Activity Codes (CCACs) introduced in Version 2.0 (2016) of the Paediatric Critical Care Minimum Data Set (see SCCI Information Standard 0076 for further information).

Changes made to logic

New logic has been added so that XB06Z cannot be generated for more than 90 consecutive days on which the dominant CCAC for grouping is ***52 Invasive ventilation via tracheostomy tube***.
New logic has been added so that XB06Z cannot be generated for more than 90 consecutive days on which the dominant CCAC for grouping is ***53 Non-invasive ventilatory support***.
In addition, the logic which resulted in escalation to a higher HRG on the day that a patient died has been removed.

Remapping of codes to more appropriately reflect resource usage

Changes have been made to the design to ensure that the existing CCACs group to the HRG that best reflects the associated resource use.
A number of ICD-10 codes have been added to the list of isolation codes.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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.

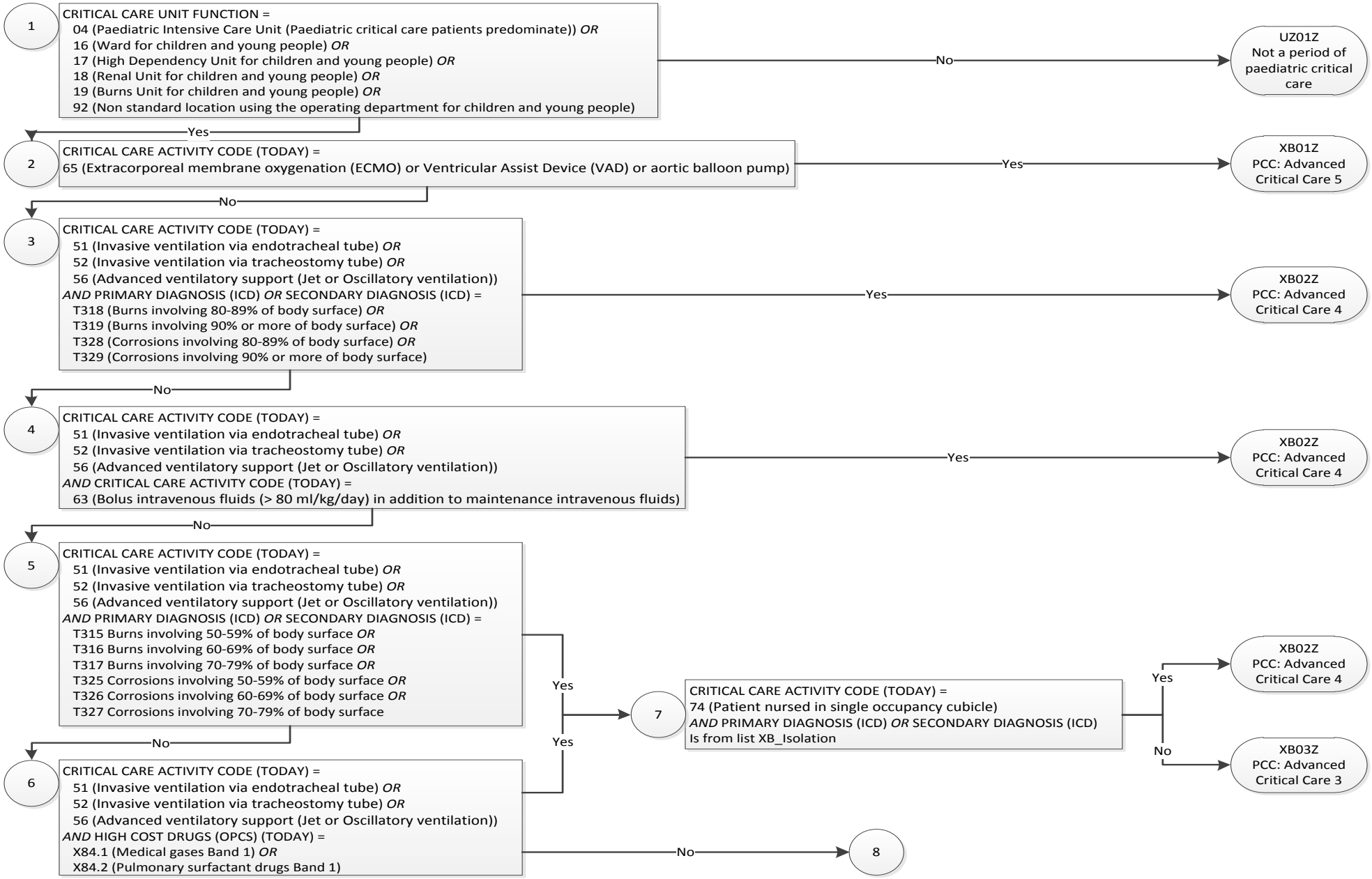
B	16 (Ward for children and young people)	10	1(Patient discharged on clinical advice or with clinical consent)	62 Central venous pressure monitoring				XB06Z	Paediatric Critical Care, Basic Critical Care

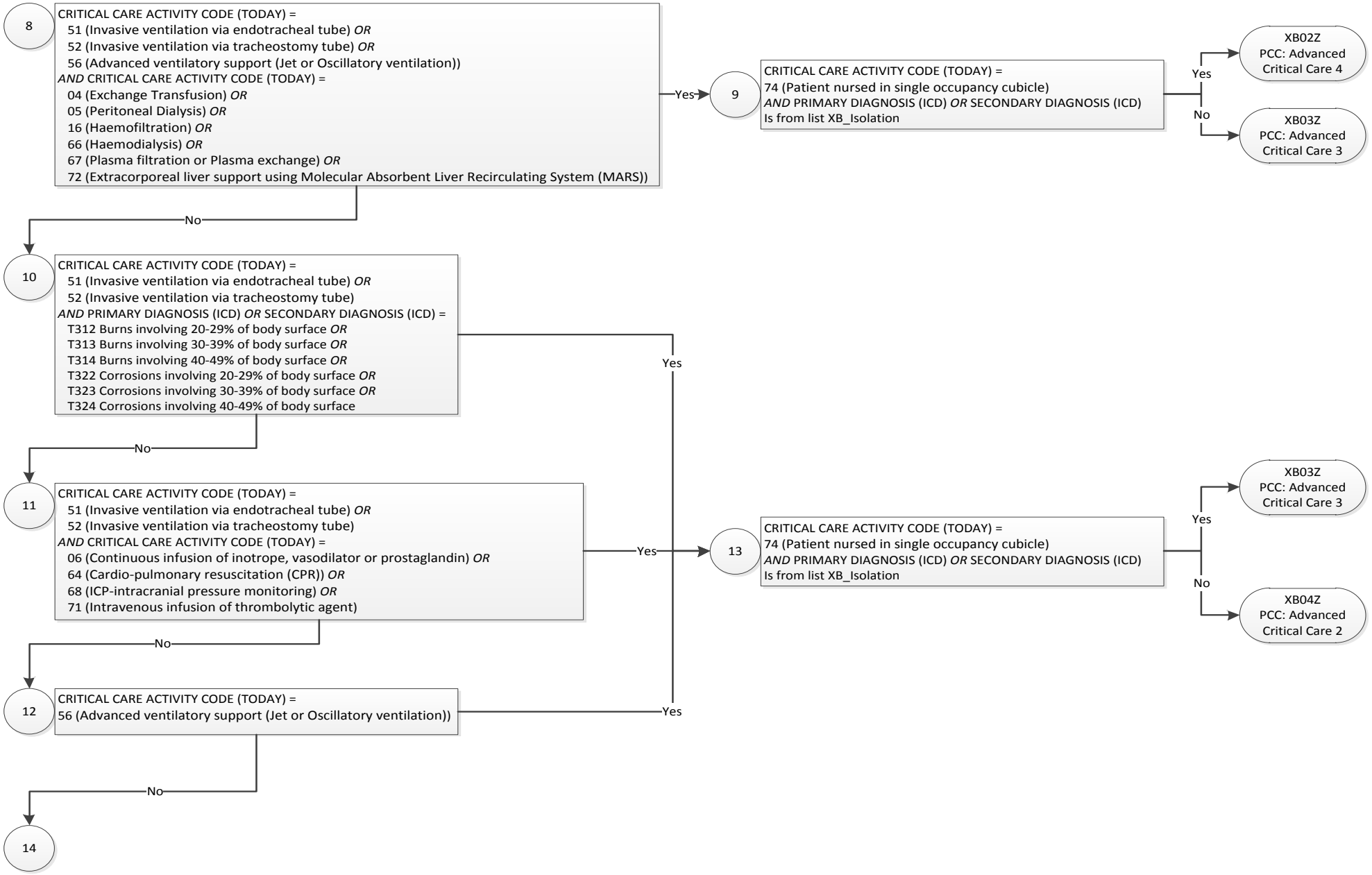
Case C: A patient is being treated in the paediatric critical care unit and has invasive ventilation after being severely burned. This illustrates how the diagnosis is used in deriving the HRG.

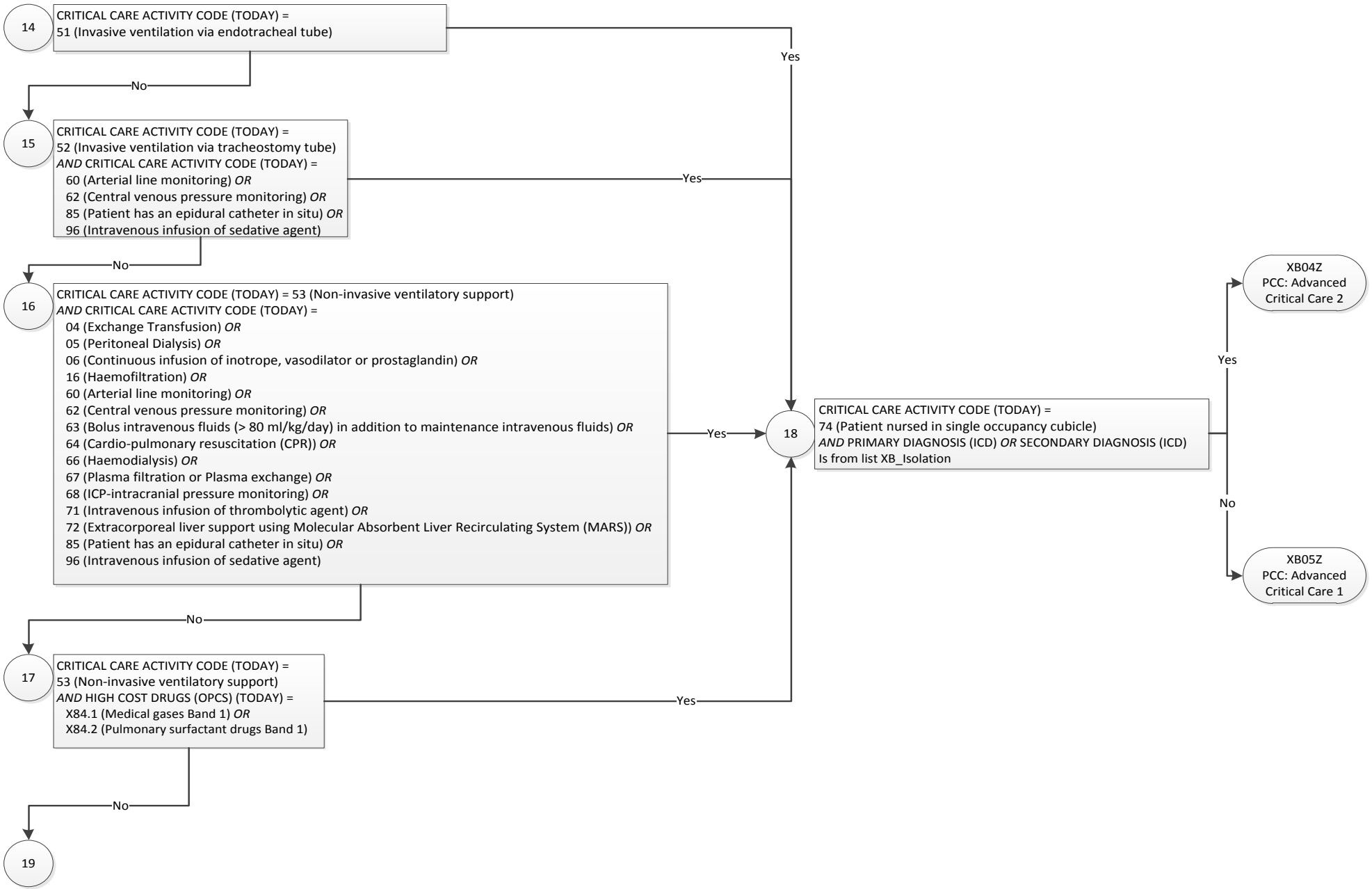
C	04 (Paediatric Intensive Care Unit)	10	1(Patient discharged on clinical advice or with clinical consent)	51 Invasive ventilation via endotrachial tube		T31.5	Burns involving 50-59% of body surface	XB03Z	Paediatric Critical Care, Advanced Critical Care 3

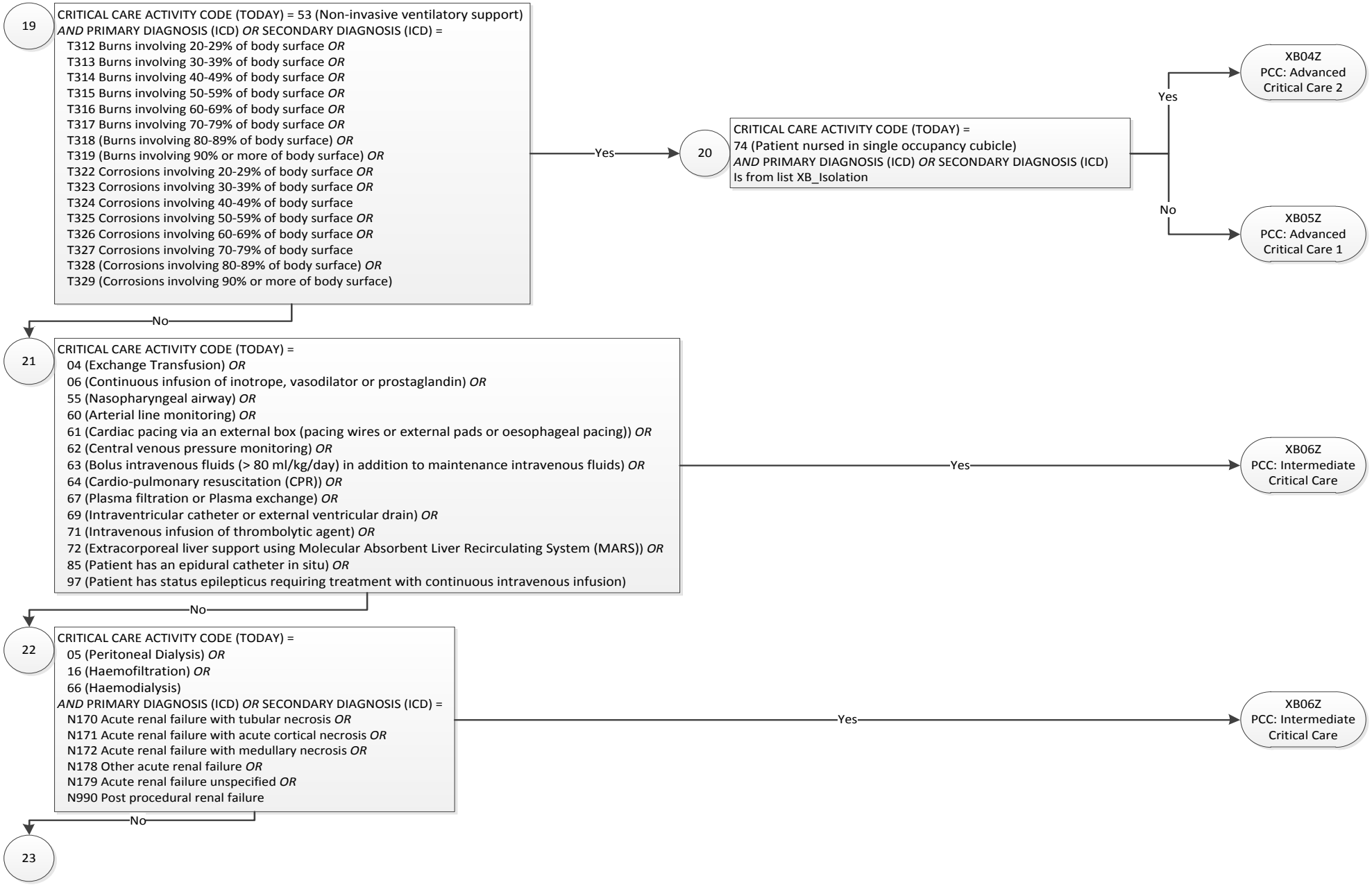
Case D: A patient with renal hypoplasia who develops adenoviral pneumonia is admitted to a single occupancy cubicle in the paediatric critical care unit. This illustrates how both the diagnosis and CCAC affect the HRG derived.

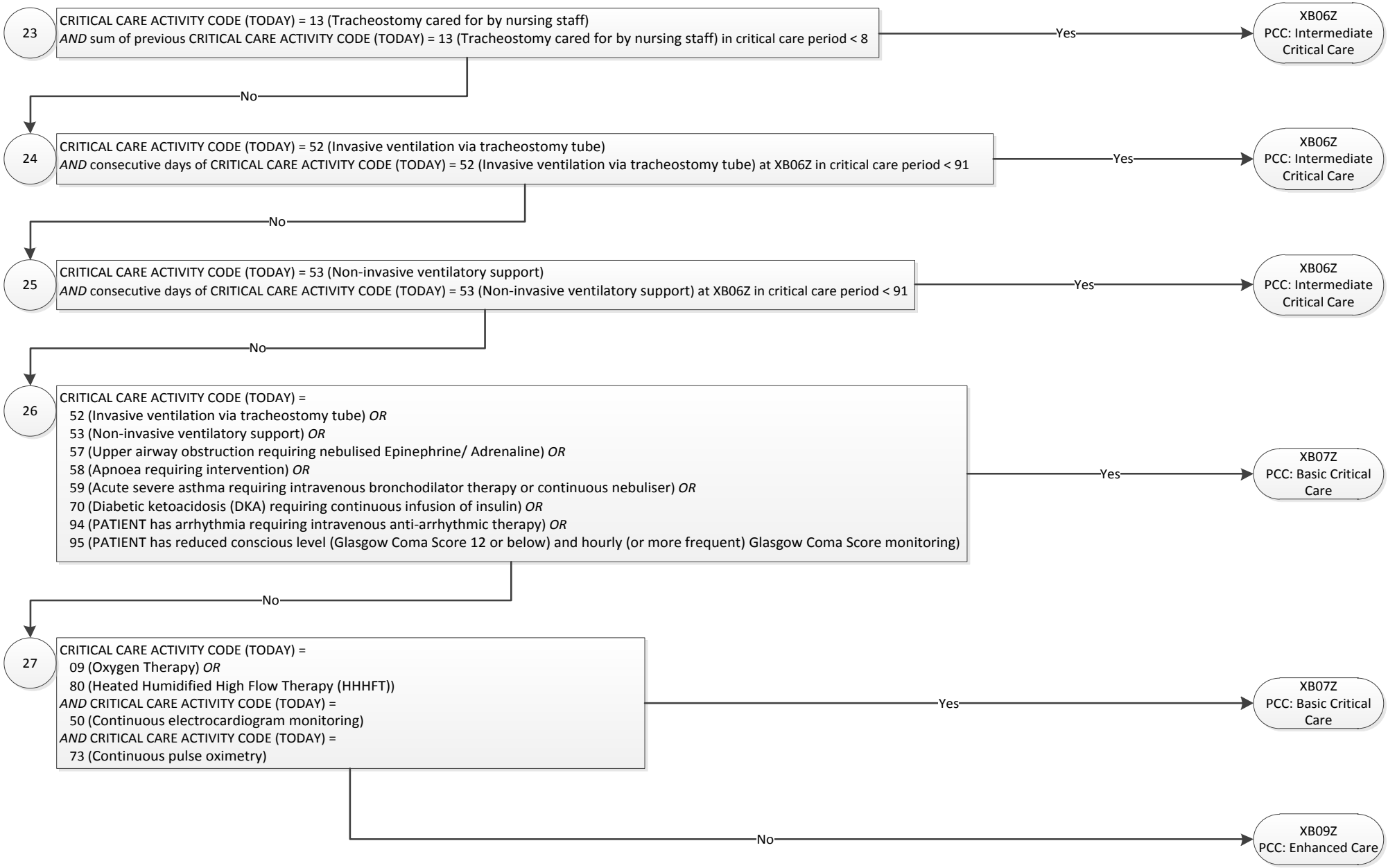
D	04 (Paediatric Intensive Care Unit)	10	1(Patient discharged on clinical advice or with clinical consent)	51 Invasive ventilation via endotrachial tube	05 Peritoneal dialysis + + 74 Patient nursed on single occupancy cubicle	Q60.5 +_ J12.0	Renal hypoplasia, unspecified + Adenovial pneumonia	XB02Z	Paediatric 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		
	RC16/17	RC15/16
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 numbers 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 numbers of days of 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+ 2015/16 Reference Costs Grouper

No changes

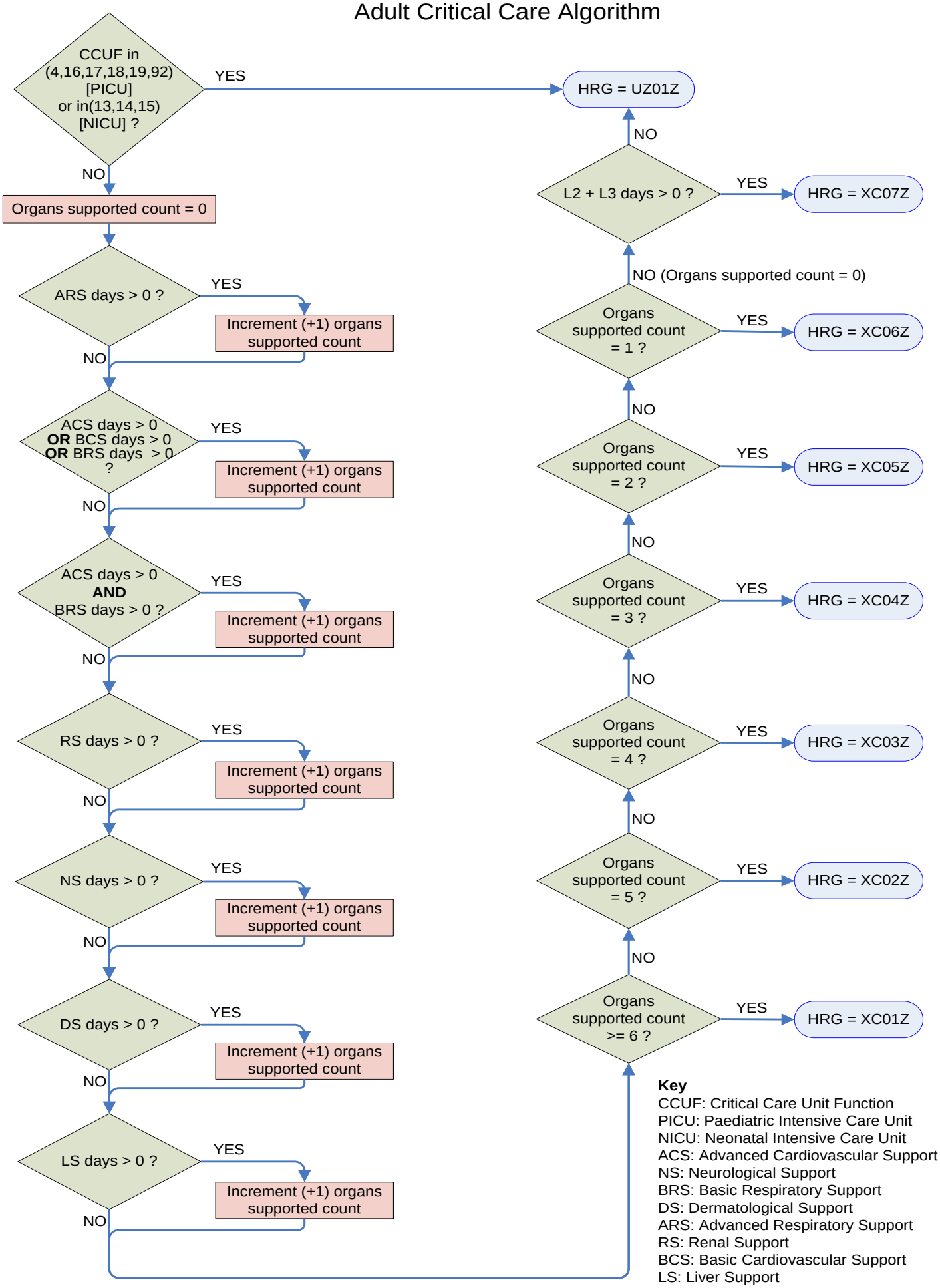
No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 Reference Costs Grouper

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 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.

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.

Composition and Concepts		
	RC16/17	RC15/16
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

Differences from the HRG4+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 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		
	RC16/17	RC15/16
Total HRGs	**11**	**10**
Total HRG Roots	**8**	**7**
Procedure-driven HRGs	11	10
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+ 2015/16 Reference Costs Grouper

New HRGs have been created

As per NICE guidance, a new HRG – **YA13Z Percutaneous Transluminal, Embolectomy or Thrombolysis, of Intracranial or Extracranial Blood Vessel**, has been created for mechanical thrombectomy.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 Reference Costs Grouper

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		
	RC16/17	RC15/16
Total HRGs	**8**	**8**
Total HRG Roots	**4**	**4**
Procedure-driven HRGs	8	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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
Total HRGs	**8**	**8**
Total HRG Roots	**8**	**8**
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	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+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 Reference Costs Grouper

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		
	RC16/17	RC15/16
Total HRGs	**12**	**12**
Total HRG Roots	**12**	**12**
Procedure-driven HRGs	12	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+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 Reference Costs Grouper

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, insertion of stent and nephrostomy procedures.

Composition and Concepts		
	RC16/17	RC15/16
Total HRGs	**8**	**8**
Total HRG Roots	**7**	**7**
Procedure-driven HRGs	8	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 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+ 2015/16 Reference Costs Grouper

No changes

No changes directly impacting this subchapter have been made in the HRG4+ 2016/17 Reference Costs Grouper when compared to the HRG4+ 2015/16 Reference Costs Grouper

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		
	RC16/17	RC15/16
Total HRGs	**60**	**60**
Total HRG Roots	**27**	**27**
Procedure-driven HRGs	49	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+ 2015/16 Reference Costs Grouper

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

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		
	RC16/17	RC15/16
Total HRGs	**58**	**58**
Total HRG Roots	**37**	**37**
Procedure-driven HRGs	58	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+ 2015/16 Reference Costs Grouper

Changes made to logic

In accordance with NICE guidance, logic has been amended to map insertion of bioabsorbable stents into peripheral blood vessels to **YR13Z Percutaneous Transluminal Angioplasty with Insertion of, Bioabsorbable, Drug-Eluting, Coated or Embolic Protection Stent, into Peripheral Blood Vessel,** to appropriately reflect resource usage. The label of this HRG has also been amended to more accurately reflect the content.

Changes made to incorporate ICD-10 5th Edition update

Changes to the ICD-10 diagnosis classification, implemented from 1 April 2016, have been incorporated into the HRG4+ design. Where a new code has been added, Expert Working Group advice has been used to determine the most appropriate HRG roots to which to map the new codes and has been used to confirm which specific lists the new codes should be on, e.g. CC lists.

The Documentation Suite

Below is a list of the various documents which are available to download from the National Casemix Office website http://content.digital.nhs.uk/casemix/downloads.

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 **Code to Group User Manual** explains how to make best use of the information found in the Code to Group Workbook. Specifically, the manual clarifies the grouping logic found in the workbook's Code to Group tab.
- The **ICD-10 5th Edition Update** outlines the changes to the HRG4+ 2016/17 Reference Costs Grouper made as a result of the 5th Edition update to the International Statistical Classification of Diseases and Related Health Problems – Tenth Revision (ICD-10), which is effective from 1 April 2016.