

National Interim Clinical Imaging Procedure (NICIP) Code Set to support PACS/RIS implementations – Editorial Principles

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1 Purpose

The document describes the use of a set of National Interim Clinical Imaging Procedure (NICIP) code set to support early PACS implementations and order communications prior to the introduction of fully SNOMED CT enabled applications. The current NICIP code set (DSCN 27/2009) **has been mandated and remains applicable** for all in-scope use cases across the NHS by the Information Standards Board for Health and Social Care (ISB). The information standard ISB 0148 can be viewed by visiting: <http://www.isb.nhs.uk/library/standard/125>.

New national governance arrangements for information standards, data collections and data extractions came into effect on 1st April 2017. On this date the Data Coordination Board (DCB) took over responsibility for the approval of standards from the Standardization Committee for Care Information (SCCI). ISB and SCCI approved standards remain in force. More information is available at: <http://digital.nhs.uk/isce>

This document describes the principles for the composition of the NICIP code set and the procedure descriptions it contains.

This document should be read when reviewing the NICIP code set for both initial development and on the occasion of any proposed changes.

This document will also describe the processes and procedures available for updating, approving and distributing changes to the NICIP code/description set.

The audience for this document are system suppliers and end users of systems.

2 Background

2.1 Scope

The National Interim Clinical Imaging Procedure Code set (NICIP) is a list of codes and descriptions for the coded and textual representation of Clinical Imaging Procedures in electronic systems in the NHS. Its use is specifically within imaging and related systems. This facilitates identification of procedures undertaken in an imaging examination along with the communication of clinical information associated with the identified procedures. The NICIP code set is overseen and endorsed by the Clinical Imaging Management Group (CIMG) which consists of key stakeholders across the NHS and also includes system supplier representation.

2.2 SNOMED Clinical Terms Clinical Imaging Procedures subset

All structured, coded clinical information will be represented using SNOMED Clinical Terms[®] (SNOMED CT).

It is therefore essential that Clinical Imaging procedures are represented effectively in SNOMED CT and that the terminology is used consistently throughout the electronic care record.

A subset of SNOMED CT concepts to describe Clinical Imaging procedures has been developed for the population of the relevant fields in systems.

The NICIP code set aids consistency in data recording and information sharing and hence improve data quality by mapping directly to the SNOMED subset.

This subset is maintained by CIMG.

2.3 NICIP to SNOMED mapping

It is expected that all clinical information systems will eventually standardise on the SNOMED CT terminology and coding system – including those in imaging departments. The NICIP code set has been designed with the limitations of current systems in mind to support the rapid deployment of PACS systems in England. The mapping to SNOMED CT will assist in the migration process from the NICIP code set.

The ‘Power of Information’¹ published in May 2012 set out the strategy for care information to deliver a range of benefits to patients and the public through better sharing of information. A key enabler for that is the proposal to base coded clinical information on a single clinical terminology of SNOMED CT. The National Information Board endorses the move to adopt SNOMED CT to support direct management of care and has stated that the entire health system should adopt SNOMED CT by April 2020.

All PACS and integrated clinical information systems were required to conform to this standard from 31st December 2010². The ‘interim’ code set was designed to bridge the gap until all clinical systems could support SNOMED CT and developed and maintained so that it remains closely aligned to the longer term strategic standard of SNOMED CT. It has always been expected that this interim standard would be replaced with SNOMED CT.

There is a tension between the increasing requirement to share and transfer coded data safely across health and care organisations and the time required to migrate to SNOMED CT. There are now a number of healthcare systems available based on SNOMED CT with several of these systems having been deployed in organisations for upwards of 3 years.

2.4 Interim coding scheme for existing PACS and RIS systems

2.4.1 Background

¹ The Power of Information

² <http://www.isb.nhs.uk/library/standard/125>

A great number of ‘off the shelf’ PACS and RIS systems were introduced throughout the NHS in England at a very rapid pace. All of these systems need procedure codes and descriptions to enable the business of imaging departments to be conducted effectively.

A collaborative effort from many parties produced the SNOMED CT Clinical Imaging procedures subset to support sharing of information between compliant systems. However, the first tranche of new, ‘off-the-shelf’ systems being rolled out in support of PACS cannot (technically) use either SNOMED CT codes or descriptions.

This requirement for a simple code scheme led to the development of the NICIP codes.

3 Principles underlying the composition of the interim descriptions

The composition of earlier lists was subject to variable levels of editorial control and as a consequence common components were often represented rather differently and representation was in some cases inconsistent. The editorial principles and associated processes described here represent an attempt to take the ‘best’ aspects of each of the forerunner lists to provide consistent guidance for the creation and on-going maintenance of the NICIP code set for as long as they are required.

The group originally set up to manage the SNOMED CT subset was also felt to be best placed to formally manage this interim representation.

The national standard SNOMED CT subset comprises simply modality (or imaging method), the body site and where necessary the laterality (by post-coordination) - these are the only aspects that would be expected to be communicated in coded, structured form. In the National SNOMED CT subset it was agreed that the descriptions should be clear and unambiguous both within and outside the diagnostic imaging business domain and that the descriptions should represent only ‘clinical’ activity and not administrative functions.

It is just as important that, in common with the SNOMED CT subset, the style of representation must be consistent. This therefore requires that consistent common representations for procedures of each modality for the interim representation be established. There are many facets of the description to consider - for instance word order, the use of prepositions, suffices and plurals.

Each facet of a procedure that could potentially be represented in a procedure description is described in the following sections.

All exceptions to the Editorial principles must be agreed by the CIMG and their submission must be accompanied by an explanation in the associated implementation guidance.

3.1 Modality (method)

Almost every diagnostic imaging procedure uses some form of energy (e.g. radiation or ultrasound) to produce a form of image – the ‘type’ of imaging performed is commonly referred to as the modality. Depending on the reason for differentiating between the

modalities or procedures, there is potentially a difference to the level of detail at which they could or should be described.

Traditionally the description has been used to help organise or measure work, describe equipment, the type of radiation employed as well as to differentiate between the actual procedures themselves.

In order to satisfy all of these apparent business needs it is therefore important to be able to categorise a procedure as being a type of one or more modalities.

The modalities (and sub-types) explicitly described in the interim list are as follows:

- Computed tomography (CT) including:
 - CT Angiography
 - CT Arthrography
- Fluoroscopy
 - Angiography
 - Venography
 - Interventional radiological procedures performed using fluoroscopy
- Magnetic resonance imaging (MRI)
 - Magnetic resonance angiography (MRA)
 - Magnetic resonance venography (MRV)
 - MRI Focused US ablation
 - Diffusion tensor MRI
- Nuclear medicine
 - Non-imaging therapeutic procedures
 - Positron emission tomography (PET)
 - Positron emission tomography with computed tomography (PET CT)
 - Single photon emission computed tomography (SPECT)
 - Single photon emission computed tomography with computed tomography (SPECT CT)
- Ultrasound (US)
 - Obstetric US
 - Doppler US
- Plain film imaging (x ray)
 - Mammography
 - Dual energy X-ray photon absorptiometry (DEXA)
 - X-ray tomosynthesis
- Endoscopy
 - ERCP (endoscopic retrograde cholangio-pancreatography)
 - VCE (video capsule endoscopy)
 - Endoscopic ultrasound
 - Endoscopic interventional procedures
 - Endoscopic procedures using imaging guidance (e.g. fluoroscopy)
 - ERCP and interventional procedure

- Cone Beam CT

Procedures relating to import and review of outside imaging and image processing are outside the scope of the NICIP code set and their historical inclusion (in the London catalogue) has not been perpetuated (as they are not imaging procedures). The accompanying implementation guidance provides a mechanism by which this activity can be achieved if required.

3.1.1 Modality-specific guidance

3.1.1.1 (Plain) X-ray

Plain X-Ray (e.g. Chest X-ray) - A plain radiograph obtained using conventional X-Rays; used mainly to demonstrate musculoskeletal, thoracic and some intra-abdominal problems.

These examinations are commonly expressed in a number of styles, examples include:

- **XR Ankle**
- X-ray of ankle
- radiography of ankle
- plain X-ray ankle
- radiological examination of ankle
- ankle X-ray

It has been agreed that the representation in the NICIP code set should be the first listed and, where required, all other forms would be synonyms.

3.1.1.2 Ultrasonography

Ultrasound - A cross-sectional imaging technique relying on the reflection of ultrasonic waves from various structures within the body; widely used for obstetric/gynaecological and abdominal problems but also for ever expanding roles elsewhere in the body (e.g. musculoskeletal).

Again, there are a number of ways this type of examination could be expressed, for example:

- **US Kidney Rt**
- Ultrasound of right kidney
- Ultrasonography of kidney, right
- Ultrasound scan right kidney

The recommendation for the NICIP code set is to use the first example and, where required, all other forms would be synonyms.

Ultrasound doppler is often referred to as ultrasound duplex. For the purposes of the interim procedure list the preferred representation will be the doppler, and duplex may be used as a synonym if necessary, e.g.:

- **US Doppler lower limb veins Both**

A number of requests have been received for the preferred representation of ultrasound duplex. The editorial principles relating to this procedure have been reviewed by the CIMG. The existing preferred method of representation was ratified by the CIMG in May 2008 and again in May 2012. Duplex will be added as a synonym to ultrasound doppler procedures where a request for this is received.

Obstetric ultrasound scans are more complex to describe and often much additional clinical information needs to be incorporated. NICIP codes are available to record multiple pregnancy procedures as it is acknowledged that these procedures may have greater complexity. However it has been agreed that the number of fetuses will not be incorporated into any NICIP description and therefore requests for the inclusion of twins, triplets, quads or descriptions such as fetus A, B or C etc will be declined.

NICIP codes are available for obstetric ultrasound which specify first, second and third trimester of pregnancy as it is acknowledged that different timings and resources are utilised depending on gestation. Codes of this nature are considered to be exceptions and new requests for the addition of timings such as “mid trimester” have been considered by the CIMG and declined. Further detail regarding stage of pregnancy is a scheduling issue for RIS systems and should be managed at a local level.

The CIMG in November 2008 considered requests for the addition of “Ultrasound fibroscan.” It was agreed that this procedure could be added to the NICIP codes with the description of Ultrasound elastography.

3.1.1.3 Computed Tomography

Computed Tomography (CT) - A cross-sectional, X-Ray imaging technique using a CT scanner, providing high contrast and high spatial resolution images.

There are a number of ways this type of examination could be expressed, for example:

- **CT Brain**
- Computerized axial tomography of brain
- CAT scan of brain
- Computerised tomography of brain

The recommendation for the NICIP descriptions is to use the first example, all others would be synonyms where required.

Requests for Cone Beam CT were submitted to the CIMG in November 2011. The request for these codes was referred for expert review and their inclusion agreed as a sub-modality of CT. However at the CIMG meeting in November 2012, following a request for a number of new additions, it was agreed that Cone Beam CT be treated as a separate modality from CT.

CT with phasing has also been considered by the CIMG following a number of requests. It has been agreed that the NICIP code set will not incorporate codes that express phasing. The issue of phasing should be managed locally and not shared outside of each department.

3.1.1.4 Cone Beam CT

Cone Beam CT is a medical imaging modality, which has been applied in different fields of medicine (*e.g.* cardiac imaging, radiotherapy). Recently, this technique has been applied to dental imaging.

The principle behind this technique, as its name implies, is a cone-shaped X-ray bundle, with the X-ray source and detector (Image Intensifier or Flat Panel Detector) rotating around a point (or field) of interest of the patient. The conical shape of the beam distinguishes this technique from helical CT, which used a fan-shaped beam. As a result of the acquisition of two-dimensional projections throughout this rotation, only one rotation or less is needed to acquire a full (three-dimensional) dataset. The images received by the detector are then compiled by the computer into volumetric data (primary reconstruction). This can then be visualized as two-dimensional multi-planar reformatted slices or in three dimensions by using surface reconstruction or volume rendering.

Cone Beam CT was originally accepted for inclusion by the CIMG in November 2011 after consultation with a dental radiology expert. Since then there have been a number of procedures requested that extend beyond dental. Cone Beam CT may be undertaken as an adjuvant imaging sequence to the main procedure and wouldn't usually be carried out in isolation other than for dental imaging. In November 2012 the CIMG agreed that Cone Beam CT should be a new imaging modality. These can now be identified in the short code with a first letter convention of "K".

3.1.1.5 Magnetic Resonance Imaging

Magnetic Resonance Imaging (MRI) - A complex cross-sectional imaging technique relying on the way in which tissues respond to radio-frequency stimulation when placed in a strong magnetic field.

As with CT and Ultrasound, the abbreviation of MRI is commonly used and accepted in clinical practice. It has therefore been decided to use the abbreviation MRI (or MRA for Magnetic Resonance Angiography and MRV for Magnetic Resonance Venography) as the representation for this type of DI procedure. As with previous modalities the first listed in the example below is the agreed NICIP code set representation, and where required, all other forms would be synonyms:

- **MRI Arthrogram wrist Lt**
- Magnetic resonance imaging of heart
- Abdomen MRI

The equivalent expressions for MRV and MRA follow the same pattern:

- **MRV Cerebral veins**
- **MRA Aorta abdominal**

3.1.1.6 Nuclear Medicine

Nuclear medicine (NM) is a branch of medicine and medical imaging that uses unsealed radioactive substances in diagnosis and therapy. These substances consist of radionuclides, or pharmaceuticals that have been labelled with radionuclides (radiopharmaceuticals). In diagnosis, radioactive substances are administered to patients and the radiation emitted is measured. The majority of these diagnostic tests involve the

formation of an image using a gamma camera. Imaging may also be referred to as radionuclide imaging or nuclear scintigraphy. Other diagnostic tests use probes to acquire measurements from parts of the body, or counters for the measurement of samples taken from the patient. In therapy, radionuclides are administered to treat disease or provide palliative pain relief.

Nuclear medicine imaging tests differ from most other imaging modalities in that the tests primarily show the physiological function of the system being investigated as opposed to the anatomy. In some centres, the nuclear medicine images can be superimposed on images from modalities such as CT or MRI to highlight which part of the body the radiopharmaceutical is concentrated in. This practice is often referred to as image fusion. PET CT is a complex cross-sectional imaging technique combining the data from a sophisticated Nuclear Medicine technique (Positron Emission Tomography) with CT (above).

The optimal representation for Nuclear Medicine procedures is as follows:

- **NM Bone whole body**

SPECT and PET are considered sub-types of Nuclear medicine and will be represented in the list as follows:

- **NM Bone local ankles feet SPECT**
- **NM Parathyroid scan SPECT**
- **NM Brain study PET**

Where SPECT or PET procedures are performed in conjunction with CT, they will be represented in the NICIP code set as follows:

- **NM Lung perfusion SPECT CT**
- **NM Methionine tumour local PET CT**

The words scan and study are perhaps superfluous but often aid readability so are permitted but not mandatory. The CIMG have concluded that the radioisotope used should be excluded from the procedure description unless absolutely necessary. Exceptions to this editorial principle have been considered by the CIMG and it has been agreed that procedures which use either MIBI (Methoxyisobutylisonitrile) or Tf (Tetrofosmin) will be acceptable for inclusion within the NICIP code set.

There are occasions where it is necessary to have a dual representation both of the locality and nature of the body site for NM procedures – e.g. thorax and bone for a NM study of the bone structures (but not other contents) of the chest cavity for example:

- **NM Bone study thorax**

Nuclear medicine is a particularly complex field as often the technique and/or the site is not representable in the same simplistic logical fashion as can be applied to most other modalities. These editorial principles will be extended iteratively as and when decisions on representation are made and will be applied in later releases of the NICIP code set.

In the NM domain there are rather more exceptions than in other modalities, however, consistent expressions have been adopted wherever possible, but occasionally, non-

standard essential aspects of the examination will also be expressed in the description for example:

- **NM Red cell mass estimation**

A number of NM procedures include information related to the timing/phasing of the examination for example:

- **NM Bone local ankles feet early**
- **NM Bone local ankles feet late**

This information was felt to be outside the existing editorial principles.

The group concluded that the phasing information was indeed necessary although the nature this is expressed was sub-optimal.

The site representation was also felt to be flawed as the level of detail expressed and hence the number of procedure codes incorporated was unnecessarily high. The preferred representation would be:

- **NM Bone local peripheral single phase**
- **NM Bone peripheral dual phase**
- **NM Bone whole body single phase**
- **NM Bone whole body dual phase**

Nuclear medicine heart studies may or may not be gated. Where required, two procedure codes will be added:

- **NM MPS Thallium rest and Redist gated**
- **NM MPS Thallium rest and redistribution**

3.1.1.7 Fluoroscopy

Fluoroscopy is an X-Ray screening technique used to show dynamic processes within the body; a barium enema is a good example whereby the large bowel is opacified and observed under direct fluoroscopic screening.

Most fluoroscopy is carried out to support a more invasive procedure such as arthrography or angiography. However, these invasive aspects may also be conducted in conjunction with other imaging guidance such as Ultrasound (nephrostomy) or CT (arthrography).

Common practice within the DI domain is to assume that unless stated explicitly, the type of imaging used to support the invasive element is fluoroscopic. Therefore to avoid lengthening the descriptors, this need not be explicitly described, for example the following are all acceptable descriptions:

- **Arthrogram ankle Left**
- **Bile duct calculus removal**
- **Cardioversion**
- **Proctogram**

It can be seen from the second and third items above that it is even possible that no form of imaging is explicitly stated.

Where it is necessary to explicitly indicate the fluoroscopic nature of the imaging, the following section will describe the alternatives. The order of words in the description is not significant as long as one of the synonyms has fluoroscopy/fluoroscopic (or an agreed abbreviation) as the first word in the string - parentheses should not be used. 'Fluoroscopy' is the preferred fully expressed description for simple fluoroscopy, 'Fluoroscopic' is the preferred fully expressed description, for the more commonly encountered, fluoroscopy to support an invasive procedure.

The application of these rules can be seen in the following examples:

'Legacy' representation	Approved representation	Synonym required
Sialogram Submandible (Fluoro) Lt	Sialogram submandibular fluoroscopic Left	Fluoroscopic submandibular sialogram
Fluoro Guided Aspiration (Upper) Abdomen	Fluoroscopic guided aspiration abdomen (nb no recognised need for 'upper')	
Fluoroscopy Hip Lt	Fluoroscopy hip Left	
Intussusception Reduction(Fluoroscopic)	Intussusception reduction fluoroscopic	Fluoroscopic intussusception reduction

The angiographic variants of fluoroscopy procedures would utilise the following style:

- **Angio cerebral**
- **Angioplasty hepatic**
- **Angio aorto-femoral lower limbs**
- **Arterial stent subclavian Lt**
- **IV DSA carotid**

It can be seen that where angiography only is undertaken, the truncated form 'Angio' is used to minimise the length of the text string length. Where additional techniques/procedures are applied (e.g. angioplasty), then they are explicitly stated and the angiography aspect implied.

Where the focus of the procedure is maintenance or screening of a device, it is important to capture this information. It is acceptable to include all of the following variants in NICIP descriptions/synonyms:

- **Cardiac defibrillator change**
- **Cardiac defibrillator upgrade**
- **Cardiac defibrillator implant**
- **Cardiac defibrillator check**

The terms 'change' and 'upgrade' have been considered by the CIMG and are acceptable synonymous terms to describe replacement of a device.

3.1.1.8 Dual energy X-ray photon absorptiometry

Dual energy X-ray absorptiometry (DXA or DEXA) is a means of measuring bone mineral density (BMD). Two X-ray beams with differing energy levels are aimed at the patient's

bones. When soft tissue absorption is subtracted out, the BMD can be determined from the absorption of each beam by bone. DXA is the most widely used and most thoroughly studied bone density measurement technology.

Commonly known as a bone density scan or bone densitometry, DXA scans are used as a screening and diagnostic test for osteoporosis. The bones that are most commonly fractured in humans with osteoporosis are scanned for screening purposes, although osteoporosis can occur in any bone and is not necessarily uniformly distributed in the skeleton. These include the proximal femur, and the lumbar spine. Under some circumstances, the distal radius and ulna are also scanned, usually in obese patients, or those whose orthopaedic impairments make scanning of the spine and hips impossible.

There are a small number of these scans in the NICIP code set. The unambiguous description adopted in the code set will be in the following format:

- **Bone mineral densitometry DXA**

3.1.1.9 Dual energy computed tomography

Dual energy computed tomography (CT) is an X-Ray imaging technique using a dual energy CT scanner that uses both the normal X-ray and also a second less powerful X-ray to make the images. This gives dual energy CT additional advantages over standard CT for a wide range of tests and procedures.

There are a number of ways this type of examination could be expressed, for example:

- **DECT of thorax**
- Dual energy CT of thorax
- Dual energy computed tomography of thorax

The recommendation for the NICIP descriptions is to use the first example, all others would be synonyms where required.

Requests for DECT were submitted to the CIMG in November 2014. The request for these codes was referred for expert review and their inclusion agreed as a separate modality from CT.

3.2 Functional domain-specific principles

3.2.1 Breast imaging

Imaging of the breast can involve many modalities and techniques. Described below are the editorial principles to be applied specifically to these procedures.

1. Each modality group will have right, left and bilateral. All modalities will be included even if little used or unused — mammogram, ultrasound, MRI, Nuclear Medicine (scintimammography +/- SPECT, FDG PET), pneumocystogram, mammary ductogram, electrical impedance imaging, thermography, transillumination spectroscopy, x-ray tomosynthesis.

2. Mammographically guided biopsy may be by using a plate (fenestrated or otherwise) or using a Stereotactic device.
3. Stereotactic mammography - including prone or upright positioning: The CIMG (May 2016) considered that the average costs assigned to this tariff would be included for both prone and upright procedures and decided that this level of detail should not be included in the coding system.
4. Pathology specimens may undergo mammography or ultrasound and the type of specimen will usually be defined by local code if needed. An exception to this is in the case of x-ray of soft tissue specimen which has been added to the NICIP code set as it is acknowledged that post-processing requires different filters for specimens of this type.
5. There will be times when more than one modality group will need to be recorded against an examination e.g. US + Radionuclide injection = US + NM to allow correct KHI2 statistics, nuclear medicine waste control, etc.
6. Mammographic projections are important and reflect additional workload and will be coded as “Mammography Extra Views” e.g. magnification, extended, lateral, compression.
7. Interventional procedures will be described with modality and intervention. Typical interventions are as follows: MR - FNA, core biopsy, FNA and core, VAC (vacuum assisted biopsy) [trade names will not be used e.g. Mammotome], aspiration, aspiration and cytology, drainage, skin marking, guide wire localisation, marker insertion, and injection.
8. Breast CT is only required for radiotherapy planning.
9. Excisions are not diagnostic procedures and should be coded with other treatments e.g. US Vacuum assisted biopsy. The subsequent excision of fibroadenoma is a separate procedure not in scope of the CIMG.
10. Associated examinations are axillary and supraclavicular fossa ultrasound +/-biopsy for axillary ultrasound. There will be miscellaneous biopsy codes which can be used in an ad hoc way where there is no more appropriate code.
11. A new set of codes for breast screening procedures was added to the April 2011 release following consideration by the CIMG. These codes are XR screening mammogram and MRI breast screening (plus lateralised variants). Additional requests for NICIP codes to record breast assessment imaging procedures (such as assessment mammography, assessment ultrasound and assessment biopsy) were considered by the CIMG. These requests were declined on the basis that these assessment codes are required for patient recall and in these circumstances procedure specific codes such as extended, compression and lateral are available.

3.2.2 Interventional Radiology

The broad meaning of ‘interventional’ in a radiological setting is not the fact that the body has been entered but that a treatment has been given by entering the body.

Furthermore, ‘interventional’ imaging procedures are primarily conducted for treatment rather than diagnosis.

They will often utilise various devices which should be represented in a generic fashion.

3.2.2.1 Devices

Where a device is specified and no action in connection to it, then the default action is ‘insertion’.

The types of actions/procedures that would need to be represented include:

- **Embolisation (coils, balloons, polymer)**
- **Ablation (radiofrequency/ultrasound)**
- **Removal (of object/device)**
- **Repositioning/adjustment (object/device)**
- **Change (object/device)**
- **Check (object/device)**
- **Biopsy (Core or FNA or Vacuum assisted)**
- **Drainage (where device is left in situ)**
- **Insertion (of device such as stent)**
- **Injection (as an objective of the procedure, not as part of the preliminary to this objective)**
- **Lithotripsy**
- **Aspiration**
- **Plasty (‘repair’ as in angioPlasty or dacrocystoPlasty)**
- **Extraction (as in retrieval of intravascular foreign bodies or biliary stone)**

It is acceptable to express terms which differentiate between the possible methods of the intervention e.g. Atherectomy, atherectomy cutting balloon, atherectomy laser, atherectomy rotor but should not go down to the level of detail of any proprietary device.

The expression of the relative size of device, for example small, medium, large, giant, was discussed by the CIMG in May 2008. The CIMG concluded that the expression of size described in the format of those given in the example should be excluded as they do not give a quantifiable measure of size. Cost implications associated with size of device should be coded in the procedure description when there is a costing model defined.

Where imaging is undertaken to support an interventional procedure (e.g. when an US scan of breast is performed) it is not necessary to use a separate code for the interventional aspect and a code for the imaging. These can be combined and the description should include the imaging guidance technique and the intervention (or the intervention alone in the case of fluoroscopy).

In this example, where there is also a full diagnostic examination performed then the description US of breast should also be assigned. There is therefore a need for both flavours of descriptions in the interim solution.

Therefore in the case where a full diagnostic US of the left breast is performed and a fine needle aspiration and core biopsy under US guidance is also performed then the following combination of concepts should be entered:

- **US Breast Left**
- **US Guided FNA breast Left**
- **US Guided core biopsy breast Left**

It has been agreed that the generic equivalent of any proprietary device should be used in the NICIP procedure description. The devices that can be used include the following:

- **Stent**
 - **Drug eluting stent**
 - **Metallic stent**
 - **Plastic stent**
 - **Bio-degradable stent**
- **Stent graft**
 - **Branched bifurcated stent graft**
 - **Branched tube stent graft**
 - **Branched tapered stent graft**
 - **Fenestrated stent graft**
- **Prosthesis**
 - **Coil**
 - **Balloon**
 - **Drug eluting balloon**
 - **Polyvinyl alcohol (PVA) particles**
 - **Glue**
 - **Onyx**
 - **Alcohol**
 - **Vascular closure device**
 - **Polymer**
 - **Filter**
 - **Catheter/line/tube**

Similar principles apply to surgical material for example:

- **Tube stent graft**

It was concluded by the CIMG that the generic equivalent of any proprietary line/catheter should be used in the interim procedure description.

The following illustrate some proprietary examples with their generic equivalent:

Proprietary name	Generic representation
Tenkoff Line	Continuous ambulatory peritoneal dialysis line or CAPD line
Hickman line and Portocath	Peripherally inserted central catheter (or PICC), also known as subcutaneously tunnellled catheter
Cardiac Swan Ganz Line	Pulmonary catheter
Arrow-Howes multilumen	Central venous catheter
BROVIAC catheter	Tunnellled catheter
Cardiac Radi wire	Cardiac pressure wire and catheter insertion

3.2.2.2 Ablation agents

Where the procedure being undertaken is an ablation, it is necessary to specify the agent of the ablation, e.g. coil, ultrasound, alcohol, radiofrequency etc.

3.2.3 Dental Radiography

Descriptions for most Dental imaging follow the same pattern as that for 'plain' X-rays but include the domain description 'dental', i.e. the following are agreed representations:

- **XR Dental mandibular occlusal**
- **XR Dental intraoral lower occlusal**
- **XR Dental intraoral molar**
- **XR Dental oblique lateral Both**
- **XR Dental oblique lateral Lt**
- **XR Dental oblique lateral Rt**
- **XR Dental periapical 5**
- **XR Dental intraoral parallax**
- **XR Dental periapical 10**
- **XR Dental periapical 10 plus**
- **XR Dental intraoral periapical**
- **XR Dental periapical full**
- **XR Dental intraoral premolar**
- **XR Dental maxillary occlusal**
- **XR Dental intraoral upper occlusal**
- **XR Dental intraoral vertex occlusal**
- **XR Dental bitewing**

Technique adjustments are therefore included for periapical, occlusal films and parallax and vertex directional adaptations.

3.2.4 Endoscopy

Endoscopy is a term used to describe a process for examining the inside of the body using an endoscope with a fiberoptic camera. This process facilitates a greatly magnified image projected onto a video screen. Endoscopes can be used for a range of procedures including inspection of the respiratory, urinary or reproductive tract, investigation of the abdominal or pelvic cavity and inspection of joint structures. Endoscopy may also be also used to provide access for diagnostic or interventional procedures, such as endoscopic ultrasound, biopsy, aspiration or drainage.

A small number of endoscopy procedures had originally been incorporated into the NICIP code set to facilitate the implementation of PACS and RIS systems. These endoscopy procedures were high level and relatively few in number within the NICIP code set. An expert group for GI endoscopy was convened in March 2011 with the purpose of reviewing endoscopy procedure code coverage within the NICIP code set. A long list of proposed endoscopy codes was reviewed by the domain specific expert group (including representation from the British Gastroenterological Society). It was agreed that the following procedures should be represented:

- Upper GI endoscopy
- Video Capsule endoscopy

- Colonoscopy
- Enteroscopy
- ERCP
- Endoscopic US
- Rigid sigmoidoscopy
- Flexible sigmoidoscopy
- Proctoscopy

An additional small number of non-GI endoscopic procedures were considered by the CIMG in November 2011 and accepted for inclusion. These codes are:

- Laparoscopy
- Ureteroscopy
- Urethroscopy
- Hysteroscopy
- Fallopscopy
- Ovary endoscopy
- Fetoscopy
- Arthroscopy
- Thoracoscopy
- Sialoscopy
- Brain endoscopy
- Pharyngoscopy
- Endoscopy of respiratory system
- Mediastinoscopy
- Cystoscopy

Following further stakeholder engagement in March 2012 it was agreed that the scope for inclusion of endoscopy procedure codes would be widened to include combined diagnostic imaging and endoscopy procedures.

3.2.4.1 Domain specific principles for endoscopy

New submissions for endoscopy content must conform to existing NICIP editorial principles. Where there is a gap in the principles or further consideration is required, new requests will be escalated to the CIMG for a decision regarding inclusion. The agreed term construction for endoscopy guided procedures will be endoscopic:

Example:

- **Endoscopic US stomach**
- **Endoscopic US FNA stomach**

Diagnostic intent is the default context in NICIP and therefore diagnostic will not be expressed in NICIP endoscopy codes. Procedure codes will usually be body site specific with the level of granularity in accordance with existing NICIP editorial principles. Requests for new codes which fall outside of this scope will be considered on a case by case basis by the CIMG. Use of catch all terms such as “other” and “either/or” is not permissible. Whilst it is acknowledged that performer of procedure is important information, this information will not form part of a NICIP code and should be captured using system functionality.

In accordance with existing NICIP editorial principles the inclusion of a disorder or abnormality in a NICIP code description is only acceptable if it alters the technique. The body site specific code should be utilised.

Example:

- **Balloon dilatation of Achalasia**

Should utilise the code

- **Endoscopic guided oesophageal dilatation**

Fluoroscopy is the default modality where no other modality is stated. This is required due to the 40 character restriction in NICIP descriptions.

Example:

- **Endoscopic guided oesophageal stent**

This is a fluoroscopy guided procedure with a default action of insertion. Endoscopy must be stated within the NICIP description. Information regarding acceptable acronyms and abbreviations can be found in Appendix A.

3.2.4.2 Endoscopic Retrograde Cholangio-pancreatogram

ERCP is a diagnostic test to examine the duodenum, the papilla of Vater, the bile ducts, the gallbladder and the pancreatic duct. This exam is commonly expressed in a number of styles for example:

- **ERCP**
- Endo Retrograde Cholangiopancreatogram
- End retrograde choledochopancreatography

The representation of ERCP will be the first listed with all others as synonyms if required. Note that all ERCPs whether diagnostic or therapeutic involve the use of fluoroscopy. In addition interventional procedures done in conjunction with the ERCP (such as balloon dilatation) will also utilise fluoroscopic guidance.

Due to the nature of ERCP studies there may be a number of different and distinct operational procedures associated with one initial single diagnostic examination. The first requirement to request ERCP may be met using the generic ERCP code. Any subsequent requirement to further refine the nature of the intervention performed at the time of the ERCP can be met using a single granular code. For example, an ERCP is requested for a patient with a suspected diagnosis of biliary obstruction. At the time of ERCP the diagnosis is confirmed resulting in the removal of biliary calculus. The original requested procedure code would be that of ERCP. However the subsequent record for the procedure actually undertaken would use a single granular procedure code - ERPC Removal calculus.

3.2.4.3 Endoscopic Ultrasound

Endoscopic ultrasound is a procedure that combines endoscopy and ultrasound to obtain images and information about the body structure being examined plus surrounding tissue and organs. In endoscopic US a small ultrasound transducer is installed on the tip of the endoscope allowing the transducer to get close to the organs inside the body, such as the uterus, liver, gallbladder, pancreas, aorta, so the resultant ultrasound images are often more accurate and detailed than ones obtained by traditional ultrasound.

The preferred representation in NICIP descriptions will consist of Endoscopic US followed by the body structure and/or intervention.

Example:

- **Endoscopic US oesophagus**
- **Endoscopic US FNA oesophagus**

3.2.4.4 Video Capsule Endoscopy

Video (wireless) capsule endoscopy is an endoscopic investigation for visualisation of the entire small bowel. A pill sized video camera is swallowed by the patient and the video is transmitted wirelessly to a receiver worn by the patient. The procedure is purely diagnostic. The preferred representation in NICIP is:

- **Video capsule endoscopy**

3.2.4.5 Endoscopic interventional procedures

Where imaging is undertaken to support an interventional endoscopic procedure (for example fluoroscopic guidance) it is not necessary to use a separate code for the interventional aspect and a code for the imaging. These can be combined and the description should include the imaging guidance technique and the intervention (or the intervention alone in the case of fluoroscopy).

Examples:

- **Endoscopic guided enteric stent**
- **Endoscopic oesophageal stent removal**

Where a device such as a stent is utilised in any interventional procedure it has been agreed that the generic equivalent will be used - further information regarding agreed representation of devices can be found in Section 3.2.2.1.

3.2.4.6 Endoscopic brush/forceps biopsy

Although previously declined for inclusion on the basis that brushing/forceps does not significantly alter the biopsy it was agreed at the November 2012 CIMG that these are acceptable additions.

Examples:

- **EUS Brush biopsy lesion pancreas**
- **ERCP Forcep Bx ampulla Vater**

3.2.5 Cardiac Imaging Procedures

After working in consultation with a cardiac imaging special interest group, a number of domain specific representations and editorial principles have been agreed.

A small number of magnetic resonance cardiac imaging procedures have been added to the NICIP code set. It was agreed that the descriptions for these new codes will utilise the term 'morphology' to represent the anatomy and structure of the part of the heart that is being imaged. For the purpose of these codes it is assumed that morphology will not be imaged without also undertaking an assessment of function. Function therefore represents

the dynamic part of the imaging procedure. Where contrast is always utilised for a particular cardiac MR procedure, for example for myocardial viability or perfusion, this will not be expressed within the description. Where a cardiac MR procedure can be carried out without the use of contrast, both variants of the procedure will be added to the NICIP code set.

Examples:

- **MRI Cardiac morphology function**
- **MRI Card morphology function velocity**
- **MRI Card morphology Func velocity stress**
- **MRI Card Morph Func velocity with Cont**
- **MRI Card Morph Func velocity stress Cont**

A number of computed tomography cardiac imaging procedures have been added to the NICIP code set. It was agreed that these procedures will prefer use of the word 'cardiac' within the descriptions as opposed to heart. Heart may be used as a synonymous term where this is requested. It was agreed to specify 'gated' in the NICIP descriptions. The rationale for doing so is to support the accuracy of clinical coding.

Examples:

- **CT Cardiac gated**
- **CT Cardiac gated with contrast**
- **CT Cardiac gated function with contrast**

A request for the addition of cardiac imaging with either prospective or retrospective study specified within the descriptions was considered. It was agreed that there are differences with post processing and subsequent analysis of the scans in prospective and retrospective studies. However the choice of technique does not form part of the procedure request and a decision is usually made at the time the scan is being undertaken. On this basis it was decided that the inclusion of prospective/retrospective study will not be permissible.

3.2.6 Clinical photography (including ocular photography)

The scope of the NICIP code set has expanded to include clinical photography. A generic code for clinical photography has been added to the NICIP code set and is available along with a number of body site specific codes.

The principles for describing these procedures should be exactly the same as for plain X-rays but will have the additional description clinical photography (Clinphoto is abbreviated form) as the modality. The short code will start with an O for both general photography and ophthalmic photography.

Example representations are as follows:

- **Clinical photography lower limb Right**
- **Clinical photography torso**

3.3 Body site

Almost all imaging procedures will have a target 'site' for the imaging, whether this is a discrete body part or a complete subsystem.

There will be, however, a number of procedures which will not ordinarily contain a fully specified target site in the description but need to be included in the NICIP code set. For example 'barium meal' does not include the site (stomach or upper GI tract) in the description – this is an agreed exception.

There will also be descriptions of the type 'CT guided biopsy' where the multitude of potential lesion sites prevent the pre-coordination of every possibility.

There are other examples of interventional type procedures which it would be problematical to pre-coordinate with every single body site on which they may be performed. Examples of allowable exceptions are therefore:

- **Intravascular foreign body retrieval**
- **Linogram**
- **NM Y90 antibody therapy**
- **US Guided aspiration**

Specifically with regard to blood vessels it was agreed, for non-interventional procedures, that there was a level of detail beyond which pre-coordination of vessels was not useful and potentially confusing. It was suggested that this would be below the level of branches of the aorta. In which case, the following would not be allowed:

- Angioplasty infrapopliteal Lt
- Angioplasty anterior tibial Lt

For interventional procedures then a further level of detail is permitted down to the main vessels of the long bones, i.e. tibial and radial/ulnar arteries and to sub-branches of branches of the aorta, e.g. sub-branch of renal artery. There are also some neurological interventional procedures that will require further detail and be made exceptions to this principle.

For procedures performed on the main vessel of an organ it is permissible to use the vessel or the organ in the preferred description for the item – the other alternative might usefully be included as a synonym for example;

- Angio penile (preferred)
- Angio penis (synonym)

3.4 Laterality

Laterality provides information on whether the procedure being performed on a body site is on the left, right or on both sides (or none of these for mid-line structures). Laterality will be pre-coordinated for appropriate body sites in the descriptions.

The plural form of a body site should not be used to mean both sides.

Laterality is always expressed at the end of the description and expressed as Lt (for left), Rt (for right) and Both (for bilateral), even where a suitable plural exists (e.g. MRI Knees would be MRI Knee Both). Where an abbreviation for 'Both' is required, this would take the form of 'B'.

3.5 Associated Procedure/Disorder

Many imaging procedures are undertaken in a particular way to effectively image a particular suspected condition/abnormality. Sometimes this information is vital to support the business of the service department and on other occasions is less so.

Timing/condition specific examinations should not be included in the list except in exceptional circumstances, for example:

- **XR Hand wrist (bone age)**

The following are unacceptable:

- US Pelvis For IUCD (TA)
- US Pelvis for IUCD (TV)
- US For Nephrostomy Puncture
- ERCP via post operative stomach

It has further been agreed that the pathology/morphology should be excluded from the description – the following would therefore be disallowed:

- MRI temporal lobe epilepsy
- MRI cord compression

Only where the pathology is the actual target of imaging of the interventional procedure or where the pathology causes the examination performed to be significantly different would it be permitted, for example:

- **US Guided renal cyst drainage Both**
- **Embolisation of uterine fibroid**
- **Cardiac Angio congenital anomaly study**
- **MRI Cardiac congenital anomaly study**
- **MRI Pelvis gynaecological**

It has been determined that where imaging is targeted at, or a technique is adapted because of a congenital anomaly, then this should be stated as part of the procedure description. Similarly it was agreed that where the procedure involves specific and different sequences as in the case of MRI Pelvis gynaecological, it can be considered an exception to the rule described above.

Examples of expressions that describe a characteristic of a patient not directly related to the procedure and would not be permitted are the following:

- MRI claustrophobic
- MRI antenatal

At the CIMG November 2012 it was agreed that drainage and insertion of drain are semantically the same and can therefore be used as interchangeable synonyms in NICIP.

3.6 Perioperative and percutaneous procedures

Many imaging procedures are performed as an essential part of a surgical operation. Of the three ways of describing procedures performed during surgical operations the convention for this list will be to describe them as perioperative. The alternative descriptions of 'operative' and perioperative can be used in synonymous descriptions.

In the interests of minimising description length, the use of the word percutaneous is not essential unless there is a perioperative equivalent in which case both variants will need to be explicitly represented. Unless stated otherwise, the default approach will be percutaneous for all interventional procedures.

3.7 Contrast

For some procedures the use of radiographic contrast media is implicit and understood to be a standard part of the procedure (e.g. angiography, arthrography). Where contrast use is not implicit, only the variants 'with contrast' and the base procedure with no mention of contrast – e.g. 'CT brain with contrast' and 'CT brain' will both exist as separate codes. A patient having a procedure 'with and without contrast' (e.g. a CT brain scan) should be coded as a single procedure 'with contrast' unless the procedure is performed as 2 separate examinations and reported separately.

However, even where contrast is not explicitly stated it cannot always be assumed that contrast was not used.

It should also be noted that the generic description of "contrast" (when not further qualified), actually means intravascular contrast. This is with the exception of arthrogram procedures where use of contrast is also implicit in the procedure but where the contrast is injected directly into the joint. For all other cases, use of contrast via a route other than intravascular will be explicitly specified e.g. intrathecal contrast.

Though generally it is accepted that contrast is used in angiography procedures this is not necessarily true for MR Angiography where delineation of the blood vessels can be accomplished by other means. Additionally MRI Arthrography procedures may or may not also utilise intravascular contrast. In these cases when intravascular as well as intra-articular contrast is utilised it must also be specified in the description. E.g. MRI arthrogram with contrast.

The route and method of administration may also form part of the description when significant.

The substance of which the contrast is composed is not permitted except in exceptional cases to be justified by a submitter.

The generic representation of ‘contrast’ or ‘water soluble contrast’ should always be described rather than the brand name or the substance, except for agreed exceptions such as ‘barium’.

The term ‘contrast’ is the adopted description in preference to such alternatives as ‘enhanced’.

The representation will therefore be:

- **Water soluble contrast enema**
- **MRI Axilla with contrast Both**
- **CT Adrenal with contrast**
- **CT IAM with intrathecal contrast**
- **XR Intravenous cholangiogram**
- **CT IAM with air contrast**

And not:

- Breasts MRI + Gd
- CT abdomen With/Without Contrast
- CT adrenal enhanced
- Gastrografin enema
- Hypertonic enema

3.8 Administrative aspects

It has traditionally been the case that administrative aspects have been introduced into procedure descriptions. However, in the NICIP code set this is permitted only where a valid use case can be demonstrated and it makes a clinically significant difference to the nature of the examination performed.

3.8.1 Location

Many examinations may be performed in more than one business area and this may have implications for resource allocation in particular (e.g. room/equipment usage and staff allocation). This differentiation is not permitted in the procedure description, therefore the following is not allowed:

- Mobile Chest X-ray
- Skull X-ray resus

However there are a small numbers of exceptions where the location is required for differentiation in the Körner banding, in which case the description has been permitted as an exception. These are almost entirely regarding the use of image intensification, for example:

- **Mobile image intensifier abdomen**

3.8.2 Report

Most procedures require a formal radiological opinion, however some do not. This fact should be considered an administrative property and should not be represented in the procedure description. The following would therefore not be permitted in the list:

- X-ray upper occlusal – no report required

This information should be reflected in other facets of the information system and not in the procedure description.

3.8.3 Procedure status

During the lifecycle of a procedure it can have many statuses including 'requested', 'completed', 'scheduled', 'reported' or even 'cancelled' or 'abandoned'. All of these are statuses of the procedure rather than being types of procedure.

There is thus no national requirement for descriptions such as 'Procedure abandoned'. As such, procedure status is another administrative property and should not be represented in the procedure description.

3.8.4 Visit information

Many procedures are performed over a number of visits to an imaging centre. It is often important to know which stage of the procedure is to take place so that correct techniques/protocols are observed for that particular visit as part of a single procedure, for example radionuclide study for colonic transit day 1, day 2, day 3 etc. This information is not required outside the performing image department. As such, it was agreed that visit information is an entirely administrative property and should not be represented in the procedure description but should be reflected in other facets of the electronic record. In summary, examination descriptors should not contain any administrative or scheduling information.

The following would therefore not be permitted:

- Oral Cholecystogram - Control
- Oral Cholecystogram - Post Oral Contrast
- XR Colonic Transit Study Day 1 to Day 10
- US Breast Recall
- NM Gastrointestinal Bleed (2 Hours)
- Metabolic imaging - fasting

3.8.5 Performer

The CIMG have agreed that the performer should not be included in the procedure description. The following would therefore be disallowed:

- Percutaneous stone extraction Radiologist
- Percutaneous stone extraction Urologist

3.9 View/Projection/Technique adjustments

It is often important both clinically and from an administrative perspective that variations in technique (from the norm) are captured, not least so that images can be both acquired and interpreted correctly. Those that have been explicitly agreed as permitted in the current list of descriptions are:

- Soft tissue
- Stress
- Periapical (for dental)
- Occlusal (for dental)
- Upright (for mammography)
- Prone (for mammography)

It is important to note that these would not exist as procedures in their own right but would be used as part of a complete procedure description (including modality, site etc). The rationale for inclusion is where the projection will significantly alter the examination being performed.

Those that it has been agreed will be excluded on the basis that they do not normally significantly affect the performance of the procedure (in terms of clinical requirements) include the following:

- Axial
- Skyline
- Lateral
- Decubitus
- Weight-bearing
- Penetrated
- Paediatric
- Flexion/Extension
- Magnification
- Compression
- Challenge
- Selective
- Minimum prep
- Low dose
- Rosenberg
- Sub-talar
- Cobey
- Westpoint
- Zanca

It has further been decided not to include specific named projections i.e. judets, frog lateral, stryker's. At the CIMG November 2012 specialised orthopaedic projections were also excluded as the procedure remains the same despite the nature of the projections. e.g. Rosenberg view of knee, Sub-talar view, Cobey's views. This information can be treated as additional local information using system functionality.

There are occasions when the sequencing of MRI scans is important to capture so the following are permitted:

- **MRI Diffusion weighted**

- **MRI Functional imaging**
- **MRI Perfusion weighted**

These are in addition to the previously mentioned many variations in radionuclide imaging studies.

3.10 Approach/route/method of administration

This should always be included where it provides the main differentiation between two otherwise apparently similar procedures for example:

Oral cholecystogram is significantly different to a T-Tube cholecystogram.

The following are all therefore acceptable:

- **Oral cholecystogram**
- **US Pelvis transvaginal**
- **Intravenous urogram**
- **Venogram hepatic transjugular**

3.11 Proprietary descriptions

Many investigations have been known either partly or totally by the name of the company that first introduced the technology or by a particular pharmaceutical/contrast medium – e.g. ‘Mammotome’ (breast imaging and biopsy apparatus) or ‘MRI Alkermes’ (drug delivery equipment manufacturer).

Unless the use case for having this representation can be justified to the management group, and considered as legitimate exceptions, then these should be represented more generically – for example in the form of ‘Vacuum assisted biopsy breast’ in the case of the ‘mammotome’.

It has been agreed that commercial/proprietary names for radiopharmaceuticals, drugs and other substances should not be a part of any term description (exceptions will be documented).

The following would therefore be disallowed in favour of generic equivalents:

- NM CEA (Oncoscint) Scan
- NM Indium Capromab (ProstaScint) Scan
- NM Brain Bicasate (Neurolite) SPECT
- NM Card Gated Dipyridamole Stress MIBI (Dipyridamole is the stressing agent)
- NM Cardiac Dobutamine Stress MIBI

Any substance delivered (infused, injected, imbibed etc) should be represented by its generic equivalent for example:

- Shoulder arthrogram depomedrone injection

would become:

- **Arthrogram steroid injection shoulder**

3.12 Research activities

Research procedures and trials (of equipment or drugs) are undertaken in local environments so the descriptions would be of very limited utility nationally. They should therefore be created and maintained in the local environment and not communicated outside that environment.

3.13 Forensic Radiography

The CIMG have agreed that forensic radiography differs from standard radiography, and therefore there is a requirement for some differentiation in NICIP codes. However it was not deemed necessary to add a forensic variant to any body part that can be imaged. Three generic modality codes have been added to be used in conjunction with a conventional site specific code (without forensic). These codes are:

- **CT Forensic**
- **MR Forensic**
- **XR Forensic**

3.14 Post Mortem Radiography

Following on from point 3.13 above, requests have also been received for post mortem concepts. Further discussion on the differentiation between ‘forensic’ and ‘post mortem’ suggests that, for the purposes of imaging procedures, ‘forensic’ is taken to relate to procedures with legal implications, where post mortem procedures do not necessarily involve police etc. As with the Forensic Radiography additions, generic codes have been added, to be used in conjunction with a conventional site-specific code. These codes are:

- **MRI Post mortem**
- **CT Post mortem**

3.15 Procedures with a planning focus

For the October 2013 release, the CIMG have agreed the addition of scanning procedures for arthroplasty planning, on the basis that these scan protocols differ sufficiently from existing diagnostic-focused content, requiring limited sequences of hip/knee/ankle scanning in order to create custom machined cutting jigs ahead of the surgery itself. The new additions are:

- **MRI Arthroplasty planning lower limb**
- **CT Arthroplasty planning lower limb**

3.16 Additional style guidance

There are number of aspects which can aid consistency and clarity in the construction of term strings. These are described in the following section.

3.16.1 Term length

Due to the 40 character term length limit, many words are used both in their full form and in an abbreviated form depending on the length of the other words in the description. However, where the maximum term length is not compromised abbreviations should not normally be used. The exception to this rule is where a commonly used modality abbreviation exists. Examples of such exceptions are: MRI, CT, MRA, US, XR.

3.16.2 Plurality

In general procedures are described as the singular in terms of body site. Body sites are only expressed as plural when describing it and its sub-types, rather than to refer to paired structures (which should be described in the singular). The following are both acceptable representations:

- **CT Salivary glands** (means more than one type of salivary gland)
- **CT Parotid gland** (means one or both)

3.16.3 Prepositions and conjunctions

Although the word 'of' was considered of utility in making descriptions readable in the SNOMED subset, in the interim representation, due to the character length constraints it is desirable to eliminate this.

The special characters such as “/”, “+” and “&” have previously been used as a logical “and”. Following the consultation and approval from CIMG, these special characters were removed from all descriptions to reduce local maintenance and to avoid potential safety and interoperability issues. The word 'and' is used where the meaning of a description is altered by the removal of those special characters.

3.16.4 Exclusions and catch-all categories

There should be no exclusion categories (e.g. x excluding particular sub-types of x) and no use of the word 'other' (e.g. other fluoroscopy of chest) as these would not describe actual instances of procedures.

3.16.5 Punctuation (parentheses, colons, full-stops, commas etc)

It has been agreed that there is no requirement for the use of parentheses. Neither should hyphens, colons, semi colons, commas and full stops be used in any description. All descriptions will only use letters (a-z, A-Z) and numbers (0-9).

3.16.6 Capitalisation

The first letter of the term string will always be capitalised. All acronyms will be entirely capitalised.

The first letter of any other abbreviation will be capitalised.

The first letter of the laterality is also capitalised.

The first letter of the second word will be capitalised if the first word is fully capitalised.

No other capitalisation is permitted.

3.16.7 Suffices

One of the most common areas of flexibility in the practice of diagnostic imaging is the variable use of the suffices ‘...ography’ and ‘...ogram’. It was agreed that, for the NICIP code set, the chosen representation would be ‘ography’ and the ‘ogram’ would be perfectly acceptable as the synonym, for example:

- **Cystourethrography (preferred term)**
- **Cystourethrogram (synonym)**

3.16.8 Combined procedures

3.16.8.1 Combined site procedures

It is often difficult to determine whether a single procedure is being performed on more than one site or whether it really comprises multiple procedures. As a general rule, we would expect a procedure on a single site to be the consistent, uniform style adopted however it is recognised that a small number of procedures on proximate sites are fairly universally considered to be a single examination. There are therefore a small number of combined site procedures represented as follows:

- **CT Neck thorax abdomen pelvis**
- **MRI Liver spleen**

However, the following are not allowed because they can be recorded as separate procedures or are within a single region of the body:

- CT thorax and liver
- CT pulmonary angiography and venography
- XR Chest and Ribs
- XR Chest and Sternum

3.16.8.2 Combined modality procedures

It is important to consider which modality is the dominant one, so that term and code composition is logical. There are also imaging techniques which are sometimes considered as modalities. The following are agreed examples of multi-modality/technique procedures:

- **US Doppler carotid artery**
- **NM Parathyroid scan SPECT**

In the case of modalities combined with fluoroscopy, the principle to be adopted is that the examination should be described by its dominant modality. This would reduce the requirement to include many "combined" procedures.

The NICIP code set should contain versions of each examination by modality, e.g. in the case of nephrostomy tube insertion we should have all of the following:

- **US Guided nephrostomy**
- **CT Nephrostomy**
- **Nephrostomy** (which implies fluoroscopic imaging)

Only the dominant modality should be coded, therefore a nephrostomy tube insertion performed using ultrasound and fluoroscopy would take the form of:

- **US Guided nephrostomy**

Similarly, an insertion of a biliary stent, endoscopically, and with fluoroscopic guidance, would take the form:

- **ERCPinsertion biliary stent**

3.17 Acronyms and abbreviations in the NICIP code set

Due to the difficulty in fully articulating complex procedures using no more than 40 characters, many words have to be abbreviated.

Depending on character availability the same word might have more than one abbreviation. However, the same abbreviation must not be used for more than one word (each abbreviation must be unique).

Where substances are required in the description and they are required to be abbreviated, the representation should be in the form of the International chemical symbol, e.g. Se for Selenium.

The approved abbreviations for the latest release of the NICIP code set can be found in appendix A – this will be updated with each subsequent release as new abbreviations are required.

4 Proposed technical representation

4.1 SNOMED CT

SNOMED CT is a clinical terminology with interface and reference properties. Interface properties are those features of the terminology that focus on data collection at the user interface as opposed to reference properties which focus on data retrieval, aggregation and analysis.

4.2 Basic Elements of SNOMED CT

- Concepts – are the basic units of SNOMED CT. SNOMED CT is organised into hierarchies of concepts.

- Descriptions – are terms that are assigned to concepts. Descriptions describe or express the meaning of the SNOMED CT concept.
- Hierarchies – Concepts are organised into twenty SNOMED CT hierarchies (including UK admin hierarchy). Each hierarchy has sub-hierarchies within it.
- Attributes – are properties or characteristics of concepts. Attributes are used to characterise and define concepts.
- Relationships – are the connections between concepts in SNOMED CT.

All concepts in SNOMED CT have formal definitions which are an explicit representation of the concept's meaning with respect to the concept model. A concept's definition consist of its relationships to other concepts through the 'is a' relationship and its attribute relationships. These are known as the defining characteristics of SNOMED CT and they allow the concept to be differentiated from all others.

For example:

Elbow X-ray

IS-A	procedure on elbow
IS-A	skeletal X-ray of upper limb
Has-Method	radiographic imaging
Has-Procedure site	elbow region structure

Formal concept definitions are one of the reference properties that allow concepts to be processed by a computer.

Concept descriptions are the terms, or labels that are assigned to specific SNOMED CT concepts. For example:

- Concept ID: 68306006
- Fully specified name: **diagnostic radiography of facial bones (procedure)**
- Preferred term: diagnostic radiography of facial bones
- Synonym: facial bones X-ray
- Synonym: radiography of facial bones
- Synonym: X-ray of facial bones

Alternative descriptions are an important interface property because they give end users the flexibility to use terms that they are familiar with.

The fully specified name is a phrase that describes a concept uniquely and in a manner that is unambiguous. Therefore a DI procedure's fully specified name should reflect an unambiguous descriptor which includes the modality and body site, for example fluoroscopy of abdomen (procedure).

The preferred term is a term that is deemed to be most clinically appropriate way of expressing a concept in a clinical record currently. The preferred term can be changed to reflect changes within clinical practice over time.

Synonymous terms are used to provide acceptable alternatives to the preferred term in order to express a concept in different ways.

4.3 Constraints preventing use of SNOMED CT subset and concepts

The proposed PACS list is abbreviated to fit within 40 character term length constraints imposed by some PACS and RIS systems.

SNOMED CT has a 255 character maximum term length.

The proposed PACS list includes some terms that are interpreted in a particular way because of the scope in which they are used. Thus the scope makes it evident that the term refers to a radiological process even when the term may not specifically state that.

In a few cases a similar term might be interpreted differently outside that scope (i.e. within a more general clinical terminology such as SNOMED CT).

The proposed PACS list includes terms that include laterality as a "pre-coordinated" part of the term.

SNOMED CT also includes some procedure concepts with pre-coordinated laterality but the general view is that in future post-coordination should be the preferred way of expressing laterality. Where pre-coordinated concepts exist, logical modelling requires them to be defined by relationships to the appropriate lateralised procedure site.

SNOMED CT is not an unstructured container into which any number of terms can be added without regard for the underlying model. A valuable design feature of SNOMED CT is that where concepts are well-modelled the equivalence of alternative ways of saying the same thing can be computed. This is undermined if new terms are added without addressing the logical relationships between associated concepts.

4.4 SNOMED CT for the NICIP code set

4.4.1 Imaging procedure modelling

The SNOMED CT concept model has in the order of fifteen potential attributes available for defining procedure type concepts. For editorial principles please refer to the SNOMED International SNOMED CT Editorial Guide, available from the SNOMED International please visit <https://confluence.ihtsdotools.org/display/DOC/>

4.4.2 Mapping and description of concepts

All terms in the NICIP code set are now mapped to a concept in SNOMED CT. A new concept will be added in SNOMED CT if there is no equivalent SNOMED CT concept for a term in the NICIP code set. The mapping table and SNOMED CT subset for PACS are part of interim solution.

Incorporation in SNOMED CT should adhere to the following guidelines:

- The set of nationally agreed NICIP term should be divided into two sets.
 - NICIP Specific Terms – terms that are abbreviated or phrased in ways that have specific use in systems utilising the NICIP code set and might be misunderstood outside that scope.
 - Example "Cardiac valvuloplasty" (which in NICIP terms refers to the radiographic procedure related to valvuloplasty rather than the general concept of valve repair).
 - General terms also used in NICIP – terms that are used in systems utilising the NICIP code set but which are not abbreviated and which would have the same meaning outside the scope of NICIP.
 - Example "X-ray of chest"
- The mapping between the NICIP code set and SNOMED CT is based on meaning of concept instead of term, for example:

The NICIP term "Cardiac valvuloplasty" should not be added as a description of the existing SNOMED CT concept "Cardiac valvuloplasty". The NICIP term refers to a fluoroscopic procedure undertaken to support the associated procedure "cardiac valvuloplasty". However the existing SNOMED CT concept "cardiac valvuloplasty" does not imply the use of a radiographic technique and is not defined as if it did.

- Mapping to general SNOMED CT concept

All terms in NICIP code set are now mapped to an equivalent concept in SNOMED CT. Along with the development of SNOMED CT, the mappings to general SNOMED CT concepts have been deprecated. The mappings to specific new concepts in UK extension or international core should be active in interim table. The records of old mappings will remain in interim table for audit, report, and data analysis.

- Representation of descriptions for all terms including general and specific NICIP terms

Representation will follow the SNOMED CT guideline, e.g. abbreviations, acronyms and truncations should not appear in Fully Specified Name (FSN), descriptions should be explicitly expressed, for example:

- "Cardiac valvuloplasty" should have "fluoroscopy examination of the heart for cardiac valvuloplasty (procedure)" as FSN.
 - NICIP specific terms should be added to description with status of DescriptionType=0 (unspecified) and language code "en."
 - The intended effect is that these terms will not be treated as preferred terms or synonyms in a general search or in a general display of synonyms.
- General terms used in NICIP should be used for preferred terms or synonyms where they comply with SNOMED CT guideline, for example

The NICIP term "XR chest" should be added as a description of "X-ray of chest" because the meaning of "XR chest" in the scope of a system utilising the NICIP code set is "X-ray of chest".

4.4.7 Practical examples

4.4.7.1 NICIP description exact match with current SNOMED concept

Interim term "Barium small bowel enema" has an exact equivalent of 'Barium small bowel enema' 241162004

4.4.7.2 NICIP description suitable for inclusion in core as new concept

New concept with FSN of "CT of coccyx (procedure)" needs to be added to SNOMED CT as a sub-type of 241577003 "CT of Spine"

4.4.7.3 NICIP description is a suitable synonym for an existing SNOMED concept

"CT Angiogram Aorta" could be added as a synonym of 419462002 "CT angiography of aorta"

4.4.7.4 NICIP description is equivalent to existing SNOMED concept but would not be acceptable as synonym

Interim description = CT radiotherapy planning scan

This is equivalent to "CT guidance for treatment planning, teletherapy" 24689001 in SNOMED CT

The NICIP description would be associated with the existing concept as a descriptiontype=0 (unspecified)

4.4.7.5 NICIP description would be equivalent to a suitable new SNOMED concept but would not be acceptable as synonym

Interim description = CT Radiotherapy planning scan bladder

A new concept would need to be created = CT scan for planning of radiotherapy to bladder

The appropriate super-type would be "CT guidance for treatment planning, teletherapy" 24689001

4.4.7.6 NICIP description is not suitable for addition to SNOMED and is not equivalent to any existing SNOMED concept (because of ambiguity)

A suitable FSN will have to be determined which effectively represents the concept. The appropriate super-types should be assigned.

The interim description should be associated with this new concept with a descriptiontype=0 (unspecified).

Due to the constraints under which the NICIP descriptions have been developed, most of them will be represented this way in SNOMED.

For example:

NICIP description = Inferior vena cava filter removal

A precise fully specified name = Fluoroscopic guidance and removal of inferior vena cava filter (procedure)

This would need to be created (initially in the UK extension) and assigned appropriate super-types, in this case = Removal of inferior vena caval filter 233439000 and Fluoroscopic angiography 420040002

This new concept would also inherit the defining attributes (it is not necessary at this time to assign additional definitions) but the concept would remain 'primitive'.

The NICIP descriptor would be associated with this concept exactly as Inferior vena cava filter removal with descriptiontype=0

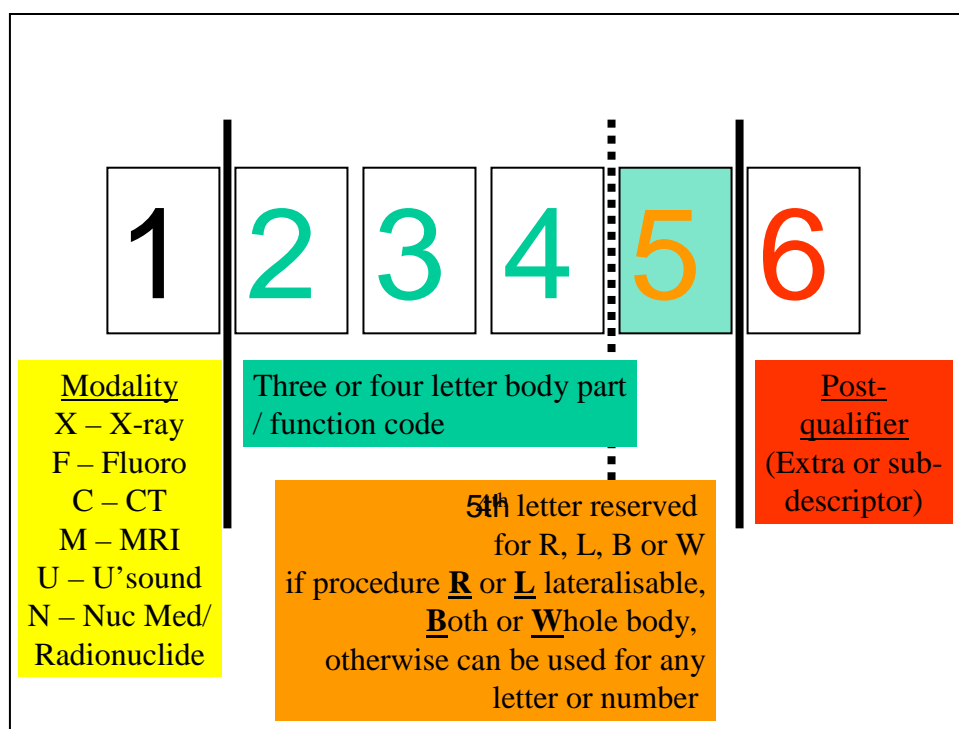
NB: There are a number of concepts which could be considered as imaging to support an interventional procedure or as a contemporaneous set of procedures. The above example has been described as if the latter situation were true, if the former were true, the FSN might = Fluoroscopic guidance for removal of inferior vena cava filter and the only appropriate super-type would be fluoroscopic angiography. Advice will be sought from the expert reference group for all of this type of description.

If both variants should be captured then both should have new concepts added to SNOMED (as described above) with the NICIP description being associated with both new concepts.

4.5 Legacy (meaningful) codes

In the short to medium term, the 5 or 6 character meaningful codes used to uniquely identify the procedure will continue to be maintained. These codes are used in current systems to aid user interface functionality. It is undesirable to change codes unnecessarily as this can effect implementations adversely.

Where a description from an earlier version has been changed in a minor fashion to conform to more rigorous editorial principles, then it is not necessary to change the code too. These codes are unique and are constructed to a formula developed by the Royal College of Radiologists:



Modality codes are as follows:

- C CT, including CT IR procedures, virtual CT procedures and CTA
- E Endoscopic procedure, where the endoscopy is the PRIME modality even if radiologically assisted
- F Fluoroscopic diagnostic tests, including diagnostic angiograph
- I Interventional Radiological procedures performed using fluoroscopy
- K Cone Beam CT
- M MRI/MRA/MRV procedures
- N NM or RNI diagnostic imaging procedures
- U Ultrasound, including Obstetric U/U and US IR procedures
- X Plain film imaging procedures including mammography (x ray)
- Y physics or
- O Clinical/Ocular Photography

Prohibited Characters in Modality Codes:

Due to the potential for duplication with other code sets, it has been agreed that the letters L and S will never be used as the first character of a NICIP short code. Similarly, the implementation guidance indicates that where there is a requirement for a local code to be utilised, the short code must in all cases begin with the letter Z. The letter Z will therefore never be used as the first character of a NICIP short code.

Short Code Convention – Non Conformant Codes:

It is acknowledged that there are a small number of released NICIP short codes that do not conform to the short code convention for identifying laterality. This issue was raised at the CIMG meeting in May 2012. It was agreed that these codes can continue to be released as agreed exceptions and the codes are listed in Appendix B.

The optional sixth character field has been populated with some of the following codes:

A	Ablation
B	Biopsy
C	Contrast use (where the use of contrast is not implicit in the nature of the examination. e.g., not used for angiography examinations but is used for CT Head with contrast)
D	Drainage
E	Embolisation
G	exchanGe of device, e.g. Cardiac defibrillator change, dialysis catheter exchange
I	Insertion of device
J	inJection –as an objective of the procedure, not as part of the preliminary to this objective
L	Lithotripsy
M	Mobile for any modality, but particularly for 'portable' plain films and use of mobile image intensifiers
N	aspiration
O	tOmography in its wider sense.
P	'Plasty - as in angioPlasty or dacrocystoPlasty – i.e. balloon dilatation
Q	obliQue
R	for Radiotherapy planning
S	Stent
T	Use of intraThecal contrast
X	eXtraction - e.g. in retrieval of intravascular foreign bodies or removal of temporary IVC filter
Y	Other

Additional Characters as used in dental representations are as follows:

X	X Ray
D	Dental
P	Periapical
A	Up to 5 teeth
B	Between 6 and 10 teeth
C	more than 10 teeth
F	Full mouth

O	Occlusal
U	Upper
L	Lower
(D)PT	Panoramic radiograph
LCP	Lateral Cephalogram
PCP	PA Cephalogram
OL	Oblique lateral

5 Distribution

From October 2009, the NICIP codes, with or without SNOMED CT mappings, will only be available from the Technology Reference data Update Distribution (TRUD) service. The NICIP code set can be obtained electronically by registering via the TRUD link at the [NICIP homepage](#).

All versions of the NICIP code set are available from this source, along with the supporting documentation required to assist with safe implementation. In circumstances where customers are unable to access the TRUD service due to licensing restrictions, please contact the Information Standards Service Desk for further advice (information.standards@nhs.net or call 0300 30 34 777). Updates of the NICIP code set are aligned with the defined national release cycle which is currently 1st April and 1st October each year. Changes have been made to this products release schedule for 2019 only. More information can be found on [Delen](#).

Accompanying documentation for the NICIP code set is also available at the [NICIP homepage](#).

6 Requests for change

Clinicians and system managers working with the PACS and RIS systems can make requests for additions to the NICIP code set. All requests must first be checked for conformance to the NICIP editorial principles.

Requests for changes to the NICIP code set should be made via the NHS Digital UK National Release Centre (NRC) Request Submission Portal at <https://isd.hscic.gov.uk/rsp/>, with a definition and rationale of why the submission is required.

Where a new submission is found to exist albeit represented slightly differently, it is acceptable to add the new submission as a synonym. In each release some NICIP descriptions or associated data may be modified as the code set regularly undergoes quality assurance review processes. The changes, such as spelling variations, capitalisation, are considered as minor changes. The NICIP codes associated with these changes are not replaced by new codes as there has been no change to the meaning of the code. Requests for change will be assessed against the editorial principles and either added to the list, declined or referred to the CIMG for consideration.

All submissions will be dealt with in due course but there is no guarantee that any new item will be added in time for a particular release.

6.1 Body part multiplication factor

6.1.1 Mapping codes to Korner codes

As per notification in April 2010, Korner bands have been removed and will no longer be maintained or distributed with any future releases. This change to the NICIP code set has been approved by the Information Standard Board and details of the amendment to the standard can be found at: <http://www.isb.nhs.uk/library/release/456>.

6.1.2 Mapping for KH12 returns and body part multiplication factor

Clinical Imaging departments are required to submit KH12 returns to the Department of Health and Social Care. To facilitate automation of this process, each procedure in the NICIP representation, where appropriate, has been given a suggested map to the relevant KH12 modality grouping and body part multiplication factor for KH12 returns. Any identified inconsistencies, queries or requests for change to the mapping should be submitted via the NHS Digital UK National Release Centre (NRC) Request Submission Portal at <https://isd.hscic.gov.uk/rsp/>

It is important to note that this mapping is indicative only and has not been formally validated, therefore please exercise caution in use.

6.2 Interventional flag

It is also necessary in KH12 mandatory returns to indicate whether a particular examination was interventional in nature. The NICIP code set includes a flag to indicate whether each examination was indeed considered interventional or not. Where there is a diagnostic element and an interventional element, the procedure is flagged as interventional. This is the optimal way to distinguish between interventional and non-interventional procedures. Although short codes should now conform to the first character convention around “I” for fluoroscopy guided interventional procedures there are a small number of released non conformant codes. Also interventional procedures under other imaging modalities do not use the first letter “I” convention. Therefore short codes cannot be reliably used to identify interventional procedures.

The definition adopted is that used by the Royal College of Radiologists and the British Society of Interventional Radiology: that a technique is interventional if it effects treatment.

7 Mapping to OPCS-4

To support current and future data collection in all imaging departments, a mapping to the latest version of OPCS-4 will need to be maintained. As new content from the NICIP code set is added to SNOMED CT, a map to OPCS-4 will routinely be assigned as part of the process.

The first release of this table was in October 2009. It is highly recommended that the mapping table is subjected to local validation and assessment processes prior to use,

although it has been reviewed by clinical imaging and coding experts. Feedback from any local validation/test use is welcome and can be submitted via the Information Standards Service Desk at information.standards@nhs.net.

NHS Digital, as the UK National Release Centre (UK NRC) for SNOMED CT, has consulted with stakeholders and compiled the evidence that the NICIP codes to OPCS-4 mapping table is being used in the production of data to inform the National Tariff Payment System data in the field of Clinical Imaging. Whilst the relevant governance bodies have approved the transition of the mapping table to supported product in principle, NHS Digital have identified some necessary improvements to the product development environment such that the stable production has the potential to be compromised. Once these tooling enhancements are in place the status will be formally updated to supported product. The consultation and subsequent investigations have led the CIMG to conclude that, rather than introduce more complex rules into the mapping table, the process should not be fully automated, and that imaging professionals should work closely with the clinical coding departments to ensure that the correct OPCS-4 codes are assigned according to coding national standards and local protocols.

The report of the findings following the consultation on the utility of the mapping table from The National Interim Clinical Imaging Procedure (NICIP) codes to OPCS-4 is now available on the [consultation website](#).

The mapping table is part of the national release of the NICIP code set. It is only available from the Technology Reference data Update Distribution (TRUD) service and can be obtained electronically by registering on line via the TRUD link at the [NICIP homepage](#).

8 Mapping to SNOMED CT

To support eventual migration from the NICIP code set to SNOMED CT, a mapping from each entry to a corresponding SNOMED CT concept has been developed. All NICIP codes now map directly to an equivalent concept within SNOMED CT. With the exception of OPCS-4, no support will be provided for mapping from the NICIP code set to other code systems (including Read codes). The release dates for the updated products (NICIP code set and SNOMED CT) have now been synchronised to facilitate the process of mapping.

It should be noted that where items in the NICIP code set terms include laterality, this additional information has not historically been directly incorporated in pre-coordinated SNOMED CT. The release table has additional fields equivalent to the post-coordinated representation which must be used to fully describe the procedure within SNOMED CT. However, a SNOMED CT editorial policy change has resulted in the addition of pre-coordinated lateralised procedure codes and so it is anticipated that over the next several releases all lateralised NICIP codes will be remapped and have a one-to-one lateralised SNOMED procedure code.

For further information please refer to the SNOMED International SNOMED CT Technical Implementation Guide:

<https://confluence.ihtsdotools.org/display/DOC>

E.g.:

CANKL, CT Ankle Lt maps to 241575006 CT of ankle, **plus** 272741003 Laterality =

7771000 Left

The structure of the imaging procedure concepts in SNOMED CT is rather more complex than in the NICIP code set with additional properties needing to be defined in order to conform to the concept model and term construction rules.

Also, some of the constraints of the systems the NICIP descriptions were developed for are not restrictive to the same degree in SNOMED CT. SNOMED International guidance requires all abbreviated terms to be fully expanded within SNOMED CT. It has been agreed that the representation will be the abbreviation followed by the fully expanded term in brackets. This will aid searches using abbreviating terms.

Example: CT (computed tomography) of abdomen.

The key differences between the NICIP code set representation and SNOMED CT are illustrated in the following table:

<u>Interim representation</u>	<u>SNOMED CT</u>
40 character description limit	255 character description limit
Synonyms permitted	Synonyms permitted
6 character alphabetic codes	12-18 character numeric codes
Fully enumerated	Possible to further qualify concepts (e.g. 'urgency')
Laterality explicitly included (3 variants – left, right, both)	Laterality post-coordinated
Many aspects 'implied' (see editorial principles)	Implied meaning not permitted
Flat list	Hierarchical relationships
Modality defined by first character of code	Modality defined by 'method' attribute
Abbreviations allowed from an agreed list of abbreviations, acronyms, truncations.	Abbreviations not permitted. All acronyms or abbreviations must be fully expanded.
Limited history mechanism, concepts never removed	Full component history, concepts never removed

9 Appendix A – Abbreviations and acronyms in the NICIP code set

EXPANDED NOTATION	ABBREVIATION
Abdomen/Abdominal	Abdo
Abdomen X-ray	AXR
Ablation	Abl
Absorption	Abs
Albumin	Album
Ambulatory	Amb
Ammonia	NH3
Aneurysm	Aneur
Angiotensin converting enzyme	ACE
Angiogram	Angio
Antegrade	Anteg
Anteroposterior	AP
Anti-1-amino-3-18F-fluorocyclobutane-1-carboxylic acid	18F FACBC
Aorto-uni-iliac	AUI
Application	Appl
Arterial spin labelling	ASL
Arterio-venous fistula	AVF
Arterio-venous malformation	AVM
Artery	A
Arthrogram	Arthro
Aspiration	Asp
Assessment	Assess
Assisted	Ass
Attenuation correction	Atten Correct
Balloon	Balln
Barium	Ba
Bifurcated	Bifurc
Bioabsorbable	Bioabs
Biodegradable	Biodegr

Biopsy	Bx
Bone mineral densitometry	BMD
Both	B
Carbon 11	C11
Carbon 13	C13
Carbon dioxide	CO2
Carcino-Embryonic Antigen	CEA
Carcinoma	Ca
Cardiac	Card
Cardiac sarcoidosis	CS
Catheter	Cath
Central venous catheter	CVC
Cerebral	Cerebra
Cerebrospinal fluid	CSF
Cervical	C
Chemical shift imaging	CSI
Chemotherapy	Chemo
Chest X-ray	CXR
Cholangiogram	Cholangio
Chronic total occlusion	CTO
Chromium 51	Cr 51
Clinical photography	Clinphoto
Computed tomography	CT
Collateral	Coll
Congenital	Congen
Contrast	Cont
Contrast-enhanced ultrasound	CEUS
Common carotid artery	CCA
Common femoral artery	CFA
Common femoral vein	CFV
Common iliac artery	CIA
Conversion	Conv
Coronary	Cor

Coronary CT angiography	CCTA
Cutting	Cutt
Decompression	Decomp dcmp
Deep inferior epigastric perforator	DIEP
Defibrillation	Defib
Device	Dv
Diagnostic	Dx
Dynamic infusion cavernosometry and cavernosography	DICC
Digital subtraction angiography	DSA
Dilatation	Dilat
Dimercaptosuccinic acid	DMSA
Dilatation	Dilat
3,3-diphosphono-1,2-propanodicarboxylic acid	DPD
Dopamine Active Transporter	DAT
Drug eluting stent	DES
Dual energy computed tomography	DECT
Dual energy X-ray photon absorptiometry	DXA
Dual energy X-ray photon absorptiometry	DEXA
Dural Arterio Venous Fistula	DAVF
Echocardiography	Echocard
Electrocardiography	ECG
Electrophysiology study	EPS
Embolisation	Emb
Embolization	Emboli
Endoscopic	Endo
Endoscopic retrograde cholangiopancreatogram	ERCP
Endoscopic ultrasound	EUS
Endovascular aneurysm repair	EVAR
Electrophysiology study	EP Study
Equilibrium	Equil
Ethylenediamine tetra-acetate	EDTA
Ethylenediamine tetramethylene phosphonic acid	EDTMP

Excision	Exc
Exercise	Ex
External	Ext
Extracorporeal membrane oxygenation	ECMO
Extracorporeal shock wave lithotripsy	ESWL
Fenestrated	Fen
Femoral	Fem
Fibula	Fib
Fine needle aspiration	FNA
Fistula	Fist
Fluorodeoxyglucose	FDG
Fluoromisonidazole	FMISO
Fluorothymidine	FLT
Fluorine	F
Fluoroscopic	Fluoro
Focused intensive care echocardiography	FICE
Foreign body	FB
Four dimensional	4D
Fragment antigen binding	FAB
Function	Func
Gadolinium 67	Gd67
Gadolinium 68	Gd68
Gallium	Ga
Gastro-intestinal	GI
Glomerular filtration rate	GFR
Guided	Guid
Gynaecological	Gynae
Hexamethylpropyleneamine oxime	HMPAO
Hepatobiliary iminodiacetic acid scan	HIDA scan
High intensity focused ultrasound	HIFU
Hour	Hr
Human Immunoglobulin	HIG
Hydrazinonicotinamide	HYNIC

Hydrazinonicotinamide-Tyr3-octreotide	HYNIC-TOC
Hydroxyethylidene diphosphonate	HEDP
Hysterosalpingogram	HSG
Implant	Imp
Implantable Cardioverter Defibrillator	ICD
Indium	In
Inferior mesenteric artery	IMA
Indium 111	In111
Inferior vena cava	IVC
Injection	Inj Inject
Insertion	Insert
Internal	Int
Internal auditory meatii	IAM
Interphalangeal	IP
Intra aortic balloon pump	IABP
Intradiscal electrothermal annuloplasty	IDET
Intra-operative	Intra-op
Intra-uterine contraceptive device	IUCD
Intravascular ultrasound	IVUS
Intravenous	IV
Intravenous urogram	IVU
Iodine 123	I123
Iodine 125	I125
Iodine 131	I131
Iodobenzamide	IBZM
Irreversible electroporation	IRE
Isolated limb perfusion	ILP
Intrasaccular	IS
Joint	Jt
Kidney Ureter Bladder	KUB
Laser assisted decompression of intervertebral disc	LADD
Left	Lt

Left atrial	LA
Left ventricle	LV
Liquid Polymer	LP
Localisation	Loc
Lower limb	LL
Lumbar	L
Lutetium 177	Lu177
Macroaggregated	Macroaggregat
Macroaggregated albumin	MAA
Magnetic resonance angiography	MRA
Magnetic resonance cholangiopancreatogram	MRCP
Magnetic resonance	MR
Magnetic resonance imaging	MRI
Magnetic resonance venogram	MRV
Major systemic to pulmonary collateral artery	MAPCA
Malformation	Malf
Mammogram	Mammo
Maximum intensity projection	MIP
Mechanical	Mech
Medial	Med
Medical photography	Medphoto
Medical photography	MP
Metacarpophalangeal	MCP
Meta-iodobenzylguanidine	MIBG
Metallic	Met
Metatarsophalangeal	MTP
Methoxyisobutylisonitrile	MIBI
Micturating cystourethrogram	MCUG
Mobile image intensifier	MII
Morphology	Morph
Multi-disciplinary team	MDT
Multiple gated acquisition	MUGA
Myocardial perfusion scintigraphy	MPS

Nasogastric	NG
Nasojejunal	NJ
Needle	Ndl
Nitrogen 13	N13
Non-accidental injury	NAI
Nuclear Medicine	NM
Oblique	Obliq
Obstetric	Obs
Occlusion	Occl
Oesophageal	Oesoph
Operative	Op
Optical coherence tomography	OCT
Orthopantomogram	OPG
Pancreas	Panc
Patent ductus arteriosus	PDA
Percutaneous	PC / Pc
Percutaneous cardiac intervention / Percutaneous coronary intervention	PCI
Percutaneous endoscopic gastrostomy	PEG
Percutaneous Transhepatic Cholangiogram	PTC
Percutaneous Transluminal	PTL
Percutaneous transluminal angioplasty	PTA
Percutaneous transluminal coronary angioplasty	PTCA
Peripherally	Periph
Peripherally inserted central catheter	PICC
Permanent Pacemaker	PPM
Per-oral image-guided gastrostomy	PIG
Phosphorus 32	P32
Planning	Plan
PoC	Point of Care
Portosystemic shunt	PSS
Positron emission tomography	PET
Posterior	Post

Posteroanterior	PA
Post Nasal Space	PNS
Profunda femoris artery	PFA
Prostate arterial embolisation	PAE
Prostate specific membrane antigen	PSMA
Pulmonary	Pul
Quality assurance	QA
Radioactive seed localisation	RSL
Radiofrequency	RF
Radioimmunoguided surgery	RIGS
Radiologically inserted gastrostomy	RIG
Radionuclide cardiac ventriculography	RNCV
Retrograde	Retrog
Rhenium 186	Rh186
Reconstruction	Recon
Red blood cell	RBC
Redistribution	Redist
Removal	Remov
Replacement	Repl
Resistance	Resist
Resolution	Res
Resynchronisation	Resynch
Revision	Rev
Rhenium 186	Re186
Right	Rt
Right Ventricular	RV
Rubidium 81	Rb81
Rubidium 82	Rb82
Sacral	S
Sacro-iliac	SI
Sacro-iliac joint	SIJ
Sacro-iliac joints	SIJ's
Saphenous	Saph

Saturations	Sats
Scintimammography	Scintimammo
Selenium	Se
Single photon emission computed tomography	SPECT
Skull X-ray	SXR
Small	Sm
Sphincter	Sphinc
Sodium fluoride	NaF
Soluble	Sol
Stent graft	SG
Stereotactic	Stereo
Stereotactic multiple arc radiation therapy	SMART
Stimulation	Stim
Strontium 89	Sr89
Subtraction	Subt
Superficial femoral artery	SFA
Superficial femoral vein	SFV
Superior mesenteric artery	SMA
Superior vena cava	SVC
Superparamagnetic	SPM
Superparamagnetic Iron Oxide	SPIO
Tapered	Taper
Technetium	Tc
Technetium 99m	Tc99m
Temporomandibular joint	TMJ
Temporomandibular joints	TMJ's
Temporary	Temp
1,4,7,10-tetraazacyclododecane-1,4,7,10-tetraacetic acid Tyr3-octreotate	DOTATATE
Tetrofosmin	Tf
Thallium	TI
Thoracic	T
Three dimension	3D

Thrombectomy	Thrombect
Thrombolysis	Thromb
Tibia	Tib
Tomogram	Tomo
Trans-abdominal	TA
Transcatheter aortic valve implantation	TAVI
Transcatheter mitral valve implantation	TMVI
Transplanted	Transp
Transjugular intrahepatic portosystemic shunt	TIPS
Transjugular intrahepatic portosystemic shunt	TIPSS
Transjugular liver biopsy	TJLB
Transjugular renal biopsy	TJRB
Trans-oesophageal echocardiogram	TOE
Transplant	Transp
Transrectal ultrasound	TRUS
Trans-thoracic echocardiogram	TTE
Trans-vaginal	TV
Ultrasound	US
Upper Limb	UL
Vacuum	Vac
Vagus nerve stimulation	VNS
Vascular	Vasc
Vein	V
Ventilation and perfusion	V/Q
	VQ
Ventilation and perfusion	V/P
Ventricular tachycardia	VT
Vertebral	Vert
WADA (as in Dr. Juhn Wada)	Wada
Whole body	WB
X-ray	XR
Yttrium 90	Y90

10 Appendix B – Laterality convention non-conformant short codes

CAAMBC	CT IAM with air contrast
ICAABP	Pc balloon test Occl carotid artery
IVEABP	Pc balloon test Occl vertebral artery
IMCABP	Pc balloon test Occl middle cerebral A
IACABP	Pc balloon test Occl anterior cerebral A
MRTOBR	MRI Radiotherapy planning scan orbits
IOTABS	Op branched tube SG thoracic aorta
IOAYBS	Op branched bifurcated SG abdo aorta
IOAUBS	Op branched AUI SG abdominal aorta
IAABBS	Pc branched tapered SG thoracic aorta
ITAOBS	Pc branched tube SG thoracic aorta
IAAYBS	Pc branched bifurcated SG Abdo aorta
IAAUBS	Pc branched AUI SG abdominal aorta
XCHAB	XR Chest and abdomen
XDBWB	XR Dental bitewing
XOPTBO	XR Orthopantomogram full
IBAABP	Pc balloon test Occl basiliic artery
CIAMBC	CT IAM with contrast
CIAMBT	CT IAM with intrathecal contrast
MCHIL	MRI Cardiac and hepatic iron load
IGSPLS	Pc stentgraft splenic artery
IVVTLP	Vertebroplasty lumbar
IKVTLP	Kyphoplasty lumbar
CVVTLP	CT Vertebroplasty lumbar
CKVTLP	CT Kyphoplasty lumbar
COOALA	CT Osteoid osteoma ablation laser
CLABLA	CT Guided ablation laser
ICSPLP	Pc cutting balloon splenic artery
IASPLS	Pc stent splenic artery
IDSPLS	Pc drug eluting stent splenic artery

IASPLE	Pc embolisation splenic artery
IVVALI	Pc Placement artificial venous valves
IPSPLP	PTA Splenic artery
MVPEL	MRV Pelvis
IASDRD	Fluoroscopic guided drainage
IFAARE	Embolisation facial artery
IPAVR	Percutaneous aortic valve replacement
IPPVR	Percutaneous pulmonary valve replacement
ICEARJ	Pc thrombolysis cerebral artery
ICEARX	Pc thrombectomy cerebral artery
ISPARJ	Pc thrombolysis spinal artery
FECERJ	Fluoro guided epidural Inj cervical
CECERJ	CT Guided epidural injection cervical
ICIIRB	Pc cutting balloon Int iliac artery B
IASFRS	Pc stent superficial femoral artery righ
FHEBRY	Pc hepatic arterial brachytherapy
NBRPR	NM I125 brachytherapy prostate
ICEARS	Pc stent insertion cerebral artery
NBPER1	NM Bone local peripheral single phase
NBPER2	NM Bone peripheral dual phase
EFOBR	Bronchoscopy
MFIBRA	MRI Guided ablation fibroid
NMPSRC	NM MPS Thallium stress and reinjection
IACORX	Transluminal atherectomy