National Community Referral Criteria for Imaging (Part I)

September 2025 *(Updated April 2026)*

Health New Zealand
Te Whatu Ora

Contents

Overview

The Community-referred radiology (CRR) Referral Criteria are national criteria. They replace the previous, non-mandatory, Ministry of Health "National Criteria for Access to Community Radiology[1]" (2015) and have been developed based on published evidence and recognised, evidence-based guidelines where these are available and relevant to the Health New Zealand context. However, for many clinical presentations to primary care, evidence-based care pathways are lacking, and published guidelines give varying advice. As such, where necessary, criteria are based on a compromise between specialist advice and Health New Zealand-funded resource availability. They have been broadly agreed through discussion between general practitioners, specialists, and radiologists and endorsed by the National Radiology Network (NRN) and the National Clinical Governance Group (NCGG).

These criteria set out a mandatory minimum level of radiology access to help primary care practitioners manage patients in the community and are part of the wider CRR programme. Imaging advice across the Community HealthPathways platform are being updated to align with these criteria and the criteria are published in the Radiology pages under HealthPathways Investigations. Nationally consistent access to imaging is a primary objective of the CRR programme. The local HealthPathways will reflect the national clinical criteria, whilst also expressing the local service model and resource variability. These local adaptations will express the "how" and "where" this imaging will be accessed locally.

Scope

The scope of community radiology is set out in the National Community Radiology Service Specification. For the purposes of these criteria and the CRR programme, however, the following applies:

1. X-ray, ultrasound and CT imaging referral criteria for both adults and children are specified here (part 1). Criteria for additional imaging modalities including MRI, breast imaging, nuclear medicine, fluoroscopy, and DEXA will be published in future phases (part 2).
2. Eligible referrers are limited at this stage of the CRR programme to general practitioners and urgent care doctors, and nurse practitioners for CT, ultrasound, and x-ray access. The scope of eligible referrers will be reviewed in subsequent criteria releases and updates.
3. Imaging covered by ACC or other funding streams, including under the Primary Maternity Services Notice (2021), is outside the scope of these criteria.
4. Imaging that is part of a screening or surveillance programme is outside the scope of these criteria.
5. The age band covered by the paediatric criteria has been specified as up to and including 15 years of age, however local paediatric service age group variation is acknowledged.

[1] Ministry of Health. 2015. National Criteria for Access to Community Radiology. Wellington: Ministry of Health.

Referrals that require specialist advice
The national criteria are not exhaustive and there are many patient presentations that may need imaging, but do not meet the listed CRR radiology criteria. A key role of the CRR Hub is to support and advise primary care regarding:

- whether radiology is required,
- the type and timing of radiology investigations,
- alternative clinical advice to support patient management.

Radiology advice may be provided by a Primary Care Radiology Liaison (PCRL) or Radiologist. This includes recommendations on a radiology report which align with established NZ guidance.

Telephone or written advice may also come from a relevant secondary care specialist. This would normally be from a Senior Medical Officer but at times this may be delegated to a senior Resident Medical Officer of the relevant speciality.

If the referral was discussed with and endorsed by any secondary care clinician, radiologist, or primary care radiology liaison, always include the name and role of that person in the referral.

Prioritisation and Wait Times
The criteria also include the agreed referral turnaround times and applicable wait list priority codes based on clinical acuity and the potential for the imaging findings to impact the patient's management outcome. The priority codes are selected from the National Radiology Network Radiology Service Level Guide (ref. Appendix 1), which includes expected reporting turnaround times and provision for identifying cases where the imaging may be more safely deferred in the event of prolonged radiology capacity restriction. Local HealthPathways set out the specific referral process for the different prioritisation or acuity groups.

The priority codes applied to these community-referred criteria are acute (within 24 – 48 hours), urgent P2 (within two weeks), non-urgent P3 (within six weeks), P4 Deferrable (within 6-12 weeks), or a "S" specified date code for follow up studies.

Referral Information:
Alongside sufficient clinical detail to enable accurate referral triage and image interpretation, it is critical for patient safety that referrals include **information for reporting findings which need to be urgently acted on**.

Adherence to national criteria

Requests will be reviewed by a Primary Care Radiology Liaison (PCRL) both for alignment with these published criteria and to allocate the appropriate wait-time priority. Requests not meeting the agreed criteria will be further considered on a case-by-case basis according to available clinical information. If a request is not accepted and returned to the referrer, the PCRL will indicate the reason for not accepting the referral.

However, indications for diagnostic imaging may not always be clear-cut and primary care health professionals are encouraged to make contact with Primary Care Radiology Liaisons or the district Radiology Service to discuss returned referrals further if they feel their concerns about a patient have been misinterpreted, or if a patient's presentation does not meet the published criteria, and the primary care health professional feels imaging investigation is warranted.

Updating the criteria

These national criteria will be updated from time to time, to reflect changing clinical practice, local policy changes, and user feedback. This change process will be managed collaboratively by regional CRR hubs to ensure national consistency is maintained.

Glossary of Abbreviations

ACR	American College of Radiology
ACR	Albumin: Creatinine Ratio
ADPKD	Autosomal Dominant Polycystic Kidney Disease
ALP	Alkaline Phosphatase
ALT	Alanine Transferase
ANH	Antenatal Hydronephrosis
AP	Antero-Posterior
ATD	Access to Diagnostics
AUB	Abnormal Uterine Bleeding
*B*hCG	*Beta*- Human Chorionic Gonadotrophin
BMI	Body Mass Index
BPAC	Best Practice Advisory Centre
BRCA	BReast CAncer gene
CAP	Community Acquired Pneumonia
CKD	Chronic Kidney Disease
COPD	Chronic Obstructive Pulmonary Disease
CRC	ColoRectal Cancer
CRR	Community Referred Radiology
CT	Computed Tomography
CTA	Computed Tomography Angiography
CTPA	Computed Tomography Pulmonary Angiography
CVA	Cerebro-Vascular Accident
DDH	Developmental Dysplasia of the Hip
DVT	Deep Vein Thrombosis
DXA	Dual Energy X-ray Absorptiometry (Bone density measurement)
EC	Endometrial Cancer
eGFR	(estimated) Glomerular Filtration Rate
EH	Endometrial Hyperplasia
EMA	Early Medical Abortion
ERMS	Electronic Referral Management Scheme
FDG	Fluoro-Deoxy-Glucose
FL	Fluoroscopy
FNA	Fine-Needle Aspiration
FSA	First Specialist Appointment
GGT	Gamma-Glutamyl Transferase
HCC	Hepatocellular Carcinoma
hCG	Human Chorionic Gonadotrophin
HPOA	Hypertrophic Pulmonary Osteo-Arthropathy
HRCT	High Resolution Computed Tomography
ILD	Interstitial Lung Disease
IMB	Inter-Menstrual Bleeding
INCS	Intra-Nasal CorticoSteroids
ITN	Incidental Thyroid Nodule
IUCD	Intrauterine Contraceptive Device
IVU	Intra-Venous Urogram
KUB	Kidneys Ureter Bladder
LMC	Lead Maternity Carer
MG	Mammography
MHT	Menopausal Hormone Therapy (previously known as HRT)
MRI	Magnetic Resonance Imaging

MSK	MusculoSKeletal
NM	Nuclear Medicine
NP	Nurse Practitioner
NRN	National Radiology Network
O-RADS	Ovarian-adnexal Reporting And Data System
PCOS	PolyCystic Ovary Syndrome
PCR	Protein Creatinine Ratio
PCRL	Primary Care Radiology Liaison
PET	Positron Emission Tomography
PID	Pelvic Inflammatory Disease
POAC	Primary Options for Acute Care
POADMS	Primary Options for Acute Demand Management
PSA	Prostate Specific Antigen
RPOC	Retained Products of Conception
SUFE	Slipped Upper Femoral Epiphysis
TIA	Transient Ischaemic Attack
TSH	Thyroid Stimulating Hormone
ULN	Upper Limit of Normal
US	Ultrasound
UT	Urinary Tract Infection

Adult CT

CT Chest, Abdomen and Pelvis - Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
	Guidance: *This Radiology pathway is intended to cover the scenario where patients present with nonspecific symptoms, and the primary care practitioner suspects underlying primary or secondary malignancy in the abdomen or pelvis, no cause or localising features (or mass for tissue sampling) are evident on examination or initial investigations including CXR and blood tests, and there is no clear referral pathway available.* *The use of CT Chest, Abdomen and Pelvis should be reserved for patients where after initial investigations and review, the primary care practitioner remains strongly suspicious of underlying malignancy. The presence of two or more persistently abnormal blood test results (Hb, CRP, Ca, ALP) significantly increases the probability of cancer being diagnosed.* *For clinical presentations with other non-specific symptoms and signs and abnormal lab results where the primary care practitioner is strongly suspicious of underlying malignancy but not meeting either of these criteria below; discussion with Primary Care Radiology Liaison or secondary care specialist or radiologist for consideration of CT imaging is recommended.*	NHS England » Faster diagnosis Prioritising primary care patients with unexpected weight loss for cancer investigation: diagnostic accuracy study (update) | The BMJ Routine blood tests and probability of cancer in patients referred with non-specific serious symptoms: a cohort study - PMC (nih.gov) A differentiated approach to referrals from general practice to support early cancer diagnosis – the Danish three-legged	GP & UC Doctors / NPs
P2 Urgent: non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral	Consider direct referral for CT chest, Abdomen and Pelvis if: • Following full clinical assessment and examination and initial investigations (bloods, urinalysis and CX-RAY), the primary care practitioner has a strong suspicion of underlying malignancy but no focal pathology or localising signs/symptoms or potential biopsy site has been identified **AND** ○ Male over **50** years of age or female over **60** years, and there is unintentional, unexplained, documented weight loss of more than 5 % of usual body weight over 3-6 months (+/- yellow flag symptoms of abdominal pain, fatigue, nausea) OR		

	○ Male over **40** years of age or female over **50** years of age, and there is unintentional, unexplained, documented weight loss of more than 5 % of usual body weight over 3-6 months (+/- yellow flag symptoms of abdominal pain, fatigue, nausea) **AND** two or more of following abnormal lab test results, which are unexplained, and persistent on repeat testing after three weeks: raised CRP, low haemoglobin raised calcium, high platelet count, high alkaline phosphatase, low albumin. OR ○ Secondary care clinician or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for urgent CT Chest, Abdomen and Pelvis.	strategy - PMC (nih.gov) Suspected Abdominal and Pelvic Cancer - Community HealthPathways Waitaha | Canterbury Vague Symptoms Suspected Cancer Assessment - Community HealthPathways Cwm Taf Morgannwg	
Alternative management or HealthPathway recommended.	• Patient has a current cancer diagnosis and under continued follow up. • Patient has been investigated by secondary care within the last 12 months for the same symptoms/ signs - request follow-up review. • Presentation requiring urgent admission or urgent secondary care assessment. • Localising clinical features or results from preliminary investigations which suggest cancer in a specific system. • Recent ultrasound of abdomen & pelvis within the last three months - Seek advice from a radiologist, or other appropriate secondary care specialist. • CT Chest, Abdomen & Pelvis within the last 12 months - seek advice from a radiologist, or other appropriate secondary care specialist.		
Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. **Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.**	• Patient is unfit for treatment or unwilling to have further investigations and / or treatment.		

CT Chest - Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Refer for acute assessment without initial imaging	• Life threatening, massive haemoptysis – patient is at high risk of asphyxiation or exsanguination • Stridor / suspected SVC obstruction	Superior vena cava syndrome - Symptoms, diagnosis and treatment | BMJ Best Practice	GP & UC Doctors / NPs

P2 Urgent: non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	*Guidance: Lung Cancer Imaging* *A diagnosis of lung cancer and initiating imaging investigations should be considered for all patients with concerning symptoms or signs[*1] which last more than 3 weeks or sooner if the patient has risk factors for lung cancer. [*2]* *In addition, in New Zealand, patients who identify as Māori have higher rates of lung cancer than non-Māori and a lower threshold for investigating concerning symptoms or signs[*1] should be considered especially if the patient has risk factors[*2]* *Urgent Chest x-ray (CXR) (preferably same or next day) remains the initial investigation of choice for symptomatic patients where lung cancer is suspected.* *However, studies suggest the sensitivity of a CXR is around 75-80% highlighting the importance of having "safety netting" [*3] in place for symptomatic patients with a normal CXR.* *The presence of multiple signs and symptoms, particularly in combination with haemoptysis, weight loss or persistent thrombocytosis has a significantly stronger positive predictive value for lung cancer.*	P79 Single Point of Access Clinic (SPOAC): a new regional lung cancer pathway in New Zealand | Thorax (bmj.com) Supporting the earlier diagnosis of lung cancer | Cancer Research UK Assessment of haemoptysis - Diagnosis Approach | BMJ Best Practice Hemoptysis (acr.org) Incidence of lung cancer amongst primary care chest radiograph referrals—an evaluation of national and local datasets within the United Kingdom | British	

	• Unexplained haemoptysis (occurred in absence of chest infection and upper respiratory tract causes including bleeding from the nasopharynx, sinuses, or oral cavity have been excluded),
	And initial investigations including chest x-ray fail to identify a cause - refer for urgent CT chest and for respiratory assessment.
	
	• Aged over 55 years' old, current smoker; AND
	  ○ One or more concerning, new onset, **symptoms /signs for lung cancer** [*1]
	  ○ Persistent for **six weeks** despite appropriate treatment.
	  ○ AND **unexplained** despite initial investigations including **chest x-ray and blood tests.**
	
	• Indeterminate abnormality on chest x-ray which raises the possibility of a lung cancer (e.g. bulky hilum), AND CT chest is recommended in the Radiology report.
	
	• Persistent consolidation on chest x-ray done as a 6-week follow-up study AND CT chest is recommended in the Radiology report.
	
	• Secondary care clinician or Radiologist advises referral for urgent staging CT chest/liver for work up of a suspicious lesion on chest x-ray, AND CT is the advised next step on local HealthPathway as opposed to referral to secondary care or PET-CT [*4]
	
	• Secondary care clinician or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for urgent CT chest
		Journal of Radiology | Oxford Academic (oup.com)
		
		Investigation report: Missed detection of lung cancer on chest X-rays of patients being seen in primary care (hssib.org.uk)
		
		Guideline concordance for timely chest imaging after new presentations of dyspnoea or haemoptysis in primary care: a retrospective cohort study | Thorax (bmj.com)
		
		Cancer Research UK-Risk Assessment Tools
		
		Recognising Lung Cancer in Primary Care - PubMed	

P3: non-deferrable, imaging or intervention that must be completed within 6 weeks of receiving referral	• Isolated, pulmonary nodule identified on a chest x-ray and cannot be confirmed as benign from x-ray appearances alone AND referral for CT chest is recommended in the Radiology report • Secondary care clinician or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for non-urgent CT chest	Canterbury Community HealthPathways CT chest HealthPathway i-refer (RCR) UK, "Lung nodules"	

Alternative management or HealthPathway recommended	• Patient re-presents with concerning symptoms or signs and chest x-ray is normal, but doesn't meet the above criteria for CT chest referral – seek advice from secondary care respiratory team, regarding appropriate management and whether CT chest is warranted. • Persistent, non-specific, non-localising symptoms and signs which are concerning for underlying cancer (e.g. weight loss, fatigue) and initial investigations including chest x-ray and bloods fail to identify a cause. See CT Chest/Abdomen/Pelvis HealthPathway. • Initial presentation with respiratory symptoms or signs concerning for lung cancer - refer for urgent chest x-ray as the initial investigation. • Follow-up of nodule discovered incidentally on CT chest scan - refer to secondary care for management advice unless radiology report confirms benign based on CT appearance and no follow-up is required (e.g. intrapulmonary lymph node, benign pattern of calcification).	3D HealthPathways Canterbury HealthPathways MoH Comm Rad Criteria 2015 Mid-Central Advisory Oncology Pathway	

Notes:

[*1] Concerning symptoms and signs for lung cancer

- Unexplained, new, or worsening dyspnoea.
- Unexplained cough, persisting and worsening for more than 3 weeks.
- Unexplained chest and/or shoulder pain persisting for more than 3 weeks.
- Unexplained changes in existing symptoms in patients with underlying chronic respiratory problems persisting for more than 3 weeks.
- Unexplained hoarseness persisting for more than 3 weeks.
- Repeated / or unresolved chest infections.
- Persistent, unexplained haemoptysis
- Unexplained weight loss and loss of appetite persisting for more than 3 weeks.
- Un-investigated/unexplained abnormal chest signs persisting for more than 3 weeks. (e.g. suspected pleural effusion)
- New, supraclavicular lymphadenopathy
- Features suggestive of paraneoplastic syndromes. e.g. hypercalcaemia, hypertrophic osteoarthropathy with finger (and toe) clubbing and painful swollen joints
- New cervical lymphadenopathy persisting for more than 3 weeks and nodes are more than 1 cm in diameter in a patient with other lung cancer symptoms or signs or risk factors.

[*2] Risk factors for lung cancer

- Current or past smoker – increased risk with duration and to lesser extent quantity. Reduced risk with duration since quitting especially more than 15 years. A total of less than 100 cigarettes smoked in lifetime can be considered risk-equivalent to having never smoked.
- Family history – lung cancer diagnosed in sibling and to lesser extent in parent.
- Personal history of cancer especially head and neck cancer
- History of lung disease including chronic obstructive pulmonary disease (COPD), cystic fibrosis
- Exposure to cancer causing agents including asbestos, radon, air pollutants.

[*3] Safety netting after normal chest x-ray – With the sensitivity of chest x-ray for lung cancer reported as 75-80%, a normal chest x-ray may provide false reassurance. Safety netting is a diagnostic management strategy that aims to ensure patients are monitored throughout the diagnostic process until their symptoms or signs are explained or have resolved. Persistent, or

worsening, unexplained respiratory symptoms and especially clusters of symptoms and especially in patients at increased risk of lung cancer warrant further investigation despite a normal chest x-ray, by way of referral for chest CT or discussion with a secondary care clinician or Primary Care Radiology Liaison.

*4 Local pathways–direct to PET CT: Where chest x-ray findings are suspicious for a lung cancer but there are no features on the chest x-ray to suggest it is not curable, the preferred next step in some districts where there is available resource, is to proceed directly with whole body PET-CT rather than CT chest.

CT Colonography (or Colonoscopy) - Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
	Guidance: *The Ministry of Health and Bowel Cancer Working Group recommendation is for all referrals for investigation of Bowel Symptoms meeting the direct access referral criteria to be referred to secondary care via a single point of entry and triage to either Colonoscopy or CT Colonography (CTC) (2019)* *CT Colonography (vs. Colonoscopy) may be an appropriate investigation where the patient being referred is:* ○ *over 80 years* ○ *and/or has significant co-morbidities. (e.g. COPD) where colonoscopy presents a higher risk (e.g. respiratory risk from sedation)* ○ *or following failed or incomplete colonoscopy.* *CTC is of comparable sensitivity to colonoscopy for the detection of clinically significant polyps and tumours.*	Referral Criteria for Direct Access Colonoscopy of CT Colonography 2019 Ministry of Health i-refer (RCR UK)	GP & UC Doctors / NPs
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Refer for consideration of P2 colonoscopy vs. CTC for all patients presenting with any of: ○ Altered bowel habit (looser and/or more frequent) > six weeks duration plus unexplained rectal bleeding (benign anal causes treated or excluded**), aged >50 years. ○ Unexplained rectal bleeding (benign anal causes treated or excluded**) with iron deficiency anaemia (haemoglobin below the reference range in conjunction with low ferritin) ○ Known or suspected CRC (on imaging, or palpable, or visible on rectal examination), for pre-operative procedure to rule out synchronous pathology. ○ Secondary care clinician or radiologist advises referral for urgent CTC. AND	Referral Criteria for Direct Access Colonoscopy of CT Colonography 2019 Ministry of Health	

	○ are able to tolerate bowel prep and the procedure and possible further treatment and ○ have not had a previous colonoscopy or CTC within the last 5 years unless there is a clear indication to repeat the procedure.		
P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Refer for consideration of P3 colonoscopy vs. CTC all patients presenting with one of: ○ Altered bowel habit (looser and/or more frequent) for more than six weeks' duration, aged 50 years or older. ○ Altered bowel habit (looser and/or more frequent) for more than six weeks' duration plus unexplained rectal bleeding (benign anal causes treated or excluded), aged 40 to 50 years. ○ Unexplained rectal bleeding (benign anal causes treated or excluded) aged 50 years or older. ○ Unexplained iron deficiency anaemia (i.e. Haemoglobin below local reference range in conjunction with low ferritin) ○ New Zealand Guidelines Group (NZGG) Category 2 family history plus one or more of altered bowel habit (looser and/or more frequent) for more than six weeks' duration plus unexplained rectal bleeding (benign and anal causes treated or excluded), aged 40 years or older *1. ○ NZGG Category 3 family history plus one or more of altered bowel habit (looser and/or more frequent) for more than six weeks' duration plus unexplained rectal bleeding (benign and anