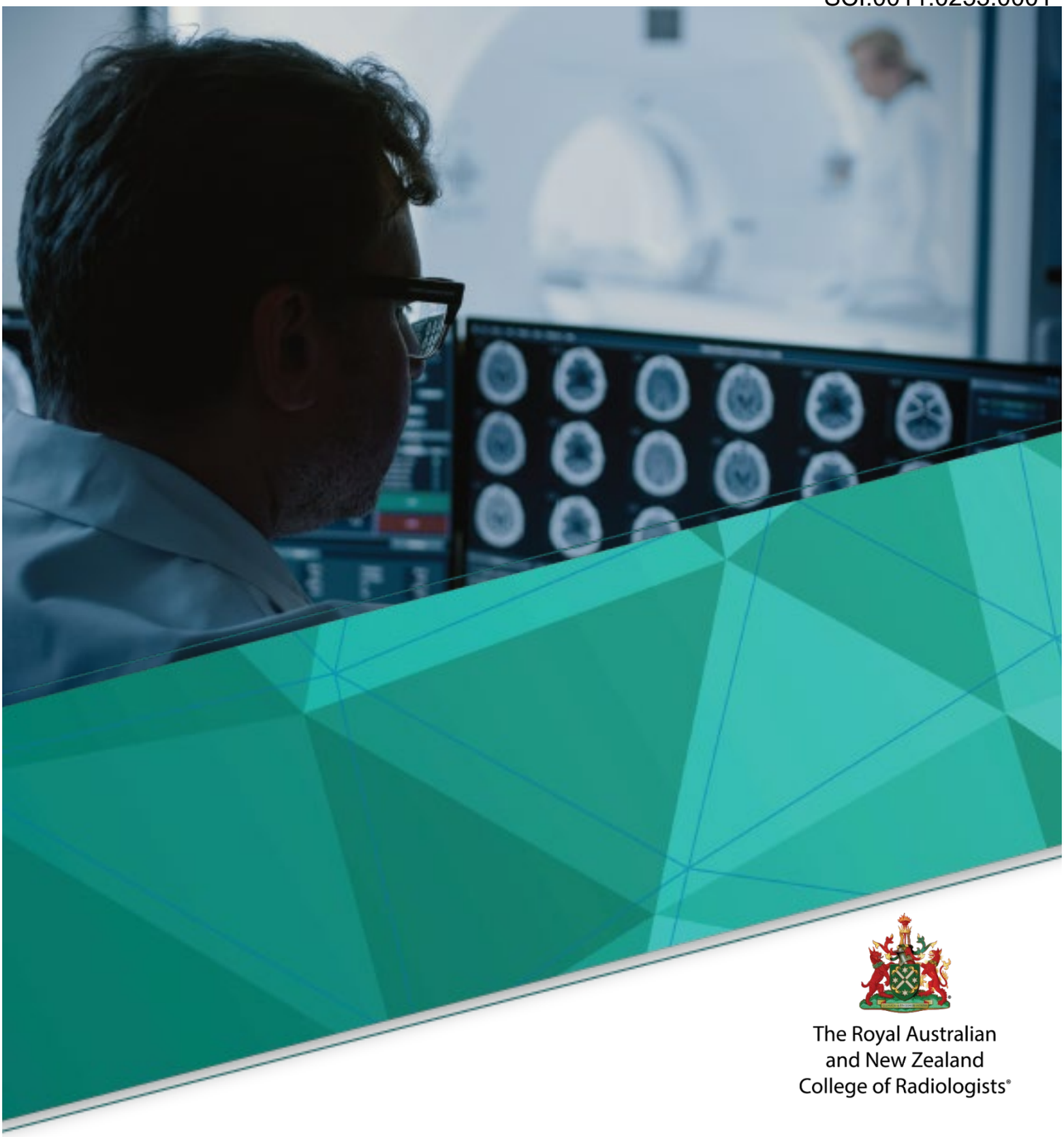

The Royal Australian and New Zealand College of Radiologists®

Clinical Radiology Learning Outcomes

RANZCR Clinical Radiology Learning Outcomes

January 2024 v1.3

Name of document and version:
Clinical Radiology Learning Outcomes, Version 1.3

Approved by:
Faculty of Clinical Radiology

Date of approval:
September 2021
September 2024

Revision Summary

Version	Date	Classification	Description
1.0	September 2021	Major	Initial Approval
1.1	January 2022	Minor	Item 2.2.64: Word “progression” replaced with “precession” Item 2.2.80: Text a duplicate of 2.2.79. replaced duplicate text with correct information.
1.2	January 2023	Minor	Updates made based on AITERP feedback.
1.3	January 2024	Minor	Item 1.7.3: Dot point added to explicitly describe the cause of health disparities as outlined in the MATEC Statement of Intent and Action Plan. Item 2.2.48: Word “over-beaming replaced with “over-ranging”

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Section Six

Section Seven

INTRODUCTION

The clinical radiology learning outcomes reflect the key competencies expected from RANZCR trainees at the end of their training journey. The learning outcomes are developed to support the learning and development of clinical radiologists and prepare them for future changes. The expectation is that at the end of training, clinical radiology trainees are capable of safe, independent practice in delivering quality patient care.

GRADUATE OUTCOMES

Communicate effectively with patients, navigating challenging communication scenarios.

Adjust communication to suit the level of understanding of patients and other health professionals, to convey expert opinion.

Share patient information in an effective manner, including in written and electronic formats, to optimise clinical decision making, patient safety, confidentiality and privacy.

Develop and maintain working relationships with other health professionals, engaging in respectful shared decision making and ensuring continuity of care.

Contribute to multidisciplinary team meetings, facilitating the discussion of investigative options and the results of imaging to guide the development of patient management plans.

Display leadership in local and wider healthcare systems, initiating and implementing quality improvements, and exhibiting responsible stewardship of healthcare resources.

Manage elements of professional practice, career development and personal life to balance wellbeing.

Advocate for individual patients, groups of people and the general community in relation to minimising risk, allocation of resources and service delivery for optimal patient outcomes.

Consistently demonstrate professional behaviour, in accordance with the RANZCR Code of Ethics, reflecting the values of the specialty and the medical profession.

Critically appraise scientific literature and adapt clinical practice according to the best available evidence.

Design and engage in research to address a clinical question and disseminate findings to contribute to the advancement of the specialty.

Apply a lifelong learning approach to professional development and participate in the education of students, peers, patients and other health professionals.

Promote cultural safety and tailor care according to patients' diverse needs, including religious and personal beliefs and values.

Advance the health of Aboriginal and Torres Strait Islander peoples and Maori and Pacific peoples by being aware of disparities in relation to incidence and diagnosis of conditions and actively support access to radiology services for communities and patients.

Demonstrate foundation knowledge of imaging technology, including the physical principles associated with image acquisition, quality and display of various imaging modalities, radiation protection and safety.

Identify anatomical structures on relevant imaging modalities and describe embryological development and normal anatomical variants of specific structures.

Demonstrate knowledge of general pathology as it relates to the identification of disease and conditions using imaging.

Determine the most appropriate imaging pathway to diagnose or exclude a range of medical conditions and accurately identify the condition on imaging studies across all relevant modalities.

Accurately interpret imaging studies of patients by conducting a quality assessment of images and synthesising relevant patient information from multiple sources.

Integrate a broader knowledge of clinical presentations, imaging appearances and pathology to form an appropriate diagnosis.

Formulate comprehensive reports on imaging studies which convey expert opinion, degree of certainty in the diagnosis, and its implications effectively.

Recommend additional imaging studies or procedures that may be necessary for diagnosis or management.

Recognise findings that constitute a medical emergency, or require urgent clinical priority for the patient or to reduce harm to others, and respond appropriately.

Perform diagnostic and therapeutic procedures under radiological guidance, demonstrating a thorough knowledge of risk assessment, informed consent processes, infection control and safe sedation.

Section One
INTRINSIC ROLES

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INTRINSIC ROLES

1.1 COMMUNICATOR

Establishing rapport with patients

1.1.1. Establish rapport with patients, engendering trust.

1.1.2. Communicate using a patient-centred approach, demonstrating empathy and compassion. Assist patients in managing anxiety, providing reassurance.

1.1.3. Demonstrate effective active listening skills, including asking open questions, using non-verbal communication to show engagement.

1.1.4. Use non-verbal communication effectively, such as when a patient is unable to speak during an examination or procedure.

1.1.5. Describe potential barriers to effective cross-cultural communication and utilise strategies to overcome them.

1.1.6. Recognise the need to use an interpreter, indigenous health worker or cultural support staff to facilitate communication with patients from culturally and linguistically diverse backgrounds, particularly in relation to obtaining informed consent.

Communication with patients

1.1.7. Obtain accurate and relevant information from patients to confirm information received from the referrer.

1.1.8. Elicit additional details when there appears to be a discrepancy with the request. Explain procedures to patients in a manner which facilitates understanding.

1.1.9. Recognise the impact of language, literacy and cultural considerations on the patient's participation in their care.

1.1.10. Be familiar with and utilise resources as appropriate to help patients and their families make informed decisions regarding their care.

1.1.11. Obtain valid informed consent by checking mutual understanding and encouraging questions to clarify any concerns.

1.1.12. Disclose adverse incidents or events to patients appropriately, according to local jurisdictional guidelines.

1.1.13. Manage challenging communication issues such as delivering bad news, confusion and misunderstanding.

Communication with colleagues

1.1.14. Adjust communication to suit the level of understanding of other medical specialists and health professionals.

1.1.15. Convey expert opinion, degree of certainty in the diagnosis, and its implications effectively.

1.1.16. Share patient information in a manner which respects privacy and confidentiality, de-identifying images for education purposes and obtaining consent for use when required.

1.2 COLLABORATOR

Working with others

1.2.1. Develop a good working relationship with others, including members of the immediate and wider clinical team.

1.2.2. Respect and understand the role and expertise of the team including medical imaging technicians (MIT), allied health professionals and nurses.

1.2.3. Provide assistance and advice to referring doctors with regard to the most effective investigative pathway for a patient.

1.2.4. Set realistic expectations with regard to service delivery. Effectively liaise with other staff to prioritise and schedule patients.

1.2.5. Demonstrate respect for different opinions and approaches, negotiating and challenging when appropriate.

1.2.6. Seek advice from clinical colleagues where their expertise may contribute to a better outcome.

1.2.7. Take responsibility for assigned tasks and support others to achieve shared goals.

Contribution to multidisciplinary team meetings

1.2.8. Negotiate access to imaging studies performed external to the hospital or practice.

1.2.9. Collate and integrate imaging as required to facilitate decision making about patient management plans.

1.2.10. Facilitate the discussion of investigative options in a multidisciplinary team setting.

1.2.11. Participate in and coordinate multidisciplinary meetings, advising on the role that current and future imaging plays in the patient's journey and management.

1.2.12. Present independently at clinical meetings, including multidisciplinary team meetings.

1.2.13. Work collaboratively with other members of the multidisciplinary health care team.

Conflict management and resolution

1.2.14. Demonstrate respect toward colleagues.

1.2.15. Recognise signs of potential conflict and clinical situations that may lead to conflict.

1.2.16. Implement strategies to manage differences of opinion and prevent and/or resolve conflicts.

1.2.17. Negotiate an acceptable outcome of conflict for all parties, either individually or by leading others.

Handover

1.2.18. Determine when care should be transferred to another radiologist or health professional.

1.2.19. Demonstrate safe handover of care, using both verbal and written communication, post-radiological procedure or transfer to another health care team.

1.3 LEADER

Improvement of clinical radiology service delivery

1.3.1. Describe key indicators for monitoring service quality and performance in clinical radiology.

1.3.2. Identify where quality improvements might be initiated in the work environment.

1.3.3. Recognise the importance of and contribute to quality assurance and improvement activities in a department or practice.

1.3.4. Be familiar with incident reporting and monitoring systems, including the investigation of an adverse event, 'near-miss' or system error.

1.3.5. Participate in the development and implementation of patient safety initiatives.

Healthcare resources

1.3.6. Discuss funding arrangements for clinical radiology service delivery in Australia and New Zealand.

1.3.7. Recommend investigations for individual patients responsibly, with consideration of controlling costs of healthcare.

1.3.8. Allocate resources responsibly, considering and balancing the benefits to the patient and the hospital.

1.3.9. Promote the use of the Choosing Wisely recommendations and clinical decision rules to encourage clinicians to perform fewer scans to decrease potential harm to patients and target healthcare resources more effectively.

Leadership skills

1.3.10. Demonstrate leadership skills within the radiological team and department or practice.

1.3.11. Delegate clinical activities safely to colleagues and other members of the health care team.

1.3.12. Run effective and efficient meetings.

1.3.13. Discuss the key steps in managing change and initiate effective communication with regard to the implementation of new policies or processes.

Managing career and a practice

1.3.14. Set priorities and manage time to integrate practice and personal life.

1.3.15. Demonstrate strategies and techniques to manage the negative effects of stress and maintain personal health and wellness.

1.3.16. Be aware of the process and costs involved in establishing a new clinical radiology department or practice, including staffing, equipment and facility components.

1.4 HEALTH ADVOCATE

Individual patients

1.4.1. Recognise, and help overcome, barriers to quality patient care.

1.4.2. Advocate for patients in multidisciplinary meetings, ensuring management plans are patient-focused.

1.4.3. Advocate for investigations that minimise risk, radiation exposure and cost to the patient. Adhere to safety protocols to minimise risk and protect patients.

1.4.4. Apply jurisdictional privacy policies which govern the use of personal information within the service and disclosure to other parties.

1.4.5. Identify suspected neglect or abuse and report accordingly.

In the community

1.4.6. Advocate for additional services for communities in need.

1.4.7. Advocate for resources for radiological services which are evidence based, i.e. government subsidisation of current and emerging technologies.

1.4.8. Provide accurate information to the community and consumer groups with regard to issues relevant to clinical radiology.

1.5 PROFESSIONAL

Individual patients

1.5.1. Exhibit appropriate professional behaviours and relationships in all aspects of practice, demonstrating honesty, integrity, commitment, altruism and respect for diversity.

1.5.2. Recognise and respond appropriately to ethical issues encountered in practice. Adhere to radiological practice standards.

1.5.3. Prioritise urgent studies and take responsibility for communicating unexpected results to clinical team members.

1.5.4. Behave in a manner that is inclusive of social, ethnic and religious groups.

1.5.5. Acknowledge professional limitations and seek advice or help when required. Exhibit professional behaviours in technology-enabled communication.

Commitment to the profession

1.5.6. Fulfil and adhere to professional and ethical codes, standards of practice and regulations including but not limited to:

- Informed consent
- Mandatory reporting
- Occupational health and safety
- Privacy and confidentiality
- Credentialing.

1.5.7. Provide support to the profession through participation in scientific meetings and other educational events.

1.5.8. Maintain medical registration and relevant insurances. Speak respectfully of other clinicians and professionals.

1.5.9. Recognise and manage conflicts of interest.

1.5.10. Recognise the legal aspects of practice and the potential for radiologists to be defendants or consultants in litigation.

1.6 SCHOLAR

Lifelong learning

1.6.1. Identify opportunities to improve knowledge and skills, through reflection and evaluation of performance.

1.6.2. Seek feedback from patients, colleagues and other health professionals in relation to potential areas of improvement.

1.6.3. Actively participate in continuing professional development to address learning needs. Participate in audit of clinical results, including audit of personal practice.

1.6.4. Demonstrate knowledge of principles of the peer-review process and participate in peer review.

Evidence-based medicine

1.6.5. Discuss the concept of evidence-based best practice.

1.6.6. Employ a systematic process to keep up to date with current literature.

1.6.7. Define and describe levels of evidence and the principles of defining levels of evidence (e.g. NHMRC).

1.6.8. Critically appraise research papers and other research-related documents.

1.6.9. Assess the validity of a study, taking into consideration potential confounders and biases, and applicability to the local context.

1.6.10. Discuss relevant literature with patients, colleagues and other health professionals relevant to their clinical practice.

1.6.11. Revise and/or amend department protocols and imaging pathways as required, as new evidence emerges.

1.6.12. Integrate published evidence into daily radiological practice to improve patient care.

Research

1.6.13. Discuss the key principles, advantages and disadvantages of common clinical trial designs (e.g. randomised controlled trials, case-control studies, historical and concurrent controls, blind and double-blind studies).

1.6.14. Compare and contrast the aims of qualitative and quantitative research.

1.6.15. Explain common research terminology (e.g. hypotheses, endpoints, outcomes, incidence, prevalence, biases, intention-to-treat, number needed to treat).

1.6.16. Explain and utilise the concepts of sensitivity, specificity, positive predictive value and receiver operator curve in the evaluation and performance of radiological research.

1.6.17. Discuss common statistical methods and tests and their application. Discuss levels of significance, types of errors and power calculations.

1.6.18. Describe and select appropriate outcome measures (e.g. overall survival, disease-free survival, time to progression, quality of life).

1.6.19. Demonstrate knowledge of other types of research relevant to clinical radiology (e.g. laboratory, health economics and education research).

1.6.20. Identify areas of radiological practice where research is warranted, determine appropriate radiological research questions, and develop research methodology appropriate to questions.

1.6.21. Develop a sound research proposal, including a clear research question/s methodology, and ethics requirements.

1.6.22. Contribute to clinical research that advances radiological practice and patient care.

1.6.23. Describe and apply the principles of privacy, confidentiality, informed consent and disclosure of information relative to performance of research projects.

1.6.24. Comply with national standards for research ethics.

1.6.25. Respect intellectual property rights and take a strong stand against plagiarism. Disseminate research findings through publication.

1.6.26. Present research findings at scientific meetings.

Lifelong learning

1.6.27. Plan and deliver education for students, junior colleagues and other health professionals.

1.6.28. Apply novel methods and approaches to teaching.

1.6.29. Promote a safe learning environment.

1.6.30. Ensure patient safety is maintained when learners are involved. Encourage and mentor students and junior colleagues.

1.6.31. Contribute to the development of teaching/educational programs for other specialties. Provide constructive feedback to learners on their performance.

1.7 CULTURAL COMPETENCY

Cultural awareness and safety

1.7.1. Discuss the cultural determinants of health and its effect on equity, acknowledging that differences in health status are unfair and unjust and the result of differential access to the resources necessary for people to lead healthy lives.

1.7.2. Discuss how conscious and unconscious bias of health professionals may influence the care of patients.

1.7.3. Describe how the history of Aboriginal and Torres Strait Islander peoples (Australian) and Māori and Pacific peoples (New Zealand) may affect their health status, perception of medical services and interactions with health professionals.

- Further describe how the impacts of colonisation, biased perspectives, racism, and discrimination continue to prevent Māori, Aboriginal and Torres Strait Islander Peoples from receiving safe and quality care.

1.7.4. Discuss varying perceptions of health and illness across different cultures and apply this knowledge to individual patient care.

1.7.5. Apply knowledge of a patient's cultural, social and religious background, and individual beliefs in developing, communicating and carrying out management plans.

1.7.6. Recognise the family and community context of patients from different cultural backgrounds and its impact on consent, treatment and follow-up.

1.7.7. Partner with cultural support staff, including aboriginal liaison officers, to promote cultural safety and tailor care for patients from all cultural backgrounds.

1.7.8. Demonstrate a commitment to:

- Understanding personal cultural values and the influence these have on your interactions with patients and colleagues
- Ongoing development of personal cultural awareness and practices
- Challenge the cultural bias of individual colleagues or systemic bias within health care services where this will have a negative impact on patients.

Section Two
APPLIED IMAGING TECHNOLOGY

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Overview

The trainee will be able to:

- Describe the physical principles associated with image acquisition, quality and display
- Explain the regulatory requirements regarding imaging systems, quality assurance programs and radiation safety
- Discuss the safety implications regarding radiation exposure and how to optimise patient radiation dose and image quality.

2.1 THEORETICAL PRINCIPLES

By the completion of training, the trainee will be able to:

Basic Concepts of Electromagnetic Radiation (BCER)

2.1.1. Describe:

- Electromagnetic waves
- Relationship between frequency and wavelength
- The electromagnetic spectrum
- Sources of electromagnetic radiation
- Energy of photons.

2.1.2. Outline the principle of wave-particle duality of photons.

Production of X-Rays

2.1.3. Describe the production of X-rays and the distinction between Bremsstrahlung and Characteristic radiation.

2.1.4. Describe and illustrate the spectrum of X-ray energies produced by an X-ray tube.

2.1.5. Discuss the impact of changes in peak kilovoltage (kVp), anode material, milliampere (mA) and filtration on the X-ray spectrum, patient dose and image quality.

2.1.6. Describe and illustrate the basic components of X-ray tube construction.

2.1.7. Describe and illustrate the line focus principle.

2.1.8. Broadly describe and illustrate the heel effect and its implication for image quality.

Interactions between X-Rays and matter of relevance to medical imaging

2.1.9. Distinguish between atomic ionisation and excitation in respect of:

- Photostimulable phosphors
- Luminescence
- Thermoluminescent Dosimeters (TLDs).

2.1.10. Describe the interaction processes of photoelectric effect and Compton scattering.

2.1.11. Discuss the impact of field size, and patient thickness on scatter production.

2.1.12. Describe the coherent scattering interaction process.

2.1.13. Describe the process of attenuation.

2.1.14. Describe the attenuation of monoenergetic and polychromatic radiation in terms of linear and mass attenuation coefficients and half-value layers (HVLs).

2.1.15. Outline the factors that impact on attenuation.

Filters, collimators and grids

2.1.16. Explain what is meant by inherent and added filtration.

2.1.17. Describe the impact of filtration on the spectrum from an X-ray tube, including filter material (e.g. Al, Cu, K-edge and combination filters).

2.1.18. Describe how and why the following scatter reduction techniques work:

- Collimation
- Compression
- Grids (types, properties, implication for patient doses and image quality)
- Air gaps.

2.1.19. Discuss the implication of these techniques on image quality and dose.

Digital imaging concepts

2.1.20. Define what is meant by the following terms, and describe their application in image interpretation:

a. Image presentation

- Pixels and voxels
- Image matrix
- Windowing
- Grey scale display levels
- Multi-planar and curved reformatting
- Maximum/minimum intensity projections (MIP and MinIP)
- Volume rendering
- Subtraction imaging
- Post processing (e.g. edge enhancement).

b. Image display

- Monitor resolution
- Greyscale standard display function (GSDF)
- Ambient viewing conditions.

2.1.21. Distinguish between lossless and lossy images.

2.1.22. Describe the main elements of picture archiving and communications systems (PACS) and teleradiology.

2.1.23. Broadly discuss the general structure of a digital imaging and communication in medicine (DICOM) file.

2.1.24. Be aware of advanced imaging processing (e.g. perfusion, computer aided detection (CAD).

2.2 IMAGING TECHNOLOGY

By completion of training, the trainee will be able to:

Radiography and Fluoroscopy

Radiographic image acquisition

2.2.1. Describe the key elements of the digital radiography (DR) system that lead to image formation.

2.2.2. Differentiate between indirect (a-Si) and direct (a-Se) flat panel detector (DR) systems. Describe detector elements of DR systems.

2.2.3. Describe how an automatic exposure control (AEC) system operates in generic terms.

2.2.4. Generally describe the key factors that contribute to image quality for softcopy reporting.

2.2.5. Broadly describe the concept of dual energy X-ray absorptiometry (DEXA).

2.2.6. Broadly describe the elements involved in the acquisition of dental radiographic images, including intra oral, cephalometric and OPG imaging.

Fluoroscopic image acquisition

2.2.7. Describe the modes of fluoroscopic operation and compare them with high-resolution imaging acquisition, with regard to image quality and dose.

2.2.8. Compare and contrast flat panel detectors and image intensifiers.

2.2.9. Explain the implications of field size and pulsed fluoroscopy on image quality and patient dose.

2.2.10. Describe the purpose of automatic brightness control (ABC) and automatic dose rate control (ADRC) and broadly describe how they operate.

2.2.11. Describe the physical principles of digital subtraction angiography (DSA).

2.2.12. Describe the process of mask subtraction and understand the impact that the subtraction process has on image noise.

2.2.13. Describe what is meant by image processing operations such as pixel shifting and re- masking and explain why they are important in minimising impact of motion artefact.

2.2.14. Discuss the relationship of cumulative air kerma (CAK) and kerma-area product (KAP) to patient skin dose and effective dose.

2.2.15. Discuss strategies to minimise patient and operator dose while maintaining imaging quality.

2.2.16. Compare the application, image quality and dose of Cone Beam CT with fluoroscopy equipment, with conventional CT.

Measures of radiographic and fluoroscopic image quality

2.2.17. Discuss in detail the key image descriptors, contrast, spatial resolution, temporal resolution and noise.

2.2.18. Explain the impact of magnification and focal spot size on image quality.

2.2.19. Explain the impact of noise on image quality.

2.2.20. Explain what is meant by quantum mottle (random noise), signal-to-noise ratio (SNR) and contrast-to-noise ratio (CNR).

2.2.21. Define the line-spread function (LSF) and modulation transfer function (MTF).

2.2.22. Distinguish between quantum noise and other types of noise.

2.2.23. Explain the origin of image distortion arising from geometric effects.

Mammography

2.2.24. Describe the basic principles of mammography:

- Contrast improvement at low kVp
- Magnification and contact mammography technique
- Contrast versus radiation absorbed dose
- Compression techniques.

2.2.25. Describe the construction and operational principles of digital X-ray mammography equipment.

2.2.26. Discuss the impact of kVp, filtration, glandular content and breast thickness on the Mean Glandular Dose.

2.2.27. Describe tomosynthesis and stereotactic imaging processes.

2.2.28. Generally describe the:

- Performance characteristics of X-ray mammography equipment
- Impact of system geometry on spatial resolution
- Effect of image processing on image quality
- Use of CAD and quality assurance in mammography.

Ultrasound

2.2.29. Discuss the fundamental physics of ultrasound waves and the interactions that occur as it traverses through tissues and other media including:

- Interference, diffraction, resonance
- Reflection, refraction
- Attenuation absorption, scattering.

2.2.30. Describe the various types of ultrasound transducers available and select a transducer on the basis of its physical characteristics and suitability for a given application.

2.2.31. Outline the basic principles of ultrasound imaging and processing and how various technical factors affect image quality.

2.2.32. Describe how real-time systems work, and be aware of the interplay between temporal resolution, spatial resolution and depth of penetration.

2.2.33. Describe the basic physical principles underlying the use of the Doppler effect in ultrasound imaging.

2.2.34. Explain how choice of frequency affects attenuation, spatial resolution, and the maximum flow rate that can be detected.

2.2.35. Describe the operation of a simple duplex transducer.

2.2.36. Recognise common ultrasound artefacts and explain how they are formed, including:

- Multiple reflections – reverberation
- Attenuation
- Shadowing
- Enhancement
- Refraction – sound speed errors
- Beam width
- Aliasing in pulsed ultrasound Doppler (duplex and colour Doppler).

2.2.37. Discuss the basic parameters which characterise a sound wave, including:

- Wave motion and types of waves
- Wave length, frequency, phase
- Intensity, pressure, amplitude
- Decibel notation – intensity and amplitude
- Velocity in liquids and biological media
- Acoustic impedance.

2.2.38. Conduct simple calculations relating to frequency, wavelength and relative intensity in decibels.

2.2.39. Demonstrate working knowledge of the relative magnitudes of sound velocity, acoustic impedance and attenuation in various biological media, and their implications for imaging.

2.2.40. Describe details of the main physical parameters which characterise transducers and their effect on the image, including:

- Beam pattern – near and far field
- Focused transducers – types and techniques
- Broad bandwidth transducers.

2.2.41. Describe the basic principles of B-mode pulse-echo imaging, including parameters such as pulse length, frequency, pulse repetition frequency and time-gain compensation (TGC) affect the image.

2.2.42. Perform simple calculations using the Doppler shift equation and understand the concepts underlying spectral analysis colour Doppler and power Doppler.

2.2.43. Broadly describe the basic principles of:

- Panoramic imaging
- Harmonic
- Compounding
- 3D imaging
- Elastography
- US contrast agents.

2.2.44. Demonstrate a general working knowledge of more complex technology involving harmonic imaging, 3D imaging and ultrasound contrast agents.

Computed Tomography (CT)

2.2.45. Discuss the principles of CT scanning.

2.2.46. Describe various methods of image reconstruction including:

- Filtered back projection and iterative reconstruction
- Hounsfield units
- Field of view
- Reconstruction algorithm (aka filter or kernel)
- Electrocardiographic (ECG) gating (prospective and retrospective).

2.2.47. Explain how iterative reconstruction leads to dose reduction with similar image quality.

2.2.48. Describe and contrast the various scanner configurations used for CT scanning, including:

- Single versus multi-detector, including over-beaming
- Axial versus helical acquisition, including over-ranging
- Gantry rotation speeds
- Dual-source versus single source
- Dual-energy versus single energy
- AEC-mA modulation.

2.2.49. Define Hounsfield units (HU).

2.2.50. Discuss the quality of CT images in terms of spatial and contrast resolution, noise, and slice thickness, highlighting factors that affect each.

2.2.51. Distinguish between collimated slice width, acquired slice thickness and reconstructed slice thickness.

2.2.52. Discuss the impact of pixel size, imaged slice thickness, milliampere-seconds (mAs), kVp, algorithm and field view on image quality and patient dose.

2.2.53. Discuss the advantages of lower kVp techniques on intravenous contrast-enhanced images.

2.2.54. Describe the origin and appearance of common artefacts in CT images, including:

- Partial volume
- Motion
- Streak
- Beam hardening
- Ring.

2.2.55. Discuss radiation dose features unique to CT scanning techniques.

2.2.56. Explain in generic terms how tube current modulation works and its impact on patient dose.

2.2.57. Discuss the advantages and disadvantages of prospective and retrospective ECG gating.

2.2.58. Discuss the following different CT intervention modes and their advantages and disadvantages including their impact on occupational and patient dose:

- Step and shoot
- Continuous fluoroscopy.

2.2.59. Discuss the importance and application of dose descriptors and common diagnostic reference levels (DRLs):

- Computed tomography dose index (CTDI)
- Dose length product (DLP)
- Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) national dose reference levels for multidetector computed tomography (MDCT).

2.2.60. Describe the method of CT perfusion.

2.2.61. Optimise paediatric protocols (e.g. weight-based).

2.2.62. Broadly compare cone beam CT (e.g. dental, with fluoroscopy equipment) and conventional CT in terms of differences in acquisition, image quality and dose.

2.2.63. Generally describe the unique features of the X-ray tube used in CT.

Magnetic Resonance Imaging (MRI)

2.2.64. Describe basic Magnetic Resonance Imaging (MRI) including:

- Magnetic susceptibility
- Nuclear magnetic moments
- Effect of external magnetic field
- Nuclear precession
- Equilibrium magnetisation
- Significance of Radio Frequency (RF) pulse
- Resonance and Lamor frequency
- Free induction Delay (FID)
- Chemical shift types.

2.2.65. Discuss the significance and the uniqueness of the Larmor frequency for a nuclear species.

2.2.66. Describe the origin of the Free Induction Decay and discuss the key factors which determine its strength.

2.2.67. Describe the origin of the T1 and T2 relaxation mechanisms.

2.2.68. Describe the behaviour of T1 and T2 as the strength of the static field is changed. Describe the effect of field inhomogeneities and T2.

2.2.69. Discuss the advantages and characteristic features, including image contrast, effect on image quality and potential artefacts, for common pulse sequences including spin echo, fast spin echo, gradient echo and Echo Planar Imaging (EPI).

2.2.70. Outline the principles and advantages of different fat suppression techniques, including STIR, SPIR/SPAIR and DIXON.

2.2.71. Outline the advantages and disadvantages of imaging at different commercially available field strengths (e.g. 1.5 Tesla, 3 Tesla).

2.2.72. Describe how images are produced in reference to:

- Gradient fields
- Slice thickness and RF bandwidth
- Phase-encoding gradient
- Frequency encoding (readout) gradient
- Determinants of image acquisition time.

2.2.73. Discuss the physics behind the chemical shift phenomenon.

2.2.74. Describe interleaved multi-slice imaging and indicate why it is utilised.

2.2.75. Describe the factors that affect image quality, including:

- Signal-to-noise ratios
- Spatial resolution
- Common artefacts.

2.2.76. Describe the basic types of MR angiography (MRA).

2.2.77. Describe the basic principles of diffusion weighted imaging (DWI).

2.2.78. Generally:

- Discuss the role of the Fourier transform (FT) in MR image reconstruction
- Describe 2D-FT reconstruction methods in terms of the three time intervals (slice selection, phase encoding and frequency encoding)
- Compare the 3D-FT reconstruction technique with the 2D-FT method
- Identify the biomolecular species which may be analysed in clinical MR spectroscopy (MRS).

2.2.79. In relation to MRI, broadly describe:

a. Instrumentation

- Magnets
- Gradient coils
- RF coils and electronics
- Functional MRI.

b. Hybrid MR-PET

c. Intra operative MR

Nuclear Medicine

2.2.80. Describe:

- Atomic structure
- Isotopes
- Radioactivity
  - Alpha
  - Beta
  - Gamma
  - Radioactive decay law
  - Half-life and decay constant
  - Activity and specific activity.
  - Standardised uptake value (SUV).

2.2.81. Perform simple calculations using the concepts of physical, biological and effective half-lives.

2.2.82. Describe the main features, mode of operation and performance characteristics of a positron emission tomography (PET) scanner.

2.2.83. Generally describe the:

- Main features of single photon emission computed tomography (SPECT)
- Purpose of CT in PET/CT and SPECT/CT scanners
- Statistics and mathematics of nuclear decay.

2.3 RADIATION PROTECTION AND PATIENT SAFETY

By completion of training, the trainee will be able to:

Radiation Biology and Dosimetry

2.3.1. Define the following main radiation quantities and units used in diagnostic radiology and nuclear medicine, and the parameters they measure:

- Exposure, Coulomb/kg
- Air kerma, gray
- Absorbed dose, gray
- Equivalent dose, Sievert and radiation weighting factors
- Effective dose, Sievert and tissue weighting factors.

2.3.2. Define basic dosimetry parameters:

- Skin dose
- Organ dose
- Effective dose
- Natural background dose.

2.3.3. Discuss the function of specific dose measurement methods used for radiological procedures and interpret the values.

2.3.4. Explain the implications of measured dose parameters, both in terms of overall risk and the risk to specific tissues and organs.

2.3.5. Be aware of the relative radiation doses from different radiological procedures, and how they compare to natural background radiation doses.

2.3.6. Examine the mechanism of how radiation interacts with tissue to cause biological damage (ionisation, excitation, free radicals), and the parameters used to quantify this damage.

2.3.7. Describe radiation carcinogenesis and other stochastic effects, including:

- Mechanisms, spectrum of DNA damage, DNA repair
- Latency period
- Effect of dose and dose rate
- Variation in organ radiation sensitivity and the effect of age
- Risk of carcinogenesis including consideration of low doses
- Hereditary effects
- Chromosome damage (brief overview).

2.3.8. Outline the reasons why risk associated with low dose stochastic effects underpin international dose limits and constraints.

2.3.9. Describe the hereditary and genetic implications of radiation exposure.

2.3.10. Assess the approximate risk from radiation exposure and convey this risk in a simple manner to patients and other staff.

2.3.11. Discuss the variation of radiation risk for cancer induction associated with the variation of sensitivities of different cancers to radiation, variations of sensitivity with age and their associated latency periods.

2.3.12. Describe the deterministic effects of radiation and the factors which influence them:

- Skin damage
- Sterility
- Cataract induction.

2.3.13. Identify the procedures that may deliver large doses of radiation.

2.3.14. Discuss the effects of radiation on the developing embryo or fetus at various stages of gestation.

2.3.15. Be aware of procedures which may deliver large doses to the embryo or fetus, and the actions to be taken in considering dose to a pregnant patient, prospectively or retrospectively.

2.3.16. Explain the importance and application of the dose descriptors:

- Dose area products (DAPs)
- CT dose index (CTDI)
- Dose-length product (DLP)
- Cumulative air kerma (CAK)
- Mean glandular dose (MGD).

Radiation Protection

2.3.17. Articulate the objective of radiation protection.

2.3.18. Discuss the medical and natural sources of radiation the population is subject to in Australia.

2.3.19. Describe the differences between medical exposure (including research participants and carers) and occupational and public exposure.

2.3.20. Describe the ICRP radiological protection principles, and how they relate to categories of exposure:

- Justification
- Optimisation (ALARA)
- Limitation – dose limits
- Occupational exposure including pregnant staff
- Public exposure.

2.3.21. State and compare the ICRP dose limits for various groups.

2.3.22. Describe, compare and contrast methods of occupational (diagnostic X-ray equipment, distance and time, protective clothing, shielding barriers) and public radiation dose reduction (restricting access to radiation areas, shielding barriers) in both diagnostic radiology and nuclear medicine environments.

2.3.23. Describe and contrast common methods of assessing occupational radiation dose including:

- Thermoluminescent dosimeters (TLDs)
- Optically stimulated luminescent dosimeters (OSLDs).

2.3.24. Describe the role of the radiation safety officer and the regulatory framework for radiation safety.

2.3.25. Describe what constitutes a radiation incident and compare to a radiation emergency.

Patient Safety

2.3.26. Describe the legal role and responsibilities of the radiologist in justification of imaging in diagnostic and interventional radiology.

2.3.27. Describe the concept of dose audit and Facility Reference Levels (FRLs) and the relationship to DRLs and explain how FRLs and DRLs are derived.

2.3.28. Describe the principle of dose optimisation, and how it is applied to diagnostic and interventional radiology.

2.3.29. Describe and contrast the most commonly used monitors for personal dose measurement.

2.3.30. Describe the various methods for calculation of patient and fetal radiation dose in radiology.

2.3.31. State approximate doses for common X-ray imaging (plain radiographic, ARPANSA CT DRLs) and common nuclear medicine examinations, ventilation/perfusion (V/Q), bone, radionuclide cardiac stress/rest scans, whole body FDG PET).

2.3.32. Describe the factors influencing patient dose in radiography, fluoroscopy, mammography and CT.

2.3.33. Generally describe the methods of calculating patient and fetal radiation dose for routine diagnostic nuclear medicine studies using ICRP publications.

2.3.34. Generally describe electronic dosimeters commonly available for personal dose measurement that give immediate radiation exposure feedback and their typical applications in medical imaging.

Safety in magnetic resonance imaging

2.3.35. Discuss safety issues (patient and environmental) and contra-indications in the use of MRI, including:

- Static magnetic field
- Radiofrequency field
- Gradient field
- Safety zoning of MRI departments
- Pregnancy, lactation and breast feeding
- Safety classification of implants and management of MR-conditional ones
- Emergencies including medical emergencies, quench and fires.

Safety in ultrasound

2.3.36. Discuss the main mechanisms by which ultrasound may damage tissue.

2.3.37. Outline safe levels of exposure and safety recommendations.

2.3.38. Discuss parameters commonly used in diagnostic ultrasound to indicate risk of bioeffects:

- Thermal index
- Mechanical index.

Safety in nuclear medicine

2.3.39. Discuss radiation safety considerations for patients undergoing other imaging examinations following common nuclear medicine imaging procedures (FDG PET, bone scan, VQ scan).

2.3.40. Broadly outline

- Precautions to take when handling unsealed radioactive sources(e.g. personal protective equipment (PPE), shielding, minimisation of exposure time)
- Simple decontamination procedures for radioactive materials (liquid and solid).

Quality assurance for diagnostic imaging equipment

2.3.41. Generally describe:

- The principles and benefits of quality assurance in imaging
- The need for increased quality assurance for asymptomatic imaging processes (e.g. screening programs)
- Quality control (QC) test on radiographic, nuclear medicine, hybrid, MRI and ultrasound equipment.

Section Three
ARTIFICIAL INTELLIGENCE

SECTION THREE
ARTIFICIAL INTELLIGENCE

By the completion of training, the trainee will be able to:

- Discuss the basic concepts and principles pertaining to machine learning
- Discuss the current state (as well as the likely future trajectory) of development and deployment of machine learning within clinical medicine
- Describe the stages of machine learning model development, testing/translation, implementation and utilisation in clinical practice
- Discuss the ethics of AI relevant to medical imaging
- Discuss importance of appropriate measures to ensure safety during development, testing, deployment and post-deployment monitoring of machine learning
- Be aware of possible failure modes of machine learning systems
- Outline the potential benefits and limitations of machine learning in patient care and clinical medicine
- Describe the limitations of human perception and performance
- Discuss how those using AI may best use the combination of machine and human characteristics to provide high quality care to patients.

Section Four
ANATOMY

SECTION FOUR
ANATOMY

4.1 BRAIN

By completion of training, the trainee will be able to:

4.1.1. Identify and describe the radiological anatomy of the following structures on all relevant imaging modalities:

- Cerebrum, including white matter tracts, grey matter nuclei, cerebral cortex and cerebral sulci and gyri
- Functional neuroanatomy of the cortical motor and sensory systems, speech, auditory, visual systems and the limbic system
- Brainstem, including white matter tracts and grey matter nuclei
- Cerebellum
- Ventricular system and cerebrospinal fluid (CSF) cisterns
- Pituitary gland and related structures
- Cranial nerves and their nuclei
- Meninges and associated spaces
- Vascular supply to the brain – arterial and venous vessels and dural venous sinuses.

4.1.2. Outline the embryological development of:

- Circle of Willis
- Dural venous sinuses and cerebral veins
- Pituitary gland.

4.1.3. Describe the normal anatomical variants, including but not limited to:

- Circle of Willis
- Dural venous sinuses and cerebral veins
- Ventricular system and basal cisterns
- Pituitary gland.

4.2 HEAD AND NECK

By completion of training, the trainee will be able to:

4.2.1. Identify and describe the radiological anatomy of the following structures on all relevant imaging modalities:

- Cranial vault including bones, scalp and neurovascular and lymphatic supply
- Anterior, middle and posterior cranial fossae, skull base, foramina and contents
- Facial bones, sutures and foramina
- Temporal bone and surrounding structures including external ear, middle ear and inner ear
- Orbit including boundaries, compartments, contents and neurovascular and lymphatic supply
- Nasal cavity and paranasal sinuses including bones and foramina / canals and neurovascular and lymphatic supply

- Oral cavity including tongue, salivary glands, neurovascular and lymphatic supply
- Mandible and temporomandibular joint
- Teeth
- Superficial face
- Fasciae and spaces of the neck
- Muscles of the neck
- Trachea and larynx including spaces, cartilages and neurovascular and lymphatic supply
- Pharynx including divisions, pharyngeal muscles, neurovascular and lymphatic supply
- Thyroid and parathyroid glands including neurovascular and lymphatic supply
- Temporal, infra-temporal and pterygopalatine fossae contents and boundaries
- Major vessels and nerves of the head and neck
- Lymphatics and lymph nodes of the neck including nodal levels.

4.2.2. Outline the embryological development of:

- Thyroid and parathyroid glands
- Branchial clefts and sinuses.

4.2.3. Describe the normal anatomical variants of the structures of the head and neck, including but not limited to:

- Paranasal sinuses
- Neck vessels
- Thyroid and parathyroid glands.

4.3 SPINE

By completion of training, the trainee will be able to:

4.3.1. Identify and describe the radiological anatomy of the following on all relevant imaging modalities:

- Vertebrae, sacrum and associated joints
- Neurovascular and lymphatic supply of the spine
- Paraspinal muscles and ligaments
- Spinal cord, including structure, spinal grey matter, spinal white matter tracts, functional systems, cauda equina and nerve roots
- Spinal meninges and spaces
- Vascular supply to the spinal cord – arterial and venous.

4.3.2. Outline the embryological development of the vertebrae and spinal cord.

4.3.3. Describe the normal anatomic variants of the spine, including but not limited to:

- Vertebrae including segmentation
- Spinal cord including blood supply
- Caudal equina and nerve roots.

4.4 THORAX

By completion of training, the trainee will be able to:

4.4.1. Identify and describe the radiological anatomy of the following structures on all relevant imaging modalities:

- Chest wall including muscles, ligaments and bones, as well as neurovascular and lymphatic supply
- Muscles of the thorax
- Mediastinum including its subdivisions
- Mediastinal viscera including heart chambers, structure, neurovascular and lymphatic supply
- Major vessels and nerves of the thorax
- Pericardium and pericardial spaces
- Tracheobronchial tree and lungs including divisions, structure, neurovascular and lymphatic supply
- Pleura and pleural spaces
- Lymphatics and lymph nodes of the thorax
- Diaphragm including attachments, hiatuses and neurovascular supply.

4.4.2. Outline the embryological development of:

- Aorta
- Superior vena cava
- Pulmonary vasculature.

4.4.3. Describe the normal anatomic variants of the thorax, including but not limited to:

- Coronary vascular supply
- Great vessels
- Pulmonary vasculature
- Lungs, pleura and tracheobronchial tree.

4.4.4. Identify and describe the radiological anatomy of the breast including neurovascular and lymphatic supply.

4.4.5. Describe the embryologic development of the breast and normal anatomical variants of the breast including neurovascular and lymphatic supply.

4.5 ABDOMEN AND PELVIS

By completion of training, the trainee will be able to:

4.5.1. Identify and describe the radiological anatomy of the following structures on all relevant imaging modalities:

- Anterolateral and posterior abdominal walls including muscles, ligaments and bones, as well as neurovascular and lymphatic supply
- Bones of the abdomen and pelvis
- Muscles of the abdomen and pelvis
- Pelvic floor and perineum including fascia, pelvic ligaments and the urogenital and anal triangles
- Major vessels and nerves of the abdomen and pelvis
- Peritoneum, peritoneal reflections, boundaries and spaces

- Retroperitoneum, divisions, boundaries and contents
- Hollow viscera including neurovascular and lymphatic supply
- Solid viscera including neurovascular and lymphatic supply
- Hepatopancreaticobiliary system including neurovascular and lymphatic supply
- Genitourinary structures including neurovascular and lymphatic supply, as well as the external genitalia
- Lymphatics and lymph nodes of the abdomen and pelvis.

4.5.2. Outline the embryological development of:

- Foregut, midgut and hindgut including the solid organs related to the dorsal and ventral mesogastrium
- Inguinal canal and scrotum
- Urogenital tracts of the male and female
- Abdominal aorta and inferior vena cava.

4.5.3. Describe the normal anatomic variants of the structures in the abdomen and pelvis, including but not limited to:

- Major arteries and veins
- Major splanchnic arteries and veins
- Biliary tree
- Hepatic vasculature
- Pancreas and pancreatic ducts
- Urogenital tracts of the male and female.

4.5.4. Recognise and describe the radiological anatomy of the placenta and maternal-fetal circulation.

4.6 UPPER AND LOWER LIMBS

By completion of training, the trainee will be able to:

4.6.1. Identify and describe the radiological anatomy of the following on all relevant imaging modalities:

- Bones and joints including ligaments and intra-articular structures
- Normal development of the major bones, including ossification of physes
- Muscles and tendons including description of their actions
- Cervical, brachial, lumbar and sacral plexuses
- Major vessels of the limbs including course, branches and distribution
- Major nerves of limbs including segmental derivation, course, branches and distribution
- Lymphatics and lymph nodes of the limbs
- Anatomical spaces within the upper and lower limbs including but not limited to the axilla, cubital fossa, carpal tunnel, femoral triangle, popliteal fossa and tarsal tunnel.

4.6.2. Describe the normal embryological development of the major bone, including ossification of physes, carpals and tarsals.

4.6.3. Describe the normal anatomic variants of the upper and lower limbs, including but not limited to:

- Accessory ossicles, bony and ligamentous variants
- Vascular variants.

Section Five
PATHOLOGY

SECTION FIVE
PATHOLOGY

Refer to the clinical conditions list in Appendix 1

5.1 GENERAL PATHOLOGY

By completion of training, the trainee will be able to:

5.1.1. Explain and describe the cellular adaptations of growth and differentiation including hyperplasia, hypertrophy, atrophy, metaplasia.

5.1.2. Explain and describe cell injury and cell death including necrosis and apoptosis.

5.1.3. Describe intracellular accumulations and recognise their relevance in pathological conditions including lipids, proteins, glycogen, pigments.

5.1.4. Explain the causes of pathological calcification and describe the associated morphological changes.

5.1.5. Discuss the pathological basis of acute and chronic inflammation.

5.1.6. Explain the pathological processes of regeneration, repair and scar formation, fibrosis and healing in specialised tissue (e.g. healing of a fracture).

5.1.7. Discuss and describe the pathological basis of haemodynamic disorders, thromboembolic disease and shock, then expand to cover following systemic disorders:

- Oedema and effusions
- Hyperaemia and congestion
- Haemorrhagic disorders
    - Defects of primary haemostasis (platelets)
    - Defects of secondary haemostasis (coagulation factors).
- Thrombosis
- Disseminated intravascular coagulation
- Embolism
- Infarction
- Shock.

5.1.8. Define and describe the pathological basis of conditions of the immune system such as hypersensitivity reactions, autoimmune diseases, immunodeficiency syndromes and amyloidosis, then expand to cover the following systemic disorders:

- Systemic lupus erythematosus
- Systemic sclerosis (scleroderma)
- Vasculitis
    - Large vessel: Giant cell (temporal) arteritis, Takayasu arteritis
    - Medium vessel: polyarteritis nodosa, Kawasaki disease
    - Small vessel: granulomatosis with polyangiitis, Churg-Strauss syndrome.
- IgG4-related disease
- Rejection of tissue transplants

- Acquired immunodeficiency syndrome (AIDS)
- Amyloidosis.

5.1.9. Define tumours according to contemporary tumour nomenclature and be familiar with current classification and staging systems.

5.1.10. Identify characteristics of benign and malignant tumours (e.g. degree of cellular differentiation, presence and degree of local invasion, presence of metastatic disease and pathways of spread).

5.1.11. Recognise and describe the clinical aspects of neoplasia including local effects, hormonal effects and paraneoplastic syndromes.

5.1.12. Outline the relevance of commonly used tumour markers. Describe the pathological changes associated with infections.

5.1.13. Recognise the pathological consequences of, and describe the morphological changes associated with:

- Radiation injury
- Obesity
- Diabetes mellitus
- Tobacco
- Alcohol
- Adverse drug reactions
- Occupational exposures
- Drug abuse
- Poisons
- Nutritional deficiencies.

Section Six
DIAGNOSTIC RADIOLOGY

SECTION SIX
DIAGNOSTIC RADIOLOGY

Refer to the clinical conditions list in Appendix 1

Overview

This section of the learning outcomes defines the competencies that trainees are expected to attain in relation to the daily practice of diagnostic and clinical radiology.

It represents a culmination of skills, knowledge and attitudes that enable the trainee to facilitate the safe practice of diagnostic radiology. This should span the continuum of patient care from receipt of an imaging referral to the diagnostic report and any subsequent role in patient management.

The general diagnostic learning objectives refer to the following radiological studies (including advanced imaging techniques):

- X-ray
- Ultrasound (US)
- Computed tomography (CT) scan
- Magnetic resonance imaging (MRI) scan
- Nuclear medicine (NM) scans
- Mammography
- Bone mineral densitometry (BMD).

6.1 GENERAL DIAGNOSTIC RADIOLOGY

By the completion of training, the trainee will be able to:

Safe Clinical Practice

6.1.1. For all imaging modalities used to diagnose and evaluate abnormalities:

- Describe the principles, indications, advantages and disadvantages, limitations and contraindications for use
- Outline specific protocols.

6.1.2. Discuss imaging studies or procedures with the referring doctor, ensuring the examinations are optimised to support and assist in treatment decisions.

6.1.3. Prioritise imaging requests based on clinical urgency.

6.1.4. Ensure that the imaging request is appropriate for a patient's clinical issues.

6.1.5. Consider the clinical information associated with the patient's presentation, construct a differential diagnosis and facilitate or recommend the most appropriate imaging pathway.

6.1.6. Explain and justify the imaging pathway best suited to facilitate a diagnosis for a clinical condition with reference to:

- Detailed knowledge of imaging modalities (***refer to Applied Imaging Technology***)
- A working knowledge of pathology (***refer to Pathology***)
- Principles of evidence-based practice.

6.1.7. Discuss indications and contraindications for imaging studies with clinicians and patients.

6.1.8. Advocate for investigations that minimise risk and radiation exposure to the patient.

6.1.9. Describe the pharmacokinetics, indications, contraindications and possible complications of using different types of contrast agent.

6.1.10. Recognise the risks associated with particular imaging modalities and associated contrast agents and justify their use.

6.1.11. Explain the nature of potential adverse events, such as allergic reactions, to patients and take any necessary precautions as required.

6.1.12. Facilitate the performance of appropriate imaging examinations.

6.1.13. Adhere to safety protocols to minimise risk while protecting patients from harm.

6.1.14. Promote high standards of diagnosis, management and safety for patients, ensuring imaging protocols, image interpretation and procedures are conducted optimally.

6.1.15. Maintain responsibility for patient care throughout the diagnostic imaging process.

6.1.16. Manage complications related to the process of image acquisition (e.g. contrast reaction or extravasation).

6.1.17. Explain the reasoning behind additional investigative options, should this be required after initial examinations have been conducted.

6.1.18. Recognise the role of non-imaging investigations and incorporate them into practice.

6.1.19. Ensure a medical and operational handover for patients where their imaging is incomplete and/or an ongoing imaging investigation, particularly if they are critically ill.

Image Interpretation

6.1.20. Synthesise any relevant patient information from multiple sources (including previous imaging or medical records) to establish a better understanding of their current imaging.

6.1.21. Conduct a quality assessment of the images.

6.1.22. Perform a thorough and systematic review of the imaging examination and perceive abnormalities.

6.1.23. Recognise and correctly interpret artefacts associated with all imaging modalities.

6.1.24. Apply knowledge of anatomy (***refer to Anatomy***) and pathology (***refer to Pathology***) and identify abnormalities, taking into consideration:

- The range of normal variants (especially those that mimic disease)
- Changing appearance with age
- Physiological states
- Morphological changes of pathological tissues.

6.1.25. Integrate a broader knowledge of clinical presentations, imaging appearances and pathology to form an appropriate diagnosis and/or differential diagnosis.

6.1.26. Recognise findings that constitute a medical emergency to expedite and implement local management protocols.

6.1.27. Communicate relevant findings to referrers and patients when appropriate, including diagnoses and their implications.

6.1.28. Directly communicate with the referrer in cases that have urgent clinical priority, findings of malignancy requiring treatment, or diagnoses that have the potential to harm others.

6.1.29. Communicate unexpected or significant findings in a timely and appropriate manner, according to clinical urgency, and confirming receipt of the findings.

Image Reporting

6.1.30. Apply the ***Clinical Radiology Report Writing Guidelines*** when formulating reports on imaging studies.

6.1.31. Utilise professional medical language which is clear and matches the referrer's expected level of knowledge.

6.1.32. Confidently use terminology which is widely understood and has a commonly agreed meaning among medical and allied health practitioners.

6.1.33. Utilise contemporary guidelines for the staging, monitoring and reporting of benign and malignant disease.

6.1.34. Assign class of diagnosis (e.g. benign/ normal variant/ probable malignancy/ significant abnormality) and direct further investigations where required.

6.1.35. Convey expert opinion, degree of certainty in the diagnosis, and its implications effectively. Respond to error in reporting with a professional approach to amending reports.

6.1.36. Provide the opportunity for the referring doctor to discuss the imaging findings in all cases.

6.2 BRAIN

By the completion of training, the trainee will be able to:

Specific imaging and interpretation of the brain

General learning outcomes for diagnostic radiology are listed at the start of this section. In addition, further learning outcomes are provided below specific to the imaging of the brain.

CT

6.2.1. Interpret and explain:

- CT venography
- CT perfusion.

MRI

6.2.2. Discuss the basic principles and utility of MR diffusion and MR perfusion.

6.2.3. Discuss MR spectroscopy and blood oxygenation level dependent (BOLD) functional MRI.

Nuclear Medicine

6.2.4. Demonstrate knowledge of the principles, indications and limitations for SPECT and PET-CT scans in neuroradiology imaging.

6.2.5. Discuss tracer options for neuroradiology imaging (e.g. fluorodeoxyglucose (FDG), fluoroethyl-L-tyrosine (FET) and dodecane tetraacetic acid (DOTATATE).

Non-Radiological Interventions

6.2.6. Discuss the role of investigations such as EEG, nerve conduction studies and CSF examination.

6.3 HEAD AND NECK

By the completion of training, the trainee will be able to:

Specific imaging and interpretation of the head and neck

General learning outcomes for diagnostic radiology are listed at the start of this section. In addition, further learning outcomes are provided below specific to imaging of the head and neck.

X-Ray

6.3.1. Interpret orthopantomogram (OPG).

CT

6.3.2. Plan CT for functional endoscopic sinus surgery.

6.3.3. Supervise and interpret a 4D assessment of the parathyroid glands.

6.3.4. Discuss the advantages and disadvantages of cone beam CT in head and neck, ENT and dental imaging.

Nuclear Medicine

6.3.5. Demonstrate knowledge of the principles, indications and limitations for PET-CT scans in head and neck imaging.

6.3.6. Demonstrate knowledge of the principles, indications and limitations for the following nuclear medicine studies:

- Sestamibi scan (for detecting parathyroid adenoma)
- Thyroid scan (for evaluation of thyroid disorders)

- Gallium-67 scan (for evaluation of infection)
- Bone scan including SPECT.

Non-Radiological Investigations

6.3.7. Discuss the role of endoscopy for head and neck conditions.

6.4 SPINE

By the completion of training, the trainee will be able to:

Specific imaging and interpretation of the spine

General learning outcomes for diagnostic radiology are listed at the start of this section. In addition, further learning outcomes are provided below specific to the imaging of the spine.

X-Ray

6.4.1. Interpret and describe curvature abnormalities of the spine including dynamic assessment.

6.4.2. Perform an assessment of stability.

CT

6.4.3. Discuss the utility of and interpret CT myelography.

MRI

6.4.4. Discuss the utility of in/out of phase imaging.

6.4.5. Discuss the utility of diffusion imaging.

Nuclear Medicine

6.4.6. Demonstrate knowledge of the principles, indications and limitations for the following nuclear medicine scans in spine imaging:

- PET-CT scan (including the commonly used tracers such as FDG, Neuroendocrine imaging (DOTATE) & prostate-specific membrane antigen (PSMA)
- Bone scan including SPECT
- Gallium-67 scan i.e. infection.

Non-Radiological investigations

6.4.7. Discuss the role of other investigations such as electrophysiology and CSF analysis.

6.5 CARDIOTHORACIC

By the completion of training, the trainee will be able to:

Specific imaging and interpretation of the thorax

General learning outcomes for diagnostic radiology are listed at the start of this section. In addition, further learning outcomes are provided below specific to cardiothoracic imaging.

Ultrasound

6.5.1. Perform thoracic ultrasound to diagnose pleural effusions and plan image-guided pleural aspiration and drainage.

CT

6.5.2. Discuss the principles of and interpret high-resolution chest CT (HRCT).

6.5.3. Protocol and report CT coronary angiography (CTCA).

MRI

6.5.4. Discuss strengths and weaknesses of MRI in cardiothoracic disease.

6.5.5. Recognise common pathologies such as aortic dissection on common sequences.

Nuclear Medicine

6.5.6. Identify pulmonary emboli on VQ scans (including the addition of SPECT) and outline the role of the technique in diagnosing pulmonary thromboembolic disease.

6.5.7. Describe the use of PET-CT scan and its role in staging pulmonary malignancy.

Population Screening

6.5.8. Discuss the role of low-dose CT screening for lung cancer.

6.5.9. Discuss the role of (CXR) and CT screening for occupational lung disease.

Non-Radiological Investigations

6.5.10. Discuss the role of lung function tests in diffuse lung disease.

6.6 ABDOMEN AND PELVIS

By the completion of training, the trainee will be able to:

Specific imaging and interpretation of the abdomen and pelvis

General learning outcomes for diagnostic radiology are listed at the start of this section. In addition, further learning outcomes are provided below specific to imaging of the abdomen and pelvis.

Ultrasound

6.6.1. Perform and interpret a Doppler assessment of abdominal vasculature and viscera.

6.6.2. Demonstrate knowledge of the indications, principles and limitations of contrast enhanced ultrasound of abdominal viscera.

6.6.3. Discuss the principles behind focused assessment with sonography for trauma (FAST) scanning and interpret images.

CT

6.6.4. Protocol, perform and report:

- CT colonography.

MRI

6.6.5. Protocol and report:

- Liver specific contrast studies
- Magnetic resonance cholangiopancreatography (MRCP).

Nuclear Medicine

6.6.6. Demonstrate knowledge of the principles, indications and limitations for the following nuclear medicine examinations of the abdomen:

- Gastrointestinal (GIT) bleeding study
- Meckel scans
- Diethylene triamine pentaacetic acid (DTPA) /dimercaptosuccinic acid (DMSA) /mercaptoacetyletriglycine (MAG III) scan
- Meta-iodobenzylguanidine (MIBG)
- PET-CT scan, including FDG, neuroendocrine (i.e. DOTA-TATE) and PMSA PET tracers).

Non-Radiological Investigations

6.6.7. Discuss the role of investigations such as endoscopy, colonoscopy, capsular endoscopy and manometry.

6.7 MUSCULOSKELETAL SYSTEM

By the completion of training, the trainee will be able to:

Specific imaging and interpretation of the musculoskeletal system

General learning outcomes for diagnostic radiology are listed at the start of this section. In addition, further learning outcomes are provided below specific to imaging of the musculoskeletal system.

Ultrasound

6.7.1. Perform and interpret ultrasound of the three major upper and lower joints, muscles, tendons and ligaments.

MRI

6.7.2. Understand the indications for, contraindications and interpret MR arthrography.

Nuclear Medicine

6.7.3. Discuss the role of nuclear medicine in musculoskeletal disease, i.e. infection and tumour.

6.7.4. Discuss how to perform a bone scan (including addition of SPECT), consider its major limitations and interpret the scan.

Bone Mineral Densitometry (BMD)

6.7.5. Explain and interpret BMD scans.

6.8 OBSTETRICS AND GYNAECOLOGY

By the completion of training, the trainee will be able to:

Specific imaging and interpretation for obstetrics and gynaecology

General learning outcomes for diagnostic radiology are listed at the start of this section. In addition, further learning outcomes are provided below specific to imaging of obstetrics and gynaecology.

Ultrasound

6.8.1. Perform and interpret female pelvic ultrasound.

6.8.2. Explain the principles of routine screening for obstetric abnormality in the first and second trimester.

6.8.3. Perform and interpret obstetric ultrasound, including ultrasound in 1st, 2nd and 3rd trimesters of pregnancy.

6.8.4. Discuss the role of uterine artery dopplers.

CT

6.8.5. Interpret CT scanning of gynaecological pathology.

MRI

6.8.6. Discuss the role of MRI of the feotus and in Placenta Accreta spectrum.

6.8.7. Discuss the role of MRI in gynaecology disorders, including deep endometriosis.

Nuclear Medicine

6.8.8. Demonstrate knowledge of the principles, indications and limitations of PET-CT scan in staging of gynaecological malignancy.

6.8.9. Discuss the role of VQ scan in diagnosing pulmonary thromboembolic disease in pregnancy and postpartum patients (including technique, diagnostic accuracy, limitation, radiation risk and availability).

Non-Radiological Investigations

6.8.10. Discuss the role of other investigations such as first and second trimester screening investigations for aneuploidy and neural tube defect, non-invasive pre-natal testing (NIPT), chorionic villous sampling and amniocentesis.

6.9 BREAST

By the completion of training, the trainee will be able to:

Specific imaging and interpretation for the breast

General learning outcomes for diagnostic radiology are listed at the start of this section. In addition, further learning outcomes are provided below specific to imaging of the breast.

Mammography

6.9.1. Explain the distinction between screening and diagnostic mammography, including the rationale for double reading in screening mammography.

6.9.2. Interpret and explain mammographic features of benign and malignant disease. Interpret breast tomosynthesis.

6.9.3. Demonstrate knowledge of contrast mammography.

Ultrasound

6.9.4. Perform and interpret breast ultrasound to differentiate benign from malignant disease.

6.9.5. Discuss the role of ultrasound for breast cancer screening of dense breasts.

MRI

6.9.6. Interpret and explain:

- MRI differentiation between benign and malignant disease
- Breast implant MRI.

6.9.7. Discuss the role of MRI in breast cancer screening in high risk women.

Nuclear Medicine

6.9.8. Outline the indications/contraindications for PET/CT in breast cancer imaging.

6.9.9. Discuss the accuracy of PET or PET/CT compared with other modalities.

Population Screening

6.9.10. Discuss:

- Principles of mammographic screening
- Evidence for population screening
- Population vs. sporadic screening
- Mammographic and MRI screening for high risk women.

Non-Radiological Investigations

6.9.11. Discuss the role of investigations such as testing for BRCA-1 and BRCA-2 genes.

6.9.12. Explain the importance of hormone receptor markers in breast cancer.

6.10 PAEDIATRIC

By the completion of training, the trainee will be able to:

Specific imaging and interpretation for paediatrics

General learning outcomes for diagnostic radiology are listed at the start of this section. In addition, further learning outcomes are provided below specific to paediatric imaging.

Ultrasound

6.10.1. Perform and interpret neonatal cranial and spine ultrasound.

6.10.2. Perform and interpret hip ultrasound.

CT

6.10.3. Interpret CT for congenital heart disease, vascular rings and airway anomalies.

MRI

6.10.4. Protocol and interpret a broad range of MRI studies in the paediatric population, including:

- Brain and spine
- Abdomen
- Musculoskeletal.

Nuclear Medicine

6.10.5. Demonstrate knowledge of the principles, limitations and indications for

- DTPA / DMSA / MAG III scan
- HIDA scan for biliary dysfunction
- MIBG scan for neuroblastoma
- PET-CT scans for paediatric tumours including tracers such as FDG and DOTATATE
- VQ scan for airway anomalies and perfusion
- Thyroid scan for thyroid anomalies.

6.11 GENETIC SYNDROMES

By the completion of training, the trainee will be able to:

Specific imaging and image interpretation for systemic medical conditions

General learning outcomes for diagnostic radiology are listed at the start of this section. There are no additional outcomes specific to this topic area.

Section Seven
PROCEDURAL RADIOLOGY

SECTION SEVEN
PROCEDURAL RADIOLOGY

Overview

This section of the learning outcomes defines the competencies that trainees are expected to attain in relation to the daily practice of procedural clinical radiology.

It represents a culmination of skills, knowledge and attitudes that enable the trainee to facilitate the safe practice of basic procedural radiology. This should span the continuum of patient care from receipt of an imaging referral to the diagnostic report and any subsequent role in patient management.

The general procedural leaning objectives refer to diagnostic and therapeutic procedures performed under the following radiological guidance:

- Fluoroscopy
- Ultrasound
- Computed tomography (CT)
- Magnetic resonance imaging (MRI)
- Mammography
- Angiography.

7.1 GENERAL PROCEDURAL RADIOLOGY

By the completion of training, the trainee will be able to:

Risk Assessment and Informed Consent (NB: Some of the below may take place in a pre-procedural consultation)

7.1.1. Discuss the clinical significance of pathologies requiring radiological intervention.

7.1.2. Determine patients' suitability for diagnostic and therapeutic interventional procedures, after considering indications, contraindications and risks as well as a review of relevant prior imaging.

7.1.3. Assess the urgency of the clinical situation. Determine optimal imaging guidance.

7.1.4. Identify the radiation and safety requirements for the procedure.

7.1.5. Conduct a thorough pre-procedure assessment to identify patient conditions that may affect the safety and/or effectiveness of the procedure:

- Age-related risks including pregnancy status
- Allergies and possible reactions to contrast agents
- Medications, including anticoagulation
- Need for analgesia or sedation
- Historical or current medical conditions (e.g. diabetes, renal dysfunction, haematological, coagulopathy)
- Anxiety
- Other possible contraindications.

7.1.6. Address any risks identified by implementing suitable protocol or recommend the intervention is not undertaken.

7.1.7. Ensure and document that the patient has received information (preferably verbally and written) about the procedure with sufficient time to consider the intervention and any possible alternatives.

7.1.8. Discuss the procedures, including the possible risks involved and expected outcomes and check patient understanding to confirm informed consent.

7.1.9. Document patient consent in medical records.

Infection Control

7.1.10. Demonstrates knowledge and application of infection control guidelines, including:

- Handwashing
- Use of personal protective equipment (PPE)
- Reprocessing of instruments and equipment
- Set up of sterile trays
- Systems for handling blood, other body fluids, nonintact skin and mucous membranes
- Disinfection of equipment and instruments
- Needle and waste disposal.

7.1.11. Demonstrates application of additional precautions to prevent the transmission of infectious disease.

7.1.12. Be aware of notifiable diseases which must be reported and inform the relevant local public health unit or national authority.

Image guided interventions for procedural radiology

7.1.13. Discuss the practice and principles of imaging guidance.

7.1.14. Select appropriate imaging guidance to perform interventions or procedures.

7.1.15. Apply knowledge of anatomy (***refer to section Four – Anatomy)*** that is relevant to conducting the intervention or procedure, including but not limited to:

- Surface imaging anatomy
- Arterial and venous anatomy
- Peritoneal anatomy
- Urinary tract anatomy
- Biliary anatomy
- Spinal and central nervous system anatomy.

7.1.16. Utilise the following core skills under image guidance (US, CT, fluoroscopy, MRI, Angiography, Mammography):

- Aspiration, biopsy techniques and injections – lesion/solid organ
- Drain insertion techniques including fixation, monitoring, maintenance and removal
- Vascular access techniques (venous – peripherally inserted central catheter (PICC), central venous line, arterial) including management of puncture sites and related complications).

7.1.17. Discuss the principles of blood coagulation and appropriately manage abnormalities of coagulation in relation to biopsies or interventional procedures.

7.1.18. Describe the effect of drugs (e.g. aspirin, clopidogrel and other anticoagulants) in relation to biopsies and interventional procedures.

7.1.19. Document procedure and detail post-procedural care in notes, including any post- procedural instructions or recommendations for further imaging or intervention.

7.1.20. Document and communicate any procedural complications to the referring doctor, patient/family and ensure appropriate follow-up.

7.1.21. Communicate any unexpected or urgent results direct to the referring doctor, patient/family and ensure appropriate follow-up.

7.1.22. Ensure there is appropriate medical and operational handover between attending radiology staff including between different staff shifts.

Safe Sedation

7.1.23. Conduct a thorough pre-sedation assessment of a patient, identifying clinical features, pre-existing conditions and medications that predispose patients to adverse sedation related events.

7.1.24. Stratify patients according to risk and refer those patients at high risk of adverse sedation-related events to a specialist anaesthetist.

7.1.25. Determine the requirements for analgesia and/or anxiolysis before the procedure, taking into account the complexity and likely discomfort of the procedure for the patient.

7.1.26. Clearly communicate the risks of procedural sedation to the patient (in addition to risks associated with the procedure itself), to obtain valid informed consent and address patient expectations.

7.1.27. Prepare for an episode of procedural sedation ensuring that:

- Equipment for monitoring and for emergencies is available and functional in both the procedure and recovery areas

- The minimum recommended staff are present during the procedure and in the recovery area and all have current basic life support skills
- At least one clinical staff member present is current in advanced life support skills and is immediately available in the event of an emergency
- Drugs for sedation and emergencies are immediately available
- All team members have a shared understanding of their responsibilities and the patient care plan, including emergency protocols.

7.1.28. Discuss the pharmacology of drugs used intravenously for procedural sedation. Describe how the use of multiple drugs may produce synergistic or antagonistic effects.

7.1.29. Describe the pharmacology of reversal and antagonist agents, and drugs used for the management of medical emergencies, including indications, duration of action and risks of use.

7.1.30. Administer sedation and analgesic drugs, titrating them to effect, taking into consideration the differing onset times, doses, peak effects and duration, to ensure completion of the entire procedure.

7.1.31. Continually monitor patient comfort and record regular observations, according to local guidelines.

7.1.32. Recognise the deteriorating patient, initiate management or rescue and call for help if required.

7.1.33. Ensure the patient is safe to be transferred to a recovery area and a formal handover of care, along with documentation of the sedation and plan for ongoing care, is completed.

7.1.34. Ensure continual observation and monitoring of the patient in the recovery area until the patient meets pre-defined criteria for discharge.

7.1.35. Ensure written discharge information is provided for all patients before they leave the facility with their carer, including instructions for steps to take in the event of an emergency.

7.1.36. Refer to the Australian and New Zealand College of Anaesthetists (ANZCA) Guidelines on Sedation and/or Analgesia for Diagnostic and Interventional Medical, Dental or Surgical Procedures.

PROCEDURAL RADIOLOGY TOPIC AREAS

General learning outcomes for procedural radiology are listed at the start of this section. In addition, further learning outcomes are provided below specific to topic areas.

The procedures and interventions a trainee is expected to be able to discuss, prepare for interpret and/or perform, relevant to the topic area, are outlined below.

As part of the procedural radiology work based assessment, trainees are required to perform and record 100 interventional procedures under radiological guidance across the three phases of training. At least 15 of each major procedure category is required, ideally maintaining an even spread across the four major categories, these are:

- Injection
- Drainage
- Biopsy
- Vascular access

These learning outcomes are in addition to the ***General Procedural Radiology*** learning outcomes listed at the start of this section.

7.2 BRAIN

By the completion of training, the trainee will be able to:

7.2.1. Discuss the indications, contraindications, limitations and potential complication and interpret, discuss and report on results of the following:

a. Diagnostic

- Cerebral angiography – catheter
- Carotid and vertebral artery angiography – catheter.

b. Therapeutic

- Carotid and vertebral artery angioplasty/stent placement
- Intracranial aneurysm repair and management of subarachnoid haemorrhage
- Intracranial vascular malformation embolisation (pial, dural)
- Emergency stroke therapy – thrombectomy / thrombolysis
- Preoperative tumour embolisation.

7.3 HEAD AND NECK

By the completion of training, the trainee will be able to:

7.3.1. Discuss the indications, contraindications, limitations and potential complications, and perform, interpret, discuss and report on results of the following:

a. Diagnostic

- Biopsy: percutaneous – lymph node, tumour
- Fluoroscopic contrast studies (e.g. contrast swallow).

b. Therapeutic

- Drainage catheter placement: percutaneous.

7.3.2. Discuss the indications, contraindications, limitations and potential complications and interpret, discuss and report on results of the following:

a. Diagnostic

- Carotid and vertebral artery angiography – catheter
- External carotid angiography
- Dacrocystogram
- Sialography.

b. Therapeutic

- Central venous catheter placement
- Carotid and vertebral artery angioplasty/stent placement
- Endovascular aneurysm/dissection/trauma repair
- Embolisation: hypervascular tumour/epistaxis
- Percutaneous vascular malformation/tumour management – venolymphatic, cystic hygroma
- Chemo-embolisation.

7.4 SPINE AND NERVOUS SYSTEM

By the completion of training, the trainee will be able to:

7.4.1. Discuss the indications, contraindications, limitations and potential complications, and perform, interpret, discuss and report on results of the following:

a. Diagnostic

- Lumbar puncture including measurement of spinal CSF pressure.

b. Therapeutic

- Percutaneous Pharmaceutical Interventions (e.g. epidural, nerve sheath, facet joint blocks)
- Drainage catheter placement: percutaneous.

7.4.2. Discuss the indications, contraindications, limitations and potential complications, and interpret, discuss and report on results of the following:

a. Diagnostic

- Myelography +/- CT
- Spinal angiography – catheter
- Biopsy: percutaneous.

b. Therapeutic

- Endovascular embolisation – preoperative tumour embolisation, vascular malformation
- Vertebroplasty / kyphoplasty
- Radiofrequency ablation (RF/RFA) and cryoablation
- Autonomic nerve blocks (e.g. Coeliac, Splanchnic, Lumbar plexus blocks or neurolysis).

7.5 CARDIOTHORACIC

By the completion of training, the trainee will be able to:

7.5.1. Discuss the indications, contraindications, limitations and potential complications and perform, interpret, discuss and report on results of the following:

a. Diagnostic

- Biopsy: percutaneous (e.g. pleural/lung/chest wall)
- Fluoroscopic contrast studies (e.g. contrast swallow).

b. Therapeutic

- Peripherally inserted central venous catheter (PICC) placement
- Drainage catheter placement: percutaneous.

7.5.2. Discuss the indications, contraindications, limitations and potential complications and interpret, discuss and report on results of the following:

a. Diagnostic

- Biopsy: transbronchial
- Cardiac angiography – catheter
- Pulmonary/bronchial angiography – catheter
- Lymphangiography.

b. Therapeutic

- Central venous catheter placement

- Balloon angioplasty/stent – aortic stent grafting
- Endovascular aneurysm repair: aortic
- Embolisation: hypervascular tumour/vascular malformation/haemoptysis
- Thrombolysis/thrombectomy: Pulmonary embolus
- Ablative (chemoembolisation, radioembolisation, radiofrequency ablation (RF/RFA), cryoablation, microwave ablation).

7.6 ABDOMEN AND PELVIS

By the completion of training, the trainee will be able to:

7.6.1. Discuss the indications, contraindications, limitations and potential complications and perform, interpret, discuss and report on results of the following:

a. Diagnostic

- Biopsy: percutaneous – solid organ (targeted or non targeted), peritoneal or retroperitonea, soft tissue
- Fluoroscopic contrast studies:
- Contrast swallow, meal, follow through, enema
- Urethrogram
- Cystogram
- Micturating cystourethrogram (MCU)
- Tubograms
- Fistulogram
- Common bariatric examinations – lap band/ sleeve/ bypass checks.

b. Therapeutic

- Drainage catheter placement – percutaneous
- Radiologically inserted nasogastric tube, nasojejunal, naso-duodenal tube.

7.6.2. Discuss the indications, contraindications, limitations and potential complications, and interpret, discuss and report on results of the following:

a. Diagnostic

- Biopsy – transvenous (liver)
- Angiography – aortoiliac, coeliac (hepatic/splenic) and mesenteric studies, renal, lumbar
- Venography
- Nephrostogram
- Cholangiogram.

b. Therapeutic

- Drainage catheter placement: trans-rectal, or trans-vaginal, abscess drainage, cholecystostomy
- Balloon angioplasty/stent – aortoiliac stent grafting
- Endovascular aneurysm repair
- Embolization: tumour (benign or malignant), haemorrhagic lesions, trauma, thoracic duct

- Inferior vena cava (IVC) filters – insertion/retrieval
- Trans-jugular intrahepatic portosystemic shunts (TIPS)
- Biliary intervention – percutaneous transhepatic cholangiography (PTC) and drainage
- Radiologically inserted gastrostomy or jejunostomy
- Stricture dilatation and stenting
- Nephrostomy
- Antegrade ureteric stent insertion
- Prostate biopsy
- Varicocele embolisation
- Ablative (chemoembolisation – hepatic, radioembolisation – hepatic , radiofrequency ablation (RF/RFA), cryoablation, microwave ablation)
- Percutaneous sclerotherapy/injection of sclerostant.

c. Dialysis related interventions (included here for convenience):

- Placement of tunnelled haemodialysis catheters
- Peritoneal dialysis catheters
- Revision/thrombolysis of poorly functioning surgically placed arteriovenous (AV) fistulas and grafts
- Fistulography.

7.7 MUSCULOSKELETAL SYSTEM

By the completion of training, the trainee will be able to:

7.7.1. Discuss the indications, contraindications, limitations and potential complications, and perform, interpret, discuss and report on results of the following:

a. Diagnostic

- Arthrography +/- CT/MRI (large/small joint)
- Biopsy: percutaneous.

b. Therapeutic

- Percutaneous Pharmaceutical Interventions - bursal (particular subacromial), large synovial joint, synovial sheaths, epidural, nerve sheath, facet joint, regional blocks (e.g. carpel tunnel)
- Drainage catheter placement: percutaneous.

7.8 PERIPHERAL VASCULAR

By the completion of training, the trainee will be able to:

7.8.1. Discuss the indications, contraindications, limitations and potential complications, and interpret, discuss and report on results of the following:

a. Diagnostic

- Catheter angiography and venography.

b. Therapeutic

- Balloon angioplasty/stent placement
- Endovascular aneurysm repair

- Endovascular or percutaneous embolisation - tumour, vascular malformation
- Endovenous laser treatment of varicose veins.

7.9 OBSTETRICS AND GYNAECOLOGY

By the completion of training, the trainee will be able to:

7.9.1. Discuss the indications, contraindications, limitations and potential complications, and perform, interpret, discuss and report on results of the following:

a. Diagnostic

- Biopsy – percutaneous.

7.9.2. Discuss the indications, contraindications, limitations and potential complications, and interpret, discuss and report on results of the following:

a. Diagnostic

- Hysterosalpingogram
- Amniocentesis
- Chorionic villus sampling
- Saline infusion sonography.

b. Therapeutic

- Fallopian tube recanalisation
- Lipiodol flush for subfertility
- Uterine artery, adenomyosis and uterine fibroid embolisation
- Drainage catheter placement – percutaneous.

7.10 BREAST

By the completion of training, the trainee will be able to:

7.10.1. Discuss the indications, contraindications, limitations and potential complications, and perform, interpret, discuss and report on results of the following:

a. Diagnostic

- US guided biopsy: percutaneous – fine-needled aspiration (FNA), core, vacuum assisted – lesion, lymph node.

b. Therapeutic

- Percutaneous aspiration – cysts/abscesses.

7.10.2. Discuss the indications, contraindications, limitations and potential complications, and interpret, discuss and report on results of the following:

a. Diagnostic

- Biopsy – percutaneous – FNA, core, vacuum assisted (stereotactic, tomosynthesis, MRI) – lesion, lymph node.

b. Therapeutic

- Hookwire insertion and other methods of localisation (e.g. radio-guided occult lesion localisation using iodine-125 seeds (ROLLIS), fiducial clips, carbon track)
- Percutaneous sclerotherapy/injection of sclerosant (i.e. for seroma).

7.11 PAEDIATRICS

By the completion of training, the trainee will be able to:

7.11.1. Discuss the indications, contraindications, limitations and potential complications, and perform, interpret, discuss and report on results of the following:

a. Diagnostic

- Fluoroscopic contrast studies:
  - GI contrast studies
  - Micturating cystourethrograms (MCU)
  - Urethrograms.

7.11.2. Discuss the indications, contraindications, limitations and potential complications, and interpret, discuss and report on results of the following:

a. Diagnostic

- Arthrography without or with CT/MRI (large/small joint)
- Biopsy – percutaneous including tumour, lymph nodes and bone
- Lumbar puncture
- Myelography without or with CT
- Cerebral and peripheral angiography – catheter (aortoiliac, coeliac (hepatic/splenic) and mesenteric studies, renal, lumbar).

b. Therapeutic

- Intussusception reduction
- Biliary intervention – PTC and drainage
- Drainage catheter placement – percutaneous, abscess drainage
- Radiologically inserted nasogastric tube, nasojejunal, naso-duodenal tube, gastrostomy or jejunostomy
- Visceral stricture dilatation and stenting
- Nephrostomy
- Antegrade ureteric stent insertion
- Dialysis related interventions – peritoneal dialysis catheters and central venous lines
- Central venous catheter placement
- Percutaneous vascular malformation/tumour management – venolymphatic, cystic hygroma – sclerosants
- Other percutaneous pharmaceutical Interventions – bursal (particular subacromial), large synovial joint, synovial sheaths, regional blocks (e.g. carpel tunnel)
- Endovascular or percutaneous embolisation - hyper-vascular tumour, vascular malformation, epistaxis
- Radiofrequency ablation (RF/RFA)
- Aneurysm repair – intracranial, aortic or peripheral artery.

Appendix 1
CLINICAL RADIOLOGY CONDITIONS LISTINGS

LEARNING OUTCOMES: CLINICAL RADIOLOGY CONDITION LISTINGS

The 2020/2021 revision of the Clinical Radiology Condition Listings is redesigned to both assist trainees in their learning and guide their assessment by supervisors and examiners. The listings have been further refined in 2022, again with the aim to consolidate and group as many conditions as possible to allow efficient and streamlined learning, limiting duplication as much as possible and clearly defining expectations. Rare or uncommon subtypes of common conditions have been listed as much as possible with their "parent" condition and these are itemised indicating that "knowing of" these rarer subtypes is only required.

As previous, the conditions in each body system have been divided into categories one, two or three in accordance with their commonality and diagnostic importance. A single document now demonstrates assignment to the general (GEN), pathology (PATH), paediatric (PAED) and key condition (KC) lists. The foetal conditions have now been amalgamated into the body system categories, again in a hope to limit topic duplication. The fetal conditions are indicated by the "F" in the paediatric column.

The genetic syndrome and multi-system conditions list for those that feature in several body systems has been expanded and rearranged to align types of conditions. As previously, each of these have mostly been removed from each of the body system lists. It should be noted that the conditions lists are not intended to represent differential diagnosis checklists.

A comprehensive understanding of the pathology is expected for those assigned to the pathology curriculum and an in-depth pathological knowledge is not expected for category 3 conditions. There are further changes also to the staging lists and requirements.

The condition listings will continue to be reviewed and refined on an annual basis to accommodate for changes in nomenclature and classification as well as to improve he utility of the document. As previous, any ongoing feedback from Fellows and trainees would be welcomed by the Clinical Radiology Curriculum and Assessment Committee.

A. GENETIC SYNDROMES / MULTI-SYSTEM CONDITIONS											
GENETIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Monosomy XO (Turner syndrome (45X))	☆		☆/F						Aicardi syndrome	☆	☆
Trisomy 13	☆		☆/F						Alagille syndrome	☆	☆
Trisomy 18	☆		☆/F						Alpha 1-antitrypsin deficiency	☆	☆
Trisomy 21	☆		☆/F						Ataxia Telangiectasia	☆	☆
Triploidy	☆		☆/F						Basal cell nevus (Gorlin) syndrome	☆	☆
									Beckwith-Wiedemann syndrome	☆	☆
									Crouzon syndrome	☆	☆
									Hereditary haemorrhagic telangiectasia	☆	☆
									Holt-Oram syndrome	☆	☆
									Joubert syndrome	☆	☆
									Maffucci syndrome	☆	☆
									McCune-Albright syndrome	☆	☆
									Meckel-Gruber syndrome	☆	☆
									Noonan's syndrome	☆	☆
									Pendred syndrome	☆	☆
									Proteus syndrome	☆	☆
									Treacher Collins syndrome	☆	☆
									Walker-Warburg syndrome	☆	☆
GENETIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Cystic fibrosis	☆	☆	☆		Heterotaxy and cardiosplenic syndromes including dextrocardia/ situs inversus	☆		☆	Goldenhar syndrome	☆	☆
					Primary Ciliary Dyskinesia (PCD) including Kartagener syndrome	☆	☆	☆	Möbius/ Poland-Möbius syndrome	☆	☆
					Pierre Robin sequence	☆		☆	Sirenomelia	☆	☆/F
					CHARGE syndrome (Coloboma, Heart defects, nasal choanae Atresia, Retardation of growth and/or development, Genital and/or urinary abnormalities, and Ear abnormalities and deafness)	☆		☆			

					CREST syndrome (Calcinosis, Raynaud's phenomenon, oEsophageal dysmotility, Sclerodactyly and Telangiectasia)	☆					
					PHACE syndrome (Posterior fossa – brain malformations, Hemangioma, Arterial lesions, Cardiac abnormalities/aortic coarctation, Eye abnormalities)	☆		☆			
					VACTERL syndrome (Vertebral defects, Anal atresia, Cardiac defects, Tracheo- esophageal fistula, Renal anomalies, and Limb abnormalities)	☆		☆			
NEOPLASTIC CONDITIONS including CARCINOGENIC MUTATIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Lymphadenopathy including nodal station classifications	☆	☆	☆		Dermoid Cyst (Pelvic, head and neck, spinal)	☆	☆	☆/F	Carney triad	☆	☆
Metastases including loco-regional, lymphatic, perineural, haematogenous, soft tissue, leptomeningeal and bone	☆	☆	☆		Paraganglioma including parasympathetic nervous system lesions - carotid body tumours, glomus jugulo/tympanicum, glomus vagale, laryngeal and extra adrenal sympathetic nervous system lesions - mediastinal, paravertebral (organ of Zuckerkandl), bladder	☆	☆	☆	Cowden syndrome	☆	☆
Squamous cell carcinoma (skin, head and neck, lung, oesophagus, cervix/vagina, urinary bladder, penis)	☆	☆			Germ cell tumours including germinoma, dysgerminoma, seminoma, embryonal carcinoma, endodermal sinus tumour (yolk sac tumour) , choriocarcinoma, teratoma and including knowledge of polyembryoma, gonadoblastoma	☆	☆	☆/F	NUT Midline Carcinoma (NMC)	☆	
Peripheral nerve sheath tumours (PNST) including schwannoma, neuroma, neurofibroma (including plexiform lesions) and malignant PNST	☆	☆	☆		Multiple Endocrine Neoplasia (MEN) types I, IIA, IIB, Familial medullary thyroid cancer (FMTC)	☆	☆	☆	Carney complex	☆	☆
Lipoma	☆	☆	☆		Li-Fraumeni syndrome	☆	☆	☆	Succinate Dehydrogenase complex subunit A (SDHA), B (SDHB), C (SDHC) and D (SDHD)	☆	☆
Haemangioma including bone	☆	☆	☆		Hereditary non–polyposis- related colorectal cancer (Lynch syndrome)	☆	☆				
Melanoma including skin, ocular, head and neck, intestinal	☆	☆									
Neuroblastoma		☆	☆/F								
BReast CAncer (BRCA) 1 and 2	☆	☆									
NEUROCUTANEOUS DISORDERS (PHAKOMATOSES)											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Neurofibromatosis 1	☆	☆	☆		von Hippel–Lindau disease	☆	☆	☆	Gorlin-Goltz syndrome	☆	☆
Neurofibromatosis 2	☆	☆	☆								
Sturge Weber syndrome	☆	☆	☆								
Tuberous sclerosis complex including Subependymal Giant Cell Astrocytoma (SEGA)	☆	☆	☆								
POLYPOSIS SYNDROMES											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
					Familial adenomatous polyposis	☆	☆	☆			
					Gardner syndrome	☆	☆				
					Juvenile polyposis	☆	☆	☆			
					Peutz-Jeghers syndrome	☆	☆	☆			
					Turcot syndrome	☆	☆	☆			
CONNECTIVE TISSUE CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Osteogenesis imperfecta	☆		☆		Ehlers-Danlos syndrome	☆	☆		Alport syndrome	☆	☆
Marfan syndrome	☆	☆	☆		Enteritis associated arthritis	☆	☆		Erdheim-Chester syndrome	☆	
Rheumatoid arthritis including knowledge of Felty syndrome	☆	☆			Psoriatic arthritis	☆			Loeys–Dietz syndrome	☆	☆
Systemic Lupus Erythematosus (SLE)	☆	☆			Scleroderma	☆	☆		Stickler syndrome	☆	☆
					Sjögren syndrome	☆	☆				

					Mixed connective tissue disease (Systemic Lupus Erythematosus (SLE), systemic sclerosis (SSc), dermatomyositis (DM), polymyositis (PM), anti-synthetase syndrome and Sjögren syndrome)	☆					
HAEMATOLOGICAL CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Haemoglobinopathies including thalasaemia and sickle cell anaemia/ disease	☆	☆	☆		Extramedullary haematopoiesis	☆	☆	☆	Haemophagocytic lymphohistiocytosis	☆	☆
Langerhans cell histiocytosis	☆	☆	☆		Iron overload including haemochromatosis and haemosiderosis	☆	☆	☆	Rosai-Dorfman disease	☆	
Lymphoma and lymphoproliferative disorders including Burkitt lymphoma, Enteropathy Associated T-cell (EATL), extra-nodal marginal zone, Mucosa-Associated Lymphoid Tissue (MALT), post transplant subtypes, cerebral intravascular and breast implant-associated large cell.	☆	☆	☆		Haemophilia	☆	☆	☆			
Plasmacytoma, multiple myeloma and other myeloproliferative disorders including myelofibrosis, Polycythaemia vera, light chain cast nephropathy and knowing of POEMS (Polyneuropathy, Organomegaly, Endocrinopathy, M protein and Skin) syndrome	☆	☆			IgG4 - related disease	☆	☆	☆			
					Leukaemia including lymphocytic and myeloid types	☆	☆	☆			
INFECTION/INFLAMMATORY CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Septicaemia	☆	☆	☆		Chronic Recurrent Multifocal Osteomyelitis (CRMO) / Chronic Non-bacterial Osteomyelitis (CNO)	☆		☆	Caffey disease	☆	☆
Tuberculosis	☆	☆	☆		Human Immunodeficiency Virus (HIV) infection / Acquired Immunodeficiency Syndrome (AIDS)	☆	☆	☆	Relapsing polychondritis	☆	
Sarcoidosis	☆	☆	☆		Inflammatory pseudotumour / inflammatory fibroblastic tumour	☆		☆			
					SAPHO syndrome (Synovitis, Acne, Pustulosis, Hyperostosis, and Osteitis)	☆		☆			
					Syphilis	☆	☆	☆			
METABOLIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Amyloidosis	☆	☆			Gaucher disease	☆		☆	Glycogen storage disorders	☆	☆
Diabetes mellitus including diabetic embryopathy	☆	☆	☆		Mucopolysaccharidosis	☆		☆			
					Scurvy	☆		☆			
VASCULAR CONDITIONS AND VASCULITIDES											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Atherosclerosis	☆	☆			Arteriovenous malformation / fistulae (cerebral including Carotid - Cavernous sinus Fistula (CCF), spinal cord, hepatic, splenic, renal, pulmonary)	☆	☆	☆	Buerger disease (thromboangiitis obliterans)	☆	
Fibromuscular dysplasia (FMD)	☆	☆			Vascular / veno-lymphatic malformation including lymphatic malformation, cystic hygroma and slow flow venous malformations	☆	☆	☆/F			
Granulomatosis with Polyangiitis (GPA)	☆	☆			Klippel-Trénaunay-Weber syndrome	☆		☆			
Polyarteritis nodosa	☆	☆	☆		Churg-Strauss syndrome	☆					
					Giant cell arteritis	☆					
					IgA vasculitis (Henoch-Schonlein purpura)	☆		☆			
					Kawasaki disease	☆		☆			
					Takayasu arteritis	☆		☆			
					Immune thrombocytopaenia	☆	☆	☆			

IATROGENIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
					Fat embolism	☆					
					Graft versus host disease	☆		☆			
					Radiation induced injury	☆	☆	☆			
					Valproate embryopathy	☆		☆			
					Warfarin embryopathy (Fetal warfarin syndrome)	☆		☆			
SYSTEMIC CONDITIONS N.O.S.											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Amniotic band syndrome	☆		☆/F								
B. BRAIN CONDITIONS											
GENERAL AND CLINICAL CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Brain swelling and oedema	☆	☆	☆	☆							
Raised intracranial pressure	☆		☆	☆							
Brain herniations and complications	☆	☆	☆	☆							
CONGENITAL											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Agenesis/dysgenesis of the corpus callosum	☆		☆/F		Anencephaly and exencephaly		☆	☆/F	Hydranencephaly	☆	☆/F
Chiari malformations	☆		☆/F		Lissencephaly and pachygyria	☆	☆	☆/F	Aprosencephaly/atelencephaly	☆	☆/F
					Grey matter heterotopia	☆	☆	☆/F	Megalencephaly including hemimegalencephaly	☆	☆/F
					Polymicrogyria	☆	☆	☆/F	Microcephaly	☆	☆/F
					Schizencephaly	☆	☆	☆/F	Cerebellar hypoplasia and vermian dysgenesis	☆	☆/F
					Holoprosencephaly spectrum including septo-optic dysplasia	☆	☆	☆/F	Rhombencephalosynapsis	☆	☆/F
					Focal cortical dysplasia	☆	☆	☆/F			
					Dandy-Walker malformation	☆	☆	☆/F			
					Encephalocoele including occipital, parietal, frontal and atretic	☆		☆/F			
CYSTIC LESIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Arachnoid cyst	☆	☆	☆/F		Choroid plexus cyst	☆	☆	☆/F	Neuroglial cyst	☆	
Colloid cyst	☆		☆		Ependymal cyst	☆		☆	Blake pouch cyst	☆	☆/F
Pineal cyst	☆		☆		Porencephalic cyst	☆		☆			
Perivascular spaces including tumefactive/ giant lesions	☆		☆								
TRAUMATIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Skull fractures and complications	☆		☆	☆	Carotid cavernous dural Arteriovenous Fistula (AVF)	☆					
Growing fracture			☆		Sequelae and chronic changes associated with brain injury including encephalomalacia and porencephaly	☆	☆	☆/F			
Cephalohaematoma			☆		Brain death	☆		☆			
Pneumocephalus	☆										
Direct parenchymal injuries (contusion, laceration)	☆	☆	☆								
Diffuse axonal / shearing injury	☆	☆	☆	☆							
Penetrating/projectile injuries	☆										
Parenchymal haemorrhage	☆	☆	☆	☆							
Epidural haematoma	☆	☆	☆	☆							
Subdural haematoma	☆	☆	☆	☆							
Subdural hygroma	☆		☆								
Traumatic subarachnoid haemorrhage	☆	☆	☆	☆							
Vascular injury (blunt/penetrating)	☆		☆								
Non-Accidental Injury (NAI) /abusive head trauma			☆	☆							

CEREBROVASCULAR CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Global/diffuse anoxia, hypoxia, ischaemia and infarction	☆	☆	☆	☆	Cavernous malformation	☆	☆	☆	Superficial siderosis	☆	☆
Neonatal encephalopathy including Hypoxic Ischaemic (HIE)			☆		Vein of Galen malformation	☆		☆/F	Cerebral Autosomal Dominant Arteriopathy with Subcortical Infarcts and Leukoencephalopathy (CADASIL)	☆	
Germinal matrix haemorrhage		☆	☆/F		Reversible Cerebral Vasoconstriction Syndrome (RCVS)	☆		☆	Capillary telangiectasia	☆	☆
Periventricular leucomalacia		☆	☆		Vasculitis/angiitis (primary/ secondary)	☆		☆	Remote cerebellar haemorrhage	☆	
Ischaemic stroke syndromes	☆	☆	☆	☆	Cerebral amyloid angiopathy	☆	☆		Sinus pericranii	☆	☆
Lacunar infarct	☆	☆			Occlusive vasculopathies including Moyamoya	☆		☆			
Atheromatous carotid stenosis	☆	☆			Focal cerebral arteriopathy	☆		☆			
Cerebrovascular atheromatous disease	☆	☆			Neurovascular conflict (e.g. trigeminal neuralgia, hemifacial spasm)	☆					
Chronic cerebrovascular insufficiency	☆	☆	☆		Developmental venous anomaly	☆		☆			
Carotid and vertebral artery dissection	☆	☆	☆								
Intracranial aneurysms (saccular, pseudo/ blood blister/ fusiform/giant)	☆	☆									
Aneurysmal subarachnoid haemorrhage	☆	☆	☆								
Subarachnoid haemorrhage related complications e.g. vasospasm	☆	☆	☆								
Perimesencephalic haemorrhage	☆	☆									
Intracerebral haemorrhage (traumatic and non-traumatic) including microhaemorrhage	☆	☆	☆/F	☆							
Hypertensive microangiopathy	☆	☆									
Border-zone/watershed infarction	☆	☆	☆	☆							
Intracranial venous thrombosis including venous sinus thrombosis and associated haemorrhage and/or venous infarction	☆	☆	☆	☆							
INFECTION / INFLAMMATORY CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Acute meningitis – bacterial/aseptic	☆	☆	☆		Gestational and Congenital infection - including TORCH (Toxoplasmosis, Rubella, Cytomegalovirus, Herpes Simplex Virus (HSV), Other (including syphilis, varicella-zoster virus, parvovirus B19, HIV and Zika virus)	☆	☆	☆/F	Amoeba	☆	
Encephalitis / cerebritis / meningoencephalitis	☆	☆	☆		Neurocysticercosis	☆	☆	☆	Rickettsia	☆	
Brain abscess	☆	☆	☆	☆	Toxoplasmosis	☆	☆		Malaria	☆	
Ventriculitis	☆		☆		Cytomegalovirus	☆	☆		Lyme disease (Neuroborreliosis)	☆	☆
Subdural empyema	☆	☆	☆	☆	Cryptococcus and other fungal infections, including angioinvasive	☆	☆	☆	Immune Restoration Inflammatory Syndrome (IRIS)	☆	
Extradural abscess	☆	☆	☆		Progressive Multifocal Leukoencephalopathy (PML)	☆	☆	☆	Human Herpes Virus (HHV) 6 encephalopathy	☆	☆
Herpes simplex virus infection	☆	☆	☆		Prion disease including Creutzfeldt Jacob Disease (CJD)	☆	☆		Parechovirus		☆
					Autoimmune encephalitis e.g. anti-myelin oligodendrocyte glycoprotein (anti-MOG) syndromes, anti-NMDA receptor encephalitis	☆		☆	Subacute Sclerosing Panencephalitis (SSPE)	☆	☆
									Rasmussen encephalitis	☆	☆
									Chronic Lymphocytic Inflammation with Pontine Perivascular Enhancement Responsive to Steroids (CLIPPERS)	☆	
DEMYELINATING CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Multiple sclerosis	☆	☆	☆						Acute Haemorrhagic Leucoencephalitis (AHLE)	☆	☆
Neuromyelitis Optica (NMO)	☆	☆	☆						Acute necrotizing encephalitis	☆	☆
Acute Disseminated Encephalomyelitis (ADEM)	☆	☆	☆								
Tumefactive and variant demyelinating conditions	☆	☆	☆								

Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Vascular dementias	☆				Alzheimer disease	☆	☆		Corticobasal degeneration	☆	
					Frontotemporal lobar degeneration	☆	☆		Amyotrophic Lateral Sclerosis (ALS)	☆	
					Parkinson disease	☆	☆		Dementia with Lewy bodies	☆	
					Multiple-System Atrophy (MSA)	☆					
					Progressive Supranuclear Palsy (PSP)	☆					
					Huntington disease	☆	☆				
TOXIC AND METABOLIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Posterior Reversible Encephalopathy Syndrome (PRES) including acute hypertensive encephalopathy	☆	☆	☆		Hypoglycaemia including neonatal hypoglycaemic encephalopathy	☆		☆	Effects of recreational drug abuse	☆	
					Osmotic demyelination	☆	☆	☆	Fahr disease	☆	☆
					Status epilepticus	☆		☆	Hyperglycaemia including diabetic striatopathy	☆	
					Carbon monoxide poisoning	☆			Genetic leukodystrophies and dysmyelinating disorders	☆	☆
					Alcohol related encephalopathies including Wernicke encephalopathy and Marchiafava-Bignami disease (MBD)	☆	☆		Inherited metabolic disorders including lysosomal, peroxisomal and mitochondrial encephalomyopathies	☆	☆
					Hepatic encephalopathy including acute hyperammonaemic encephalopathy	☆	☆		Uraemic encephalopathy	☆	☆
					Effects of chemo and immuno-therapeutic agents	☆		☆	Heavy metal poisoning	☆	
					Complications of gadolinium administration	☆		☆	Wilson disease	☆	☆
NEOPLASTIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Adult-type diffuse gliomas (astrocytoma, oligodendroglioma, glioblastoma)	☆	☆			Glioneuronal and neuronal tumours including ganglioglioma, desmoplastic infantile ganglioglioma, Dysembryoplastic Neuroepithelial Tumour (DNT), Multi Nodular and Vacuolating Tumour (MNVT), dysplastic cerebellar gangliocytoms (Lhermitte-Duclos disease) and central neurocytoma	☆	☆	☆	Calcifying Pseudo-Neoplasms Of the Neuraxis (CAPNON)	☆	
Meningioma	☆	☆	☆		Paediatric-type diffuse gliomas including diffuse astrocytoma, diffuse midline glioma	☆	☆	☆			
Adamantinomatous craniopharyngioma and papillary craniopharyngioma	☆	☆	☆/F		Ependymal tumours including ependymoma (supratentorial and posterior fossa) and subependymoma"	☆	☆	☆			
Circumscribed astrocytic glioma including pilocytic astrocytoma, pleomorphic xanthoastrocytoma and Subependymal Giant cell Astrocytoma (SEGA)	☆	☆	☆		Choroid plexus tumours including choroid plexus papilloma and choroid plexus carcinoma	☆	☆	☆/F			
Embryonal tumours including medulloblastoma and atypical teratoid/rhabdoid tumour	☆	☆			Pineal tumours including pineocytoma and pineoblastoma	☆	☆	☆			
					Solitary fibrous tumour	☆	☆				
					Haemangioblastoma	☆	☆	☆			
					Epidermoid	☆	☆	☆/F			
					Paraneoplastic syndromes (limbic, brainstem, cerebellar, spinal)	☆	☆				
					Pseudoprogression	☆	☆	☆			
					Pseudoresponse	☆	☆	☆			
PITUITARY GLAND AND SURROUNDING REGION CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Pituitary Neuroendocrine Tumors (PitNET) (micro/macroadenoma) including hyperprolactinaemia, acromegaly/giantism, Cushing disease and hypopituitism	☆	☆	☆		Diabetes insipidus	☆	☆	☆	Pituicytoma	☆	
Empty sella syndrome	☆				Inappropriate ADH secretion	☆	☆		Hamartoma of tuber cinereum	☆	
Pituitary haemorrhage and apoplexy	☆	☆			Hypophysitis	☆	☆	☆			

Sheehan syndrome (pituitary infarction)	☆	☆			Rathke cleft cyst	☆	☆	☆			
SKULL CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Craniosynostosis			☆		Hyperostosis frontalis interna	☆					
MISCELLANEOUS CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Hydrocephalus – communicating and non- communicating	☆	☆	☆/F	☆	Intracranial hypotension (including CSF leak)	☆		☆	Hypertrophic pachymeningitis	☆	
Aqueduct stenosis	☆		☆/F						Cytotoxic Lesions Of the Corpus Callosum (CLOCCs)	☆	☆
Normal pressure hydrocephalus	☆								Transient global amnesia	☆	
Complications of CSF shunts	☆		☆								
Benign Enlargement of the Subarachnoid Spaces in Infancy (BESSI)			☆								
Intracranial hypertension	☆		☆								
Mesial temporal sclerosis	☆	☆	☆								
C. HEAD AND NECK CONDITIONS											
FACIAL BONES; NASAL CAVITY; NASOPHARYNX; PARANASAL SINUSES; ANTERIOR BASE OF SKULL											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Cleft lip and palate	☆		☆/F		Encephalocele including frontoethmoidal and basal subtypes	☆		☆	Anterior neuropore anomalies		☆
Facial fractures including nasal, Le Fort/ trans-facial, zygomaxillary	☆		☆		Congenital Nasal Pyriform Aperture Stenosis (CNPAS) / Choanal atresia			☆	Rhinoscleroma	☆	
Sinonasal inflammatory disease	☆	☆	☆		Tornwaldt (Thornwaldt) cyst	☆		☆			
Fungal paranasal sinusitis including allergic and invasive subtypes, and mycetoma	☆	☆	☆		Skull base dehiscence and CSF leak	☆					
Silent Sinus Syndrome	☆				Sinonasal polyposis	☆	☆	☆			
					Antrochoanal polyp	☆	☆				
					Mucocoele of paranasal sinus	☆	☆				
					Sinonasal osteoma	☆					
					Inverting (Schneiderian) papilloma	☆	☆				
					Juvenile angiofibroma	☆	☆	☆			
					Sinonasal undifferentiated carcinoma	☆	☆				
					Adenocarcinoma	☆	☆				
					Olfactory neuroblastoma (esthesioneuroblastoma)	☆	☆	☆			
ORAL CAVITY; FLOOR OF MOUTH; SUBLINGUAL SPACE; ORO- AND HYPOPHARYNX; LARYNX; TRACHEA											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Tonsil and adenoid hypertrophy	☆		☆		Ranula including simple and plunging)	☆		☆	Laryngocele	☆	☆
Tonsillitis	☆		☆		Pharyngeal retention cyst	☆			Congenital High Airway Obstruction Syndrome (CHAOS)	☆	☆/F
Tonsillar and peritonsillar abscess	☆	☆	☆	☆	Cricopharyngeal spasm	☆			Epulis	☆	☆
Epiglottitis	☆	☆	☆	☆	Laryngeal trauma including radiation	☆			Epignathus teratoma	☆	☆/F
Croup			☆	☆	Vocal cord paresis	☆					
Retropharyngeal abscess	☆	☆	☆	☆	Acquired subglottic stenosis	☆					
Tracheal and laryngeal infection/ inflammation	☆	☆									
Pharyngeal pouch (Zenker diverticulum	☆										
Squamous cell carcinoma -p16 positive, p16 negative	☆	☆									
Inhaled and swallowed foreign bodies	☆		☆	☆							
SALIVARY GLANDS AND ASSOCIATED DUCTS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Sialadenitis	☆	☆	☆		Sialocele	☆			Acinic cell carcinoma	☆	
Sialolithiasis	☆	☆	☆		Lymphoepithelial cysts of HIV	☆					
Duct obstruction and sialoectasis	☆	☆			Adenoid cystic carcinoma	☆	☆				
Pleomorphic adenoma	☆	☆	☆		Mucoepidermoid carcinoma	☆	☆				
Warthin tumour (papillary cystadenoma lymphomatosum)	☆	☆									

DENTAL; MAXILLOFACIAL											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Mandibular fractures including body and angle, symphyseal and parasymphyseal, condylar, ramus and coronoid process	☆				Temporomandibular joint dislocation	☆			Stafne defect	☆	
Dental caries (tooth decay)	☆		☆		Temporomandibular joint dysfunction / degeneration	☆			Temporomandibular joint Pigmented Villonodular Synovitis (PVNS)	☆	
Accessory and impacted teeth	☆		☆		Temporomandibular synovial chondromatosis	☆	☆		Temporomandibular joint Calcium Pyrophosphate Dihydrate (CPPD) crystal deposition disease	☆	
Periapical cyst, granuloma and abscess	☆	☆			Odontogenic maxillary antral changes including sinusitis	☆			Odontoma	☆	
Periodontitis	☆		☆		Osteoradionecrosis	☆	☆		Ameloblastoma	☆	☆
Osteomyelitis and associated soft-tissue infection	☆	☆			Medication related osteonecrosis of the Jaw (MRONJ)	☆			Ossifying fibroma	☆	
					Tori (maxillary, mandibular) and buccal exostoses	☆	☆				
					Nasolabial cyst	☆					
					Incisive canal cyst	☆					
					Simple bone cyst	☆	☆				
					Dentigerous cyst	☆	☆				
					Odontogenic Keratocyst (OKC)	☆	☆				

EAR AND TEMPORAL BONE including CEREBELLOPONTINE ANGLE AND BASE OF SKULL											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Arachnoid granulation	☆				External ear (auditory canal) atresia	☆		☆	Labyrinth aplasia/ hypoplasia/ dysplasia including semicircular canal anomalies, common cavity malformation, and incomplete partition defect (IP 1,2, 3 (X-linkedstapes gusher syndrome))	☆	☆
Encephalocoele	☆	☆	☆		Skull base dehiscence and CSF leak	☆			Persistent stapedal artery	☆	
Lateralised/aberrant internal carotid artery	☆				Chronic oto-mastoiditis	☆	☆		Third window abnormalities including semicircular canal dehiscence, perilabyrinthine fistula, Large Endolymphatic Duct and Sac (LEDS) syndrome, dehiscence of the scala vestibuli side of the cochlea, X-linked stapes gusher, and bone dyscrasias	☆	☆
Temporal bone fractures	☆				Mucocele	☆	☆		Ecchordosis physaliphora	☆	
Acute otomastoiditis including abscess and osteomyelitis	☆	☆	☆		Labyrinthitis ossifcans	☆		☆	Tympanosclerosis	☆	☆
Apical petrositis	☆	☆			Otosclerosis/otospongiosis	☆			Medial canal fibrosis	☆	☆
Cholesteatoma (external auditory canal, middle ear, petrous apex)	☆	☆	☆		Exostosis	☆	☆		Ossicular disruption/ dislocation	☆	
					Osteoma	☆	☆		Necrotising (malignant) otitis externa	☆	
					Cholesterol granuloma	☆	☆		Viral labyrinthitis	☆	
					Chordoma	☆	☆		Haemangioma of the facial nerve	☆	
					Cochlear implant assessment	☆		☆	Intra-labyrinthine haemorrhage	☆	
									Inflammation including Ramsay-Hunt syndrome, meningitis	☆	
									Fibromatosis	☆	
									Endolymphatic sac tumour	☆	
									Post radiation therapy appearances and complications	☆	
									Keratosis obturans		

NECK: SKIN, SOFT TISSUE AND LYMPH NODES											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Branchial cleft remnants including cysts, sinus tracts and fistulae	☆	☆	☆		Benign masseteric hypertrophy	☆			Thymic cyst	☆	☆
Thyroglossal duct remnants including cysts	☆		☆		Epidermoid	☆	☆	☆	Granulomatous inflammation including Takayasu arteritis	☆	
Internal jugular vein thrombosis including Lemierre syndrome	☆	☆			Longus colli tendinitis (calcific Hydroxyapatite crystal Deposition Disease (HADD))	☆			Carotidynia	☆	
Atheromatous disease	☆	☆			Merkel cell carcinoma	☆	☆		Denervation atrophy including trigeminal and hypoglossal nerve associated	☆	
Arterial dissection – carotid and vertebral	☆				Post treatment neck	☆		☆	Castleman disease	☆	
Carotid artery injury including pseudoaneurysm	☆								Kimura disease	☆	

Deep space and superficial infection including cellulitis and abscess formation, transpatial	☆	☆	☆						Mycosis fungoides	☆	
Retropharyngeal effusion / infection	☆	☆	☆						Mastocytosis	☆	
Basal cell carcinoma	☆	☆									
THYROID GLAND											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Thyroglossal duct remnants including cysts	☆	☆	☆		Thyroiditis including Hashimoto and knowing of granulomatous (de Quervain) and Reidel types	☆	☆		Thyroid agenesis	☆	☆
Lingual thyroid	☆	☆	☆		Follicular adenoma	☆	☆				
Hyperthyroidism	☆	☆			Papillary thyroid carcinoma	☆	☆	☆			
Hypothyroidism	☆	☆			Follicular thyroid carcinoma	☆	☆	☆			
Graves disease	☆	☆			Medullary thyroid carcinoma	☆	☆				
Solitary thyroid nodule including colloid cyst	☆	☆			Anaplastic thyroid carcinoma	☆	☆				
Diffuse thyroid hyperplasia (diffuse simple goitre)	☆	☆	☆		Hurthle (oncoytic) cell tumours	☆	☆				
Multinodular thyroid hyperplasia (multinodular goitre)	☆	☆	☆								
PARATHYROID GLAND											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Hyperparathyroidism including primary, secondary and tertiary	☆	☆							Parathyroid carcinoma	☆	
Parathyroid hyperplasia	☆	☆									
Parathyroid adenoma	☆	☆									
ORBIT											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Ocular myopia	☆				Dacrocystocoele	☆		☆/F	Coloboma / staphyloma	☆	☆/F
Orbital fractures including blowout	☆				Ocular injuries including ruptured globe, dislocated lens	☆			Persistent Hyperplastic Primary Vitreous (PHPV)		☆
Retinal and choroidal detachment	☆				Optic neuritis	☆	☆		Sebaceous carcinoma	☆	
Foreign body	☆				Scleritis, episcleritis and uveitis	☆					
Orbital cellulitis	☆	☆	☆		Dacryoadenitis	☆		☆			
Abscess formation including subperiosteal	☆	☆	☆		Ocular infection including toxocariasis	☆					
Idiopathic orbital inflammation (pseudotumour)	☆	☆			Capillary haemangioma of infancy and childhood	☆	☆	☆			
Thyroid ophthalmopathy	☆				Cavernous venous malformation (haemangioma)	☆	☆				
Optic pathway glioma	☆		☆		Orbital varix	☆					
Basal cell carcinoma	☆	☆			Lacrimal gland tumours including adenocystic carcinoma	☆					
Retinoblastoma	☆	☆	☆		Phthisis bulbi	☆					
Rhabdomyosarcoma	☆	☆	☆								
D. SPINE CONDITIONS											
CONGENITAL and DEVELOPMENTAL CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Scoliosis/kyphosis including neuromuscular causes	☆		☆/F		Diastematomyelia	☆		☆/F	Iniencephaly	☆	☆/F
Vertebral formation and segmentation anomalies including Bertolotti syndrome	☆		☆/F		Craniovertebral junction anomalies including basilar invagination, atlantooccipital assimilation, os odontoideum, C1 arch defects and condylus tertius	☆		☆	Caudal regression syndrome	☆	☆/F
Spinal dysraphic disorders including lipo/ myelomeningocoele, spina bifida occulta, dorsal dermal sinus, meningocoeles (lateral, dorsal, sacral) and terminal myelocystocoele	☆	☆	☆/F		Klippel Feil spectrum	☆		☆	Neuroenteric cyst	☆	☆
Tethered spinal cord	☆		☆/F		Congenital spinal narrowing	☆		☆	Dural dysplasia/ectasia	☆	☆
Scheuermann kyphosis (Scheuermann condition, juvenile kyphosis or juvenile discogenic disease)	☆		☆		Osteopetrosis	☆		☆	Spondyloepiphyseal dysplasia	☆	☆
					Osteogenesis imperfecta	☆		☆			
					Epidermoid	☆	☆	☆			

CYSTS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Arachnoid cyst – intradural / extradural	☆				Syringomyelia	☆		☆			
Perineural cyst	☆										
TRAUMATIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Vertebral fractures including occipital condyle, Jefferson, odontoid, hangman's, burst, chance, compression, hyperflexion, hyperextension, distraction and apophyseal ring	☆		☆	☆	Rotatory atlantoaxial subluxation	☆		☆			
Stress fracture including pars interarticularis fracture	☆		☆		Ligamentous and paraspinal soft-tissue injuries	☆		☆			
Spinal fracture/dislocation	☆		☆	☆	Spinal Cord injury Without Radiographic Abnormality (SCIWORA)	☆		☆			
Atlanto-axial dislocation	☆		☆	☆	Spinal trauma related vascular injury	☆		☆			
Epidural and subdural haematoma	☆	☆	☆	☆							
Spinal cord compression	☆		☆	☆							
Spinal cord injury including contusion, haemorrhage and transection	☆	☆	☆	☆							
Disc injury/herniation	☆										
Insufficiency fracture including sacral and pedicle	☆	☆									
VASCULAR CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Spinal cord infarction	☆	☆			Non-traumatic epidural haemorrhage	☆	☆	☆	Bow Hunter Syndrome	☆	
Spinal subarachnoid haemorrhage	☆	☆	☆								
Cavernous malformations of the spinal cord	☆	☆									
INFECTION / INFLAMMATORY CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Acute pyogenic (bacterial) meningitis	☆	☆	☆						Infective myelitis including human immunodeficiency virus (HIV) and neurosyphilis	☆	
Spinal cord abscess	☆	☆							Cysticercosis	☆	
Subdural abscess	☆	☆									
Epidural abscess	☆	☆	☆								
Arachnoiditis	☆										
Osteomyelitis / discitis including pyogenic, tuberculous, granuomatous, chronic recurrent multifactorial	☆	☆	☆	☆							
Facet septic arthritis	☆	☆		☆							
NON-INFECTIVE SPONDYLOARTHROPATHIES											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Ankylosing spondylitis	☆	☆			Enteritis associated arthritis	☆	☆		Grisel syndrome	☆	☆
Diffuse Idiopathic Skeletal Hyperostosis (DISH)	☆	☆			Reactive arthritis	☆	☆				
					Juvenile idiopathic arthritis including Adult Still disease	☆	☆	☆			
DEMYELINATING CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Multiple sclerosis	☆	☆	☆						Acute and chronic demyelinating polyneuropathies	☆	☆
Neuromyelitis Optica (NMO)	☆	☆	☆								
Encephalomyelitis (ADEM)	☆	☆	☆								
Transverse myelitis	☆	☆	☆								
DEGENERATIVE CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Degenerative disc disease incl. types of disc herniation	☆	☆			Neuropathic (Charcot) spine	☆			Ossification of the ligamentum flavum	☆	
Spondylosis	☆	☆			Uncovertebral joint degeneration	☆			Baastrup disease	☆	
Spondylolisthesis	☆	☆	☆		Vertebral body osteonecrosis (Kümmell disease)	☆					

Spondylolysis	☆	☆	☆								
Facet joint arthropathy including synovial cyst	☆	☆									
Spinal stenosis	☆										
Degenerative scoliosis	☆										
Ossification of the Posterior Longitudinal Ligament (OPLL)	☆										
Postoperative changes including common types of instrumentation, complications of instrumentation/ grafting, epidural fibrosis/ scarring, adjacent segment/ accelerated degeneration, haematoma, infection, failed back syndrome	☆										
TOXIC / METABOLIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Diffuse and focal bone marrow infiltration/ replacement	☆	☆			Marrow fibrosis	☆					
Osteopenia and osteoporosis	☆	☆			Vitamin B12 deficiency	☆	☆				
Paget disease (osteitis deformans)	☆	☆			Mucopolysaccharidoses	☆		☆			
Osteomalacia and rickets	☆	☆	☆		Calcium Pyrophosphate Dihydrate (CPPD) crystal deposition disease	☆	☆				
Hyperparathyroidism	☆	☆			Gout	☆	☆				
Renal osteodystrophy	☆	☆									
NEOPLASTIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Diffuse astrocytoma (Low and high grade)	☆	☆	☆		Solitary fibrous tumour	☆	☆		Angiolipoma	☆	
Ependymoma including myxopapillary	☆	☆	☆		Haemangioblastoma	☆	☆	☆	Spinal paraneoplastic syndromes	☆	
Meningioma	☆	☆	☆		Ewing sarcoma	☆	☆	☆			
CSF tumour dissemination	☆	☆	☆		Malignant peripheral nerve sheath tumour	☆	☆	☆			
Osteoid osteoma	☆	☆	☆								
Osteoblastoma	☆	☆	☆								
MISCELLANEOUS CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Epidural lipomatosis	☆				Posterior arachnoid web	☆			Posterior epidural space oedema	☆	☆
					Ventral spinal cord herniation	☆					
E. CARDIOTHORACIC CONDITIONS											
TRAUMATIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Chest wall trauma	☆		☆	☆	Tracheobronchial laceration/rupture	☆		☆	Thoracic splenosis	☆	
Traumatic aortic injury	☆	☆	☆	☆							
Sternal/clavicular/ thoracic spine fractures and complications	☆	☆	☆								
Rib fractures including flail chest	☆		☆	☆							
Pneumothorax including non-traumatic	☆		☆	☆							
Pneumomediastinum	☆		☆								
Pneumopericardium	☆	☆	☆								
Pumonary contusion/laceration	☆	☆	☆								
Haemothorax including non-traumatic	☆	☆	☆	☆							
Haemopericardium including non-traumatic	☆	☆	☆								
Diaphragmatic rupture	☆		☆								
Oesophageal rupture/ Boerhaave syndrome	☆	☆	☆	☆							
Non-accidental injury			☆	☆							
Inhaled and swallowed foreign bodies	☆		☆	☆							
CONDUCTIVE AIRWAY CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Bronchiolitis including infectious and constrictive			☆		Tracheobronchial atresia and stenosis		☆	☆	Tracheobronchomegaly	☆	☆

Chronic obstructive pulmonary disease including asthma, chronic bronchitis and emphysema (centrilobular, paraseptal, pan lobular)	☆	☆	☆		Laryngomalacia			☆	Paratracheal cyst	☆	
Congenital Pulmonary Airway Malformation (CPAM)		☆	☆/F		Pulmonary hypoplasia/agenesis		☆	☆/F	Tracheal and bronchial anomalies including bronchial atresia	☆	☆
Broncopulmonary sequestration including extra and intralobar		☆	☆/F		Congenital lobar hyperinflation		☆	☆	Tracheobronchopathia osteochondroplastica	☆	
Allergic Broncho-Pulmonary Aspergillosis (APBA)	☆	☆	☆						Apical lung hernia	☆	☆
Bronchiectasis including knowing of Williams-Campbell syndrome	☆	☆	☆						Middle lobe syndrome	☆	☆
Atelectasis including lobar collapse	☆	☆	☆	☆					Broncholithiasis	☆	
Transient tachypnoea of the newborn			☆								
Tracheobronchiomalacia	☆		☆								
Tracheo-oesophageal fistula		☆	☆								
INFECTION / INFLAMMATORY CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Pneumonia (lobar/ bronchopneumonia) including community acquired, institutional, aspiration, neonatal and nosocomial	☆	☆	☆	☆	Parasitic infections including hydatid	☆	☆	☆			
Bacterial infections including pneumococcal, staphylococcal, klebsiella, MRSA, legionella, nocardia & actinomycosis	☆	☆	☆	☆							
Viral pneumonia including influenza, varicella, Cytomegalovirus (CMV), Severe Acute Respiratory Syndrome associated Corona Virus (SARS-CoV-2	☆	☆	☆								
Mycobacterium pneumonia including tuberculosis and nontuberculous infections	☆	☆	☆								
Fungal infections including aspergillus, candida, cryptococcosis, pneumocystis jiroveci, histoplasmosis and coccidioidomycosis	☆	☆	☆								
Mycoplasma pneumonia	☆	☆	☆								
Lung abscess	☆	☆	☆	☆							
Meconium aspiration		☆	☆								
DIFFUSE LUNG DISEASE											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Acute Respiratory Distress Syndrome (ARDS	☆	☆	☆	☆	Extrinsic allergic alveolitis (hypersensitivity pneumonitis)	☆	☆	☆	Lymphoid interstitial pneumonia	☆	
Smoking-related lung disease including Respiratory Bronchiolitis Interstitial Lung Disease (RB-ILD), Desquamative Interstitial Pneumonia (DIP), Combined Pulmonary Fibrosis and Emphysema (CPFE)	☆	☆			Lymphangioleiomyomatosis	☆	☆	☆	Pleuro-Parenchymal Fibroelastosis (PPFE)	☆	
Usual interstitial pneumonia pattern of lung disease including primary and secondary	☆	☆			Lipoid pneumonia	☆	☆		Pulmonary Alveolar Microlithiasis (PAM)	☆	
Idiopathic Pulmonary Fibrosis (IPF)	☆	☆			Alveolar lipoproteinosis (pulmonary alveolar proteinosis)	☆	☆		Metastatic pulmonary calcification	☆	
Non-Specific Interstitial Pneumonia (NSIP)	☆	☆			Pulmonary eosinophilia syndromes including simple eosinophilic pneumonia, eosinophilic granulomatosis and polyangiits (Churg- Strauss syndrome), allergic bronchopulmonary aspergillosis and drug- induced eosinophilic pneumonia	☆	☆				
Acute Interstitial Pneumonia (AIP) (diffuse alveolar damage)	☆	☆			Bronchopulmonary dysplasia (chronic lung disease of prematurity)	☆		☆			
Organising pneumonia including primary and secondary	☆	☆			Diffuse pulmonary haemorrhage	☆	☆				
Pulmonary surfactant deficiency and complications	☆		☆								
Bronchiolitis Obliterans (BO)	☆	☆	☆								

TOXIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Pulmonary fibrosis associated with smoking	☆	☆			Silo-filler's disease	☆	☆		Talcosis	☆	
Silicosis including stone worker's lung disease	☆	☆			Drug related lung damage including amiodarone toxicity	☆	☆		Hard metal pneumoconiosis	☆	
Coal worker pneumoconiosis	☆	☆							Berylliosis	☆	
Asbestos-related pleural disease including pleural plaques, mesothelioma and asbestosis	☆	☆									
PULMONARY VASCULAR CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Pulmonary vascular congestion, oedema and fluid overload	☆	☆	☆	☆	Pulmonary haemorrhage including Goodpasture syndrome, Systemic Lupus Erythematosus (SLE), Granulomatosis with Polyangiitis (GPA), idiopathic	☆	☆	☆	Swyer-James-McLeod syndrome	☆	☆
Pulmonary thrombosis and thromboembolism including acute and chronic	☆	☆	☆	☆	Septic emboli	☆	☆		Hepatopulmonary syndrome	☆	
Pulmonary infarction	☆	☆	☆						Pulmonary capillary haemangiomatosis	☆	
Pulmonary artery hypertension including knowing of pulmonary venous-occlusive disease and pulmonary capillary haemangiomatosis	☆	☆	☆						Diffuse pulmonary lymphangiomatosis	☆	
AIRWAY AND PULMONARY NEOPLASTIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Solitary pulmonary nodule	☆				Hamartoma	☆	☆		Tracheobronchial papillomatosis	☆	
Adenocarcinoma including adenocarcinoma in situ and minimally invasive adenocarcinoma	☆	☆			Pleuropulmonary blastoma			☆	Tracheal tumours (mucoepidermoid, adenocystic carcinoma)	☆	
Small cell carcinoma	☆	☆									
Large cell carcinoma	☆	☆									
Bronchial carcinoid	☆	☆									
Neuroendocrine carcinoma	☆	☆									
Lymphangitis carcinomatosis	☆	☆									
PLEURAL, DIAPHRAGM AND CHEST WALL CONDITIONS EXCLUDING TRAUMA											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Pectus excavatum	☆		☆		Diaphragmatic eventration	☆			Poland Syndrome	☆	☆
Kyphoscoliosis	☆		☆		Diaphragmatic hernia including Bochdalek, Morgagni, and congenital	☆	☆	☆/F	Ectopia cordis	☆	☆/F
Pleural effusion including transudative, exudative and malignant	☆	☆	☆		Bronchopleural fistula	☆			Sprengel deformity	☆	☆
Chylothorax	☆		☆		Diaphragmatic paralysis	☆			Solitary fibrous tumour	☆	
Thoracic empyema	☆	☆	☆		Chest wall lipoma	☆					
Pleural fibrosis and fibrothorax	☆				Elastofibroma and fibromatosis	☆					
					Chondroid tumours including chondrosarcoma	☆	☆				
HEART AND PERICARDIAL CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Cardiac failure (left and right)	☆	☆	☆	☆	Left to right shunt including atrial septal defect, ventricular septal defect and patent ductus arteriosus	☆	☆	☆/F	Takotsubo cardiomyopathy (Broken heart syndrome)	☆	
Myocardial infarction and coronary artery disease	☆	☆			Right heart malformations including Ebstein, tricuspid and pulmonary value anomalies (stenosis and atresia)	☆	☆	☆/F	Foetal arrhythmias		☆/F
Hypertensive heart disease	☆	☆			Left heart malformations including hypoplastic left heart, bicuspid aortic valve, aortic stenosis and total anomalous pulmonary venous drainage	☆	☆	☆/F			
Aortic stenosis	☆	☆	☆		Conotruncal malformations including tetralogy of Fallot, transposition of the great arteries, truncus arteriosus and double outlet right ventricle	☆	☆	☆			

Aortic valvular insufficiency	☆	☆	☆		Pulmonary circulation anomalies including proximal interruption of the pumonary artery, aberrant left pulmonary artery, partial anomalous pulmonary venous return, Scimitar syndrome (congenital pulmonary veno-lobar syndrome) and pulmonary varix	☆	☆	☆			
Mitral stenosis	☆	☆			Coronary artery aneurysm	☆	☆	☆			
Mitral valvular insufficiency	☆	☆	☆		Ventricular aneurysm	☆	☆				
Rheumatic heart disease	☆	☆	☆		Pericardial absence and defects			☆			
Infective endocarditis	☆	☆	☆		Pleuropericardial cyst	☆		☆			
Non-Bacterial Thrombotic Endocarditis (NBTE)	☆	☆			Cardiomyopathy including dilated, hypertrophic and restrictive	☆	☆	☆/F			
Pericardial effusion	☆	☆	☆		Myxoma	☆	☆				
Pericarditis and myocarditis	☆	☆	☆		Papillary fibroelastoma	☆					
					Rhabdomyoma	☆	☆	☆/F			
MEDIASTINUM AND MAJOR BLOOD VESSEL CONDITIONS (EXCLUDING TRAUMA AND GASTROINTESTINAL CONDITIONS)											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Aortic atherosclerosis including penetrating ulcer	☆	☆		☆	Thoracic systemic circulation anomalies including azygos and hemiazygos continuation of the IVC, persistent left superior vena cava, aberrant subclavian artery, right sided and double aortic arch, vascular rings/slings and aortic coarctation	☆	☆	☆	Thymic hypoplasia (di George / 22q11.2 deletion syndrome)	☆	☆/F
Thoracic aortic aneurysm including rupture	☆	☆		☆	Bronchogenic cyst	☆	☆	☆/F	Fibrosing mediastinitis	☆	
Aortic intramural haematoma	☆	☆		☆	Oesophageal duplication cyst	☆	☆	☆	Mediastinal lipomatosis	☆	
Aortic dissection	☆	☆		☆	Ectopic and retrosternal thyroid gland	☆	☆	☆			
Superior vena cava syndrome / obstruction	☆	☆			Ectopic parathyroid glands	☆	☆	☆			
					Thymus lesions including thymic ectopic and hyperplasia, thymoma, thymolipoma and thymic malignancies	☆	☆	☆			
IATROGENIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Endotracheal, intercostal tube, chest drainage tube and catheter assessment	☆		☆								
Pacemaker wire position and malposition complications	☆		☆								
In vivo line position and malposition including central lines	☆		☆								
Pulmonary interstitial emphysema	☆		☆								
Complications of prosthetic valves	☆		☆								
Thoracotomy, post surgical and post ablation appearances (including transplantation) and complications	☆		☆								
F. ABDOMINAL AND PELVIC CONDITIONS											
CLINICAL CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Gastrointestinal haemorrhage	☆	☆		☆							
OESOPHAGUS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Oesophageal atresia			☆/F		Duplication cysts	☆		☆	Epidermolysis	☆	
Oesophageal obstruction including stenosis, achalasia, web, ring and motility disorders	☆	☆	☆	☆	Diverticula including Zenker traction, pulsion and intramural pseudodiverticulosis	☆	☆		Spontaneous intramural haematoma	☆	
Oesophageal trauma including oesophageal rupture (Boerhaave syndrome	☆	☆	☆		Infective oesophagitis including candida, viral and Chaga disease	☆	☆				
Non-infective oesophagitis including gastro-oeophageal reflux disease, Barrett oesophagus, caustic, medication induced and eosinophilic	☆	☆	☆		Fibrovascular polyps	☆					
Varices	☆	☆			Leiomyoma	☆	☆				

Carcinoma	☆	☆			Post-surgical / treatment appearances and complications including radiation, NSAID use, Ivor Lewis procedures	☆					
Swallowed foreign bodies	☆		☆	☆							
STOMACH											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Pyloric stenosis	☆		☆	☆	Gastric volvulus	☆	☆	☆	Gastric diverticula	☆	
Hernia including hiatus and diaphragmatic	☆		☆		Acute gastric dilatation and gastroparesis	☆	☆		Ménétrier disease	☆	
Peptic ulcer disease	☆	☆			Leiomyoma	☆	☆		Zollinger-Ellison syndrome	☆	
Gastritis including acute, chronic and caustic	☆	☆			Neuroendocrine Tumour (NET)	☆	☆				
Stomach trauma	☆			☆	Post-surgical / treatment appearances and complications including Bilroth procedures, fundoplication, and bariatric surgery	☆					
Gastric polyps including polyposis syndromes	☆	☆									
Gastrointestinal Stromal Tumour (GIST)	☆	☆									
Carcinoma	☆	☆									
Swallowed foreign bodies including bezoar	☆										
SMALL INTESTINE											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Gastroschisis			☆/F		Enteric duplication cyst	☆		☆/F	Whipple disease	☆	
Omphalocoele			☆/F		Diverticula including duodenal, Meckel and small bowel	☆	☆	☆	Mastocytosis	☆	
Duodenal and ileal atresia			☆/F		Intestinal infections including bacterial, viral, fungal, parasitic and opportunistic organisms	☆	☆	☆	Brunner gland hyperplasia	☆	
Duodenal stenosis including webs			☆		Gluten-sensitive enteropathy (Coeliac disease)	☆	☆	☆	Intestinal scleroderma	☆	
Small bowel obstruction	☆	☆	☆	☆	Gallstone ileus	☆	☆		Intestinal angioedema	☆	
Midgut malrotation			☆	☆	Aorto-enteric fistula	☆			Primary Intestinal Lymphangiectasia (PIL)	☆	
Small intestinal intussusception	☆	☆	☆	☆	Small bowel polyps including polyposis syndromes	☆	☆		Ileocaecal valve lipoma and lipomatosis	☆	
Mesenteric adenitis	☆		☆	☆	Carcinoma	☆	☆				
Small intestinal volvulus	☆	☆	☆	☆	Neuroendocrine Tumour (NET) including carcinoid	☆	☆				
Inguinal hernia	☆		☆		Post-surgical / treatment appearances and complications including radiation enteritis, NSAID stricture	☆	☆				
Meconium ileus			☆								
Crohn disease	☆	☆	☆								
Peptic ulcer disease	☆	☆									
Small intestinal trauma	☆	☆		☆							
Intestinal ischaemia	☆	☆		☆							
Swallowed foreign bodies	☆		☆								
LARGE INTESTINE											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Microcolon			☆		Colonic atresia			☆/F	Colonic duplication		☆
Hirschsprung disease		☆	☆		Infectious colitis including typhilitis and tuberculosis	☆	☆	☆	Perivascular Epitheliod Cell tumour (PEComas)	☆	
Ileocolic intussusception			☆	☆	Epiploic appendicitis	☆		☆			
Large bowel obstruction	☆		☆	☆	Angiodysplasia	☆					
Necrotizing enterocolitis		☆	☆	☆	Rectal prolapse, ulcer and intussusception	☆					
Volvulus including caecal and sigmoid	☆	☆	☆/F	☆	Stercoral ulceration/faecal impaction	☆					
Meconium plug syndrome / small left colon			☆		Colonic fistulae	☆	☆	☆			
Colonic ileus and acute colonic pseudo- obstruction (Ogilvie syndrome)	☆		☆								
Large intestinal trauma	☆	☆	☆								
Ischaemia including ischaemic colitis	☆	☆	☆	☆							

Inflammatory bowel disease including ulcerative and infective colitis	☆	☆	☆								
Toxic megacolon	☆	☆	☆								
Diverticular disease and complications including diverticulitis	☆	☆		☆							
Colonic polyps including villous and polyposis syndromes	☆	☆									
Colorectal carcinoma	☆	☆									
Foreign bodies	☆		☆								
APPENDIX											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Appendicitis	☆	☆	☆	☆	Neuroendocrine Tumour (NET)	☆	☆		Low-grade Appendiceal Mucinous Neoplasm (LAMN)	☆	
					Appendiceal mucocele	☆	☆	☆			
ANUS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
					Anal atresia			☆/F			
					Perianal sepsis including fistula	☆	☆	☆			
LIVER, GALLBLADDER AND BILE DUCTS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Hepatitis including viral, autoimmune, drug related, alcoholic and neonatal	☆	☆	☆		Congenital abnormalities of the biliary system including atresia, gall bladder aplasia / hypoplasia and bile duct variants	☆	☆	☆	Congenital absence of hepatic segments	☆	☆
Cholelithiasis and choledocholithiasis including Mirizzi syndrome	☆	☆	☆/F		Fibropolycystic liver disease including congenital hepatic fibrosis, biliary hamartomas including von Meyenburg complex (VMC), autosomal dominant polycystic disease, Caroli disease and choledochal cysts	☆	☆	☆/F	Persistent right umbilical vein		☆/F
Cholecystitis including acute calculous, acute acalculous, chronic, xanthogranulomatous, emphysematous and empyema	☆	☆	☆	☆	Nodular regenerative hyperplasia	☆			HIV Cholangiopathy	☆	
Cholangitis including primary, sclerosing and recurrent pyogenic cholangitis (oriental cholangiohepatitis) and autoimmune (IgG4).	☆	☆		☆	Hydatid disease	☆	☆		Hepatic schistosomiasis and other parasitic diseases	☆	
Hepatic failure including acute and chronic	☆	☆			Abscess including pyogenic, tuberculous, fungal and amoe bic	☆	☆		Solitary Necrotic Nodule of the Liver (SNNL)	☆	
Cirrhosis including primary biliary cirrhosis and focal confluent fibrosis	☆	☆	☆		Mucocele (hydrops) of the gallbladder	☆			Vascular malformation including arterial- portal shunts	☆	☆
Fatty liver disease (steatosis) including alcoholic, nonalcoholic, atypical focal fat and focal fatty sparing	☆	☆			Veno-occlusive disease including Budd Chiari syndrome (thrombosis)	☆	☆	☆	Mesenchymal hamartoma		☆/F
Portal venous hypertension	☆	☆			Ischaemic cholangiopathies	☆			Hepatic disease associated with pregnancy including hyperemesis gravidarum, intrahepatic cholestasis of pregnancy, acute fatty liver of pregnancy and preeclampsia, eclampsia, and HELLP (hemolysis, elevated liver enzymes, low platelet count) syndrome	☆	
Portal vein thrombosis / occlusion including cavernous transformation (portal cavernoma) and portobiliopathy	☆	☆	☆		Hepatocellular adenoma	☆	☆	☆/F	Peliosis hepatis	☆	
Hepatic trauma	☆	☆	☆	☆	Gallbladder polyps including biliary papillomatosis	☆	☆		Biliary perforation including gallbladder and spontaneous common bile duct, and biloma	☆	☆
Hepatic cysts including peribiliary cysts	☆	☆			Hyperplastic cholecytosis (adenomyomatosis) of the gall bladder	☆	☆		Bile-plug syndrome	☆	☆
Hepatic haemangioma including knowing of congenital haemangioma, haemangiomatosis and sclerosing haemangioma	☆	☆	☆/F		Biliary cystadenoma	☆	☆		Hepatic infarct	☆	
Focal nodular hyperplasia	☆	☆	☆		Liver transplant workup, appearances and complications	☆	☆		Hereditary hemorrhagic telangiectasis	☆	

Hepatocellular carcinoma including fibrolamellar	☆	☆			Post- treatment/surgical appearances and complications including Trans-jugular Intrahepatic Portosystemic Shunt (TIPS), ablation / Stereotactic Ablative Radiotherapy (SABR), segmental resection and chemotherapy induced cholangitis	☆	☆		Wilson disease	☆	
Cholangiocarcinoma including gall bladder and ampulllary	☆	☆			Hepatic mesenchymal lesions including inflammatory pseudotumor, lipoma, angiolipoma, angiomyolipoma, epithelioid hemagioendothelioma, malignant fibrous histiocytoma, leiomyosarcoma, and follicular dendritic cell sarcoma	☆	☆/F		Angiosarcoma	☆	
Hepatoblastoma	☆	☆	☆/F						Mucinous Cystic Neoplasm of the Liver (MCN-L) and Bile duct (IPMN- B)	☆	
PANCREAS AND AMPULLA OF VATER											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Pancreatitis including acute and chronic including pseudocysts and other complications, including knowing of groove and autoimmune pancreatitis	☆	☆	☆	☆	Pancreas divisum	☆	☆	☆	Congenital anomalies including agenesis, ectopic pancreatic tissue and asymmetric lobulation	☆	☆
Pancreatic trauma	☆	☆	☆	☆	Annular pancreas	☆		☆	Pancreatic lipomatous pseudohypertrophy	☆	☆
Ductal adenocarcinoma	☆	☆			Non-neoplastic cysts	☆	☆	☆	Acinar cell carcinoma	☆	
Serous cystic neoplasm	☆	☆			Intraductal papillary mucinous neoplasm of the pancreas (IPMN)	☆	☆		Pancreaticoblastoma	☆	☆
Mucinous cystic neoplasm	☆	☆			Solid pseudopapillary neoplasm (SPPN)	☆	☆	☆			
Neuroendocrine Tumour (NET)	☆	☆	☆		Ampullary carcinoma	☆	☆				
Post-surgical appearances and complications including transplantation	☆	☆	☆								
KIDNEY AND UPPER URINARY TRACT											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Renal anomalies including agenesis, ectopic, horseshoe, duplex and crossed fused ectopic	☆	☆	☆/F		Nephroblastomatosis	☆	☆	☆	Renal lymphangiomatosis	☆	☆
Renal collecting system duplication	☆		☆/F		Nephrotic and nephritic syndromes	☆	☆		Thrombotic microangiopathies including hemolytic uremic syndrome and thrombotic thrombocytopenic purpura	☆	☆
Foetal renal collecting system dilatation			☆/F		Glomerulonephritis	☆	☆	☆	Paroxysmal nocturnal haemoglobinuria	☆	
Pelviureteric junction obstruction	☆		☆/F		Nephrosclerosis	☆	☆		Urate nephropathy	☆	
Multicystic dysplastic kidney	☆	☆	☆/F		Nephrocalcinosis	☆	☆	☆	Analgesic nephropathy	☆	
Acute tubular injury/necrosis	☆	☆	☆		Arteriovenous fistula including iatrogenic	☆			Lithium nephropathy	☆	
Diffuse (acute) cortical necrosis	☆	☆	☆		Renal artery stenosis including fibro- muscular dysplasia	☆	☆		Renal lipomatosis	☆	
Renal papillary necrosis	☆	☆	☆		Renal artery aneurysm	☆	☆		Metanephric adenoma	☆	
Pyelonephritis including acute and chronic, xanthogranulomatous and emphysematous	☆	☆	☆	☆	Renal vein thrombosis	☆			Mixed epithelial and stromal tumour	☆	
Renal abscess and pyonephrosis	☆	☆	☆		Medullary sponge kidney	☆	☆	☆			
Renal trauma including renovascular injury and urinoma	☆		☆/F	☆	Autosomal recessive (childhood) polycystic kidney disease	☆	☆	☆/F			
Renal infarct	☆	☆	☆	☆	Multilocular cystic nephroma	☆		☆			
Urolithiasis and nephrocalcinosis	☆	☆	☆	☆	Oncocytoma	☆	☆				
Simple renal cysts including peripelvic and parapelvic	☆	☆	☆		Angiomyolipoma	☆	☆	☆			
Autosomal dominant (adult) polycystic kidney disease	☆	☆	☆		Mesoblastic nephroma	☆		☆/F			
Acquired (dialysis-associated) cystic disease	☆	☆			Renal transplant work-up	☆		☆			
Renal cell carcinoma including clear cell, papillary, chromophore, medullary and clear cell papillary	☆	☆			Post- treatment/surgical appearances and complications including post transplantation, ablation procedures and radiation nephritis	☆		☆			
Wilms Tumour (nephroblastoma)		☆	☆								
Urothelial (transitional cell) carcinoma	☆	☆									
Contrast media induced nephrotoxicity	☆										

Chronic and end-stage kidney disease	☆										
LOWER URINARY TRACT INCLUDING THE PENIS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Hydronephrosis	☆		☆		Anomalies including double/bifid/ ectopic ureter, ureterocoele, primary megaureter, ureteric diverticula, bladder extrophy, and urachal anomalies	☆		☆/F	Malacoplakia	☆	
Bladder outlet obstruction / Lower Urinary Tract Obstruction (LUTO) including posterior urethral valves / congenital obstructing posterior urethral membranes (COPUM)	☆		☆/F		Cloacal malformation (extrophy) / urogenital sinus including knowing of OEIS (Omphalocele-cloacal Exstrophy- Imperforate anus-Spinal defect) syndrome	☆		☆/F	Nephrogenic adenoma	☆	
Vesico-ureteric reflux			☆		Fistulae associated with inflammatory bowel disease	☆	☆		Leiomyoma	☆	
Vesico-ureteric junction obstruction	☆		☆		Ureteritis including ureteritis cystica	☆	☆		Urachal adenocarcinoma	☆	☆
Cystitis including knowing of cystitis cystica, cystitis glangularis and eosinophilic cystitis	☆	☆		☆	Inflammatory pseudotumor (pseudosarcomatous fibromyxoid tumor)	☆	☆		Squamous cell carcinoma of the penis	☆	
Urethritis	☆	☆			Polyps including ureteric fibroepithelial polyp	☆	☆		Penis erectile dysfunction	☆	
Renal collecting system trauma	☆	☆	☆	☆	Carcinoma	☆	☆		Penile fracture	☆	
Urethral stricture and diverticulum	☆		☆		Rhabdomyosarcoma	☆	☆	☆	Peyronie disease	☆	
Ureteric and bladder calculi	☆	☆	☆		Post- treatment/surgical appearances and complications including radiotherapy and chemotherapy cystitis	☆	☆	☆			
Neurogenic bladder	☆	☆	☆								
Bladder diverticulum	☆		☆								
Urothelial (transitional cell) carcinoma	☆	☆									
SCROTUM, TESTIS AND EPIDIDYMIS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Cryptorchidism	☆		☆		Pyocoele	☆	☆		Gonadal dysgenesis	☆	☆
Epididymitis	☆	☆	☆		Epididymal cyst	☆	☆		Tubular ectasia of the rete testis	☆	
Orchitis	☆	☆	☆		Spermatocoele	☆	☆		Epidermoid	☆	
Hydrocoele	☆	☆	☆		Adenomatoid tumour	☆	☆		Testicular microlithiasis	☆	☆
Scrotal/testicular trauma including haematocoele	☆	☆	☆	☆	Spermatocytic tumour	☆	☆				
Torsion including testis and testicular appendage, and segmental infarction	☆		☆	☆	Sex cord-gonadal stromal tumours	☆	☆				
Varicocoele	☆	☆									
Inguinal hernia	☆	☆	☆								
PROSTATE AND SEMINAL VESICLE											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Prostatitis	☆	☆							Seminal vesicle agenesis	☆	
Prostatic abscess	☆								Seminal vesicle cyst	☆	
Prostate cyst	☆								Seminal vesicle cystadenoma	☆	
Benign prostatic (nodular) hyperplasia	☆	☆							Seminal vesicle carcinoma	☆	
Carcinoma	☆	☆							Seminal vesicle calculi	☆	
ADRENAL GLAND											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Adrenal trauma	☆			☆	Secondary adrenal hyperplasia	☆	☆		Congenital adrenal hyperplasia (adrenogenital syndrome)	☆	☆/F
Non traumatic adrenal haemorrhage including Waterhouse- Friderichsen syndrome	☆	☆	☆/F		Myelolipoma	☆	☆				
Hypercortisolism (Cushing syndrome)	☆	☆			Addison disease	☆	☆	☆			
Primary hyperaldosteronism (Conn syndrome)	☆	☆									
Adrenal cortical insufficiency	☆	☆									
Adrenal adenoma	☆	☆									
Adrenal carcinoma	☆	☆									
Phaeochromocytoma	☆	☆	☆								

SPLEEN											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Splenunculus	☆		☆		Asplenia/polysplenia	☆		☆/F	Sclerosing Angiomatoid Nodular Transformation (SANT)	☆	
Splenomegaly and hypersplenism	☆		☆		Splenic infection and abscess	☆	☆		Angiosarcoma	☆	
Splenic rupture including traumatic, spontaneous and delayed	☆	☆	☆	☆	Polycythaemia vera	☆	☆		Inflammatory myofibroblastic tumour (pseudotumour)	☆	
Splenic infarct	☆			☆	Splenic siderosis	☆	☆				
Splenic cysts	☆										
PERITONEUM / MESENTERY INCLUDING ABDOMINAL WALL AND CAVITY											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Ascites	☆	☆	☆	☆	Abdominal Cystic Lymphangiomas (ACLs) (mesenteric cystic lymphangioma)	☆		☆/F	Prune-belly syndrome	☆	☆/F
Trauma including mesenteric injury, haemoperitoneum and diaphragmatic rupture	☆			☆	Mesenteric panniculitis	☆	☆		Pentalogy of Cantrell (POC)	☆	☆/F
Pneumoperitoneum	☆		☆	☆	Mesothelioma	☆	☆		Body stalk anomaly	☆	☆/F
Peritonitis including tuberculosis	☆	☆			Post- operative appearances and complications	☆			Sclerosing mesenteritis	☆	
Meconium peritonitis including pseudocysts	☆	☆	☆/F		Omental infarct	☆			Sclerosing encapsulating peritonitis	☆	
Intraabdominal abscess	☆	☆	☆	☆	Desmoid tumour (fibromatosis)	☆			Splanchnic artery aneurysm	☆	
Porto-systemic varies	☆	☆	☆						Segmental arterial mediolysis	☆	
Internal hernia including paraduodennal, transmesenteric, postoperative, Bochdalek and Morgagni.	☆								Peritoneal inclusion cyst	☆	☆
External hernia including inguinal, femoral, obturator, ventral, Spigelian, lumbar, umbilical and traumatic abdominal wall	☆										
Pseudomyxoma peritonei	☆	☆									
RETROPERITONEUM											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Retroperitoneal trauma	☆			☆	Inferior vena cava anomalies including duplications	☆		☆	Arteriovenous fistula	☆	
Aortic atherosclerosis, aneurysm, pseudoaneurysm, dissection and rupture	☆	☆		☆	Retroperitoneal fibrosis	☆	☆		Segmental arterial mediolysis	☆	
Aorto-iliac occlusion	☆	☆		☆	Coeliac artery, Superior Mesenteric Artery (SMA), or Inferior Mesenteric Artery (IMA) compression syndromes (intestinal angina)	☆	☆	☆	Pelvic lipomatosis	☆	
Aortoenteric fistula	☆	☆			Post- treatment appearances and complications including haemorrhage, aortic endoleak and lymphocoele development	☆	☆	☆			
Retroperitoneal sarcoma including knowing of leiomyosarcoma, liposarcoma, Ewing sarcoma, synovial sarcoma and solitary fibrous tumour	☆	☆	☆								
Inferior vena cava obstruction including knowing of May–Thurner Syndrome (MTS)	☆	☆									
G. MUSCULOSKELETAL CONDITIONS											
CONGENITAL AND DEVELOPMENTAL CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
					Achondroplasia	☆		☆/F	Achondrogenesis and hypochondrogenesis	☆	☆/F
					Cerebral palsy	☆		☆	Akinesia/hypokinesia sequence including arthrogryposis	☆	☆
					Cleidocranial dysplasia	☆		☆	Asphyxiating thoracic dystrophy (Jeune syndrome)	☆	☆/F
					Fong Disease (Nail-Patella syndrome)	☆		☆	Atelosteogenesis	☆	☆/F
					Hypochondroplasia	☆		☆	Campomelic dysplasia	☆	☆/F
					Melorheostosis	☆		☆	Chondrodysplasia punctata	☆	☆
					Muscular dystrophy	☆		☆	Chondroectodermal dysplasia (Ellis-van Creveld)	☆	☆
					Ollier disease	☆		☆	Congenital Pseudarthrosis of the Tibia (CPT)	☆	☆
					Osteopetrosis	☆		☆	Dysplasia Epiphysealis Hemimelica (DEH) (Trevor-Fairbank disease)	☆	☆

					Osteopoikilosis	☆		☆	Fibrodysplasia Ossificans Progressiva (FOP)	☆	☆
									Intramedually osteosclerosis	☆	☆
									Mastocytosis	☆	☆
									Progressive epiphyseal dysplasia	☆	☆
									Pseudoachondroplasia	☆	☆
									Pycnodystosis	☆	☆
									Spondyloepiphyseal dysplasia congenita	☆	☆
									Split hand/foot malformation	☆	☆/F
									Thanatophoric dwarfism	☆	☆/F
TRAUMATIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Bone bruising	☆		☆		Morel-Lavallée lesion	☆					
Fracture including greenstick, bowing, Salter- Harris, buckle, torus, pathological, delayed union and non-union with assessment of stability	☆		☆	☆							
Insufficiency fracture	☆		☆								
Avulsion injury including epiphyseal, apophyseal and physis lesions	☆		☆								
Osteochondral defect	☆		☆								
Muscle and tendon tear/rupture	☆		☆								
Ligamentous injury including assessment of stability	☆		☆								
Subluxation and dislocation including assessment of stability	☆		☆	☆							
Fracture - dislocation including Monteggia, Galeazzi, Lisfranc injuries with assessment of stability	☆		☆	☆							
Joint effusion	☆		☆								
Lipohaemarthrosis	☆		☆								
Non-accidental injury			☆	☆							
Haematoma	☆										
Foreign bodies	☆		☆								
VASCULAR AND HAEMATOLOGICAL CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Increased bone marrow cellularity	☆										
Diffuse and focal bone marrow infiltration/ replacement	☆		☆								
Bone marrow fibrosis	☆										
Avascular necrosis	☆	☆	☆								
Bone infarct	☆	☆	☆								
INFECTION / INFLAMMATORY CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Osteomyelitis including acute and chronic	☆	☆	☆	☆	Congenital infection including rubella and syphilis	☆	☆	☆	Brucellosis	☆	
Bursitis	☆								Leprosy	☆	
Tenosynovitis	☆								Polio	☆	
Necrotising fasciitis	☆	☆							Fungal infections including Madura foot	☆	
Infectious arthritis including suppurative (septic)	☆	☆	☆	☆					Rickettsial infections and related infections including Lyme disease and Rocky Mountain spotted fever	☆	
									Parasitic infections	☆	
NON-INFECTIVE SPONDYLOARTHROPATHIES AND INFLAMMATORY CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Ankylosing spondylitis	☆	☆			Juvenile idiopathic arthritis including Adult Still disease	☆	☆	☆			
Diffuse idiopathic skeletal hyperostosis	☆				Progressive systemic sclerosis	☆					
					Inflammatory myopathy	☆					

DEGENERATIVE CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Osteoarthritis	☆	☆			Denervation myopathy	☆					
Neuropathic (Charcot) joint	☆	☆			Osteitis condensans ilii	☆					
					Ganglion and synovial cysts	☆	☆				

TOXIC / METABOLIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Osteopenia and osteoporosis including disuse and idiopathic juvenile	☆	☆	☆		Hyperthyroidism including knowing of thyroid acropachy	☆	☆		Heavy metal poisoning including lead	☆	☆
Paget disease (osteitis deformans)	☆	☆			Hypothyroidism	☆	☆		Homocysteinuria	☆	
Osteomalacia	☆	☆	☆		Hypoparathyroidism, pseudo- and pseudopseudohypoparathyroidism	☆	☆		Hypophosphatasia	☆	☆/F
Rickets		☆	☆		Osteoradionecrosis	☆	☆	☆	Ochronosis	☆	
Renal osteodystrophy	☆	☆	☆		Drug induced complications including alcohol, vitamins A and D, fluoride, retinoid, warfarin, voriconizole, biphosphonates and fluoroquinolone	☆	☆	☆	Oxalosis	☆	☆
Gout	☆	☆							Tumoural (idiopathic) calcinosis	☆	
Calcium pyrophosphate crystal deposition disease	☆	☆									
Hydroxyapatite crystal deposition disease	☆	☆									
Transient bone marrow edema syndrome (BMES) including transient osteoporosis of the hip (TOH), regional migratory osteoporosis (RMO), and reflex sympathetic dystrophy (RSD)	☆										

NEOPLASIA AND TUMOUR LIKE CONDITIONS OF BONE AND SOFT TISSUE											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Simple (unicameral) bone cyst	☆	☆	☆		Nodular fasciitis	☆	☆		Adamantinoma	☆	☆
Myositis ossificans	☆	☆	☆		Pigmented villonodular synovitis (PVNS) - joint and tendon sheath	☆	☆		Angiosarcoma	☆	☆
Chondroma including intra-articular and periosteal	☆	☆	☆		Chondromyxoid fibroma	☆	☆	☆	Desmoplastic fibroma	☆	
Enchondroma including knowing of Ollier disease	☆	☆	☆		Chondroblastoma	☆	☆	☆	Elastofibroma	☆	
Chondrosarcoma including knowing of dedifferentiated, periosteal and clear cell	☆	☆	☆		Chordoma	☆	☆		Haemangioendothelioma	☆	☆
Fibrous dysplasia	☆	☆	☆		Fibromatosis	☆	☆	☆	Kaposi sarcoma	☆	
Non-ossifying fibroma and fibrous cortical defect	☆	☆	☆		Fibrosarcoma including myxofibrosarcoma	☆	☆		Liposclerosing myxofibrous tumors (LSMFT) (polymorphic fibro-osseous lesions of bone)	☆	
Lipoma and atypical lipomatous tumour including knowing of intraosseous, lipomatoses, macrodystrophica lipomatosa, lipoma arborescens, hibernoma and liposarcoma	☆	☆			Extrapleural solitary fibrous tumour/ haemangiopericytoma	☆	☆		Malignant fibrous histiocytoma of bone	☆	
Osteoma including osteoid osteoma	☆	☆	☆		Rhabdomyoma	☆			Multicentric reticulohistiocytosis (MRH)	☆	
Osteoblastoma	☆	☆	☆		Leiomyoma and leiomyosarcoma	☆			Osteofibrous dysplasia	☆	
Osteochondroma including knowing of the osteochromatoses, synovial osteochondromatosis (primary and secondary) and diaphyseal aclasis	☆	☆	☆		Synovial sarcoma	☆	☆		Perineurioma	☆	
Osteosarcoma including parosteal, periosteal, and telangiectatic	☆	☆	☆		Undifferentiated pleomorphic sarcoma	☆	☆				
Rhabdomyosarcoma	☆	☆	☆		Hypertrophic osteoarthropathy	☆					
Ewing sarcoma	☆	☆	☆								
Giant cell tumour of bone	☆	☆	☆								
Aneurysmal bone cyst	☆	☆	☆								

SPECIFIC UPPER LIMB CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Glenohumeral dislocations	☆		☆		Shoulder instability including labral lesions including Bankart, Anterior Labroligamentous Periosteal Sleeve Avulsion (ALPSA), Glenolabral Articular Disruption (GLAD), Humeral aAvulsion of the Glenohumeral Ligament (HAGL), SLAP (Superior Labrum from Anterior to Posterior) tear and denervation syndromes	☆			Sternocostoclavicular hyperostosis (SCCH)	☆	
Labral injuries	☆				Labral cysts	☆			Parsonage-Turner syndrome	☆	
Rotator cuff tendinopathies and tears	☆				Glenoid hypoplasia	☆		☆	Hypothenar hammer syndrome	☆	
Shoulder impingement	☆				Neuropathic (Charcot) shoulder	☆			Hand extensor hood and pulley injuries	☆	
Clavicle and associated joint injuries	☆				Biceps tendon injuries of the shoulder	☆			Radial ray anomalies	☆	☆/F
Adhesive capsulitis	☆				Elbow fractures and/or dislocation including collateral ligament injury	☆			Short-rib polydactyly syndrome	☆	☆/F
Medial and lateral epicondylitis of the elbow	☆				Elbow tendon, synovial and bursal injuries	☆					
Forearm, wrist and hand fractures, and / or dislocations	☆		☆		Neural impingement syndromes including carpel tunnel, Guyon's canal and quadrilateral space syndromes	☆					
Madelung deformity	☆		☆		Carpal instability	☆					
Ulnar variance	☆				Distal Radioulnar Joint (DRUJ) instability and ulnar abutment	☆					
Scapholunate ligament tear	☆				Avascular necrosis (e.g. scaphoid, lunate)	☆	☆				
Triangular Fibrocartilage Complex (TFCC) injuries	☆				Post-surgical / treatment appearances and complications including implant, arthroplasty and arthrodesis	☆		☆			
Ganglion cyst of the wrist	☆										
Flexor and extensor tendon injuries of the digits	☆										
Polydactyly, syndactyly and clinidactyly	☆		☆/F								

SPECIFIC LOWER LIMB CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Developmental dysplasia of the hip (DDH)			☆		Coxa vara	☆			Proximal femoral focal deficiency	☆	☆/F
Avascular necrosis / osteonecrosis including Legg-Calve-Pethes and Köhler diseases	☆		☆		Iliotibial band syndrome	☆			Snapping hip syndromes	☆	
Slipped capital femoral epiphysis (SCFE)			☆		Femoro-acetabular impingement	☆		☆	Piriformis syndrome	☆	
Actabular and other pelvic injuries including pelvic ring disruptions, avulsion and stress injuries	☆		☆		Ishiofemoral impingement	☆			Ligamentum teres injury	☆	
Acetabular labral tears including femoroacetabular impingement, osteo/ chondral defects	☆		☆		Sinding-Larsen-Johansson disease	☆		☆	Plica syndromes	☆	
Transient synovitis (irritable hip)	☆		☆		Patella sleeve avulsion				Fat pad impingement (Hoffa syndrome)	☆	
Proximal femoral fractures and hip dislocation	☆				Knee extensor mechanism injuries	☆			Pes anserine bursitis	☆	
Hip abductor, flexor adductor injuries and trochanteric bursitis	☆				Blount disease	☆		☆	Accessory ossification centre syndromes of the foot and ankle	☆	
Quadriceps and patellar tendon injury	☆				Neuropathic (Charcot) foot	☆	☆		Sever's disease (apophysitis of the calcaneus)	☆	☆
Meniscal injuries of the knee including tears, associated meniscal cysts, the discoid meniscus, meniscal ossicles and popliteomeninscal fascicle injury	☆		☆		Sinus tarsi and tarsal tunnel syndrome	☆			Congenital vertical talus (rocker-bottom foot)	☆	☆
Knee cruciate and collateral ligament injury and repairs	☆		☆		Plantar fasciitis / plate rupture	☆			Turf toe	☆	
Posterolateral and posteromedial corner injury	☆		☆		Hallux valgus and metatarsus primus varus including Bunionette formation	☆			Amelia, phocomelia and fibula/tibial hemimelia	☆	☆/F
Fracture and/or dislocation of the tibiofemoral and tibiofibula joints including chondral injuries	☆		☆		Hallux rigidus	☆			Rocker bottom and sandal gap foot	☆	☆/F
Patellar instability, fracture and dislocations	☆		☆		Pes cavus and planus (flat foot)	☆		☆			

Baker's cyst (popliteal cyst)	☆				Post-surgical / treatment appearances and complications including implant, arthroplasty, meniscal repair and arthrodesis	☆		☆			
Osgood–Schlatter Disease (OSD)	☆		☆								
Toddler's fracture	☆		☆								
Achilles tendon injuries and tendinosis including Haglund syndrome	☆										
Medial and lateral ankle ligament injury and ankle instability	☆										
Ligament and musculotendinous injuries of the ankle and foot including plantar fasciitis and Achilles tendon tears and tendinopathy	☆										
Tarsal coalition	☆		☆								
Morton's neuroma	☆										
Fracture and/or dislocation of the ankle and foot including malleolar, ostochondral, calcanea, tarsus and Lisfranc injuries	☆		☆								
Stress fracture of the leg, ankle and foot	☆										
Talipes Equinovarus (TEV)			☆/F								
H. BREAST CONDITIONS											
DEVELOPMENTAL CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
									Milk line remnants	☆	
									Accessory axillary breast tissue	☆	
									Pectoralis muscle variants including Poland syndrome	☆	☆
									Sternalis syndrome	☆	☆
INFECTION / INFLAMMATORY CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Acute mastitis	☆	☆			Diabetic mastopathy	☆	☆		Granulomatous lobular mastitis	☆	
Abscess	☆	☆									
Mammary duct ectasia	☆	☆									
TRAUMATIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Haematoma and fat necrosis including seatbelt injury	☆	☆									
VASCULAR CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
									Mondor disease	☆	
									Vascular malformations	☆	
BENIGN EPITHELIAL CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Fibrocystic change including cysts	☆	☆			Sclerosing adenosis	☆	☆		Juvenile papillomatosis	☆	
Apocrine metaplasia of the breast	☆	☆									
Radial scar / complex sclerosing lesion	☆	☆									
LOBULAR NEOPLASTIC CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Atypical lobular hyperplasia and lobular carcinoma-in-situ	☆	☆									
Invasive lobular carcinoma including pleomorphic subtype	☆	☆									
INTRADUCTAL PROLIFERATIVE CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Usual ductal hyperplasia	☆	☆			Mucocoele-Like Lesions (MLL)	☆					
Columnar Cell Lesions (CCLs) of the breast	☆	☆									
Atypical ductal hyperplasia	☆	☆									
Ductal Carcinoma-In-Situ (DCIS)	☆	☆									

INTRADUCTAL PAPILLARY CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Intraductal papilloma including large (central), small duct (peripheral) and atypical lesions	☆	☆			Papillary carcinoma including encapsulated (encysted), intracystic and solid lesions	☆	☆				
NEOPLASTIC EPITHELIAL CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Invasive Ductal Carcinoma (IDC)/Invasive breast carcinoma, not otherwise specified (NOS) including Tumour- Infiltrating Lymphocyte (TIL) lesions	☆	☆			Paget disease of the nipple	☆	☆		Adenoma including tubular and lactating	☆	
					Tubular carcinoma	☆	☆		Metaplastic carcinoma	☆	
					Mucinous (colloid) carcinoma	☆	☆		Adenoid cystic carcinoma	☆	
MESENCHYMAL CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
					Pseudoangiomatous Stromal Hyperplasia (PASH)	☆	☆				
FIBROEPITHELIAL CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Fibroadenoma	☆	☆			Phyllodes tumour	☆	☆				
Hamartoma (fibroadenolipoma)	☆	☆									
OTHER MALIGNANT CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
					Inflammatory breast carcinoma	☆			Sarcoma including post-radiotherapy angiosarcoma	☆	
									Granular cell tumour	☆	
MISCELLANEOUS CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Benign breast calcifications	☆				Epidermal inclusion cyst	☆					
Lactational changes	☆				Sebaceous cyst	☆					
					Galactocoele	☆					
MALE BREAST CONDITIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Gynaecomastia	☆	☆			Pseudogynaecomastica	☆					
					Male breast cancer	☆					
POST - TREATMENT / PROCEDURE CHANGES											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Postoperative scar	☆				Lymphoedema	☆			Cosmetic injections (oil, gel, autologous fat)	☆	
Biopsy clip placement	☆				Seroma	☆			Gender affirmation post-surgical changes	☆	
					Breast reconstruction	☆					
					Breast reduction	☆					
					Haematoma	☆					
					Breast implant types and complications inluding rupture, silicon granuloma and Breast Implant Associated Anaplastic Large Cell Lymphoma (BIA ALCL)	☆					
I. OBSTETRIC AND GYNAECOLOGY CONDITIONS											
VULVA, VAGINA AND URETHRA											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Bartholin cyst and bartholinitis	☆	☆			Gartner duct cyst	☆	☆		Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome	☆	☆
					Urethral diverticulum	☆			Vaginal atresia and septa	☆	☆
					Urethral prolapse	☆			Leiomyoma/Leiomyosarcoma	☆	☆
					Vaginal fistula	☆			Yolk sac tumour	☆	☆
									Carcinoma	☆	
									Extramammary Paget disease	☆	
									Embryonal rhabdomyosarcoma	☆	
									Gender affirmation postoperative changes	☆	

UTERINE CERVIX											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Nabothian cysts	☆				Cervical stenosis	☆			Adenoma malignum	☆	
Endocervical polyp	☆	☆			Lobular Endocervical Glandular Hyperplasia (LEGH)	☆	☆		Sarcoma	☆	
Squamous cell carcinoma	☆	☆			Adenocarcinoma	☆	☆		Melanoma	☆	

UTERINE CORPUS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Congenital uterine anomalies including hypoplasia/agenesis, unicornate and bicornuate uterus, uterus didelphys, septate uterus, arcuate uterus, congenital cysts, hydrocolpos	☆		☆/F		Endometrial hyperplasia including atypical	☆	☆		Pyomyoma	☆	
Haematometrocolpos	☆	☆		☆	Endometrial adenocarcinoma including endometrioid, mucinous and villoglandular (Type I) and serous and clear cell (Type II)	☆	☆		Malignant mixed mesodermal tumour	☆	
Endometritis	☆	☆			Leiomyosarcoma	☆	☆		Endometrial stromal sarcoma	☆	
Endometrial synechiae including Asherman syndrome	☆	☆									
Endometrial polyp	☆	☆									
Adenomyosis including adenomyoma and cystic adenomyosis	☆	☆									
Leiomyoma (fibroid) including knowing of parasitic, benign metastasizing, diffuse, intravenous, disseminated, lipomatous variants	☆	☆									

FALLOPIAN TUBE (AND BROAD LIGAMENT)											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Pelvic inflammatory disease	☆	☆			Paratubal cyst (congenital)	☆					
Tubo-ovarian abscess	☆	☆		☆	Actinomycosis	☆					
Hydrosalpinx	☆	☆			Broad ligament leiomyoma (fibroid)	☆	☆				
Pyosalpinx	☆	☆			Adenocarcinoma	☆	☆				
Haematosalpinx	☆	☆			Salpingitis including tuberculous and salpingitis isthmica nodosa	☆	☆				

OVARY											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Ovarian / acute adnexal torsion	☆	☆	☆	☆	Transitional cell (Brenner) tumours	☆	☆		Gonadal dysgenesis		☆
Follicular, corpus luteal, theca lutein, inclusion and haemorrhagic cysts	☆	☆	☆/F		Fibroma	☆	☆		Endometrioid tumours including benign, borderline and malignant	☆	
Polycystic Ovarian Morphology (PCOM)	☆	☆			Fibrothecoma	☆	☆		Clear cell tumours including benign, borderline and malignant	☆	
Ovarian cyst rupture	☆	☆		☆	Dysgerminoma	☆	☆	☆	Carcinoid	☆	
Mature cystic teratoma (dermoid cyst)	☆	☆			Yolk sac tumour	☆	☆	☆			
Endometriosis including endometrioma as well as abdomino-pelvic and remote disease	☆	☆			Serous and mucinous tumours (benign, borderline, malignant) including cyst adenoma/ adenocarcinoma/adenofibroma	☆	☆				
					Immature teratoma	☆	☆	☆			
					Struma ovarii	☆	☆				
					Ovarian vein thrombosis	☆					
					Pelvic congestion syndrome	☆					
					Ovarian hyperstimulation syndrome	☆	☆				

PREGNANCY - FIRST TRIMESTER CONDITONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Anembryonic pregnancy (miscarriage)	☆	☆		☆	Chorio-amniotic separation	☆					
Ectopic pregnancy (tubal, interstitial, cervical, caesarean section scar, abdominal, heterotopic pregnancy)	☆	☆		☆	Cystic hygroma	☆	☆				
Pregnancy of unknown location	☆	☆			Hydrops	☆	☆				
Perigestational haematoma	☆										
Cervical incompetence/shortened cervix	☆										
Physiological gut herniation	☆										
Thickened nuchal translucency	☆										

PLACENTA AND UMBILICAL CORD											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Placenta praevia	☆	☆			Placentomegaly	☆			Placental infection	☆	
Placental haemorrhage and abruption	☆	☆			Placenta accreta spectrum disorder (PAS) (morbidly adherent placenta) including accreta, increta, and percreta	☆	☆		Placental mesenchymal dysplasia	☆	
Placental variations including succenturiate lobe, circumvallate placenta and placenta membranacea	☆	☆			Gestational Trophoblastic Disease (GTD) including hydatidiform mole and Gestational Trophoblastic Neoplasia (GTN) (invasive moles, choriocarcinomas, placental-site trophoblastic tumours, epithelioid trophoblastic tumours)	☆	☆		Placental site trophoblastic tumour	☆	
Abnormal cord insertion including velamentous and marginal	☆	☆			Single umbilical artery	☆			Epithelioid trophoblastic tumor	☆	
Vasa praevia	☆	☆			Persistent right umbilical vein	☆			Cord haemangioma	☆	
Synechiae	☆	☆			Umbilical cord cysts	☆			Teratoma - cord, placenta	☆	
Placental lake including intervillous thrombus	☆				Umbilical vein varix	☆					
Retained Products of Conception (RPOC) and Enhanced Myometrial Vascularity (EMV)	☆	☆			Amniotic band syndrome	☆					
Hydatidiform mole	☆	☆			Chorioangioma	☆	☆				

MULTIFETUS GESTATIONS											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Dichorionic - diamniotic twins	☆	☆			Triplets and higher-order multiples	☆	☆		Conjoined twins	☆	
Monochorionic - diamniotic twins	☆	☆			Twin Anaemia-Polycythaemia Syndrome (TAPS)	☆	☆		Fetus-in-fetu	☆	
Monochorionic - monoamniotic twins	☆	☆			Twin Reverse Arterial Perfusion Syndrome (TRAPS)	☆					
Twin-twin transfusion syndrome	☆	☆									
Discordant twin growth	☆										

MATERNAL CONDITIONS IN PREGNANCY											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Pre-eclampsia and eclampsia	☆	☆			Uterine rupture	☆					
Ureterectasis of pregnancy	☆										

FETAL WELL BEING ASSESSMENT											
Category 1	GEN	PATH	PAED	KC	Category 2	GEN	PATH	PAED	Category 3	GEN	PAED
Intrauterine Growth Restriction (IUGR) including placental insufficiency	☆		☆								
Small for Gestational Age (SGA)	☆		☆								
Large for Gestational Age (LGA) and macrosomia	☆		☆								
Fetal anaemia	☆										
Liquor volume abnormalities - oligo/ polyhydramnios	☆										

J. STAGING SYSTEM AND CLASSIFICATION GUIDE		
Category 1	ESSENTIAL	DESIRABLE
HEAD AND NECK		
Nasopharyngeal carcinoma	☆	
Thyroid Cancer		☆
SKIN		
Squamous cell carcinoma (head & neck)		☆
Melanoma	☆	
CHEST		
Carcinoma of the lung	☆	
Mesothelioma		☆
ABDOMEN AND PELVIS		
Oesophageal and gastro-oesophageal junction carcinoma		☆
Stomach cancer		☆
Gastrointestinal euroendocrine tumour		☆
Colon and rectal carcinoma	☆	
Hepatocellular carcinoma		☆
Gall bladder cancer		☆
Pancreatic carcinoma	☆	

Prostatic cancer		☆
Renal cell carcinoma		☆
Bladder carcinoma		☆
Testicular cancer		☆
O&G		
Carcinoma of the cervix		☆
Endometrial Cancer		☆
Carcinoma of the ovary		☆
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Carcinoma of the breast	☆	
MSK		
Bone malignancy		☆
Soft tissue sarcoma		☆
PAEDIATRIC		
Neuroblastoma	☆	
Wilms' tumour	☆	
Hepatoblastoma		☆
HAEMATOLOGICAL		
Lymphoma	☆	

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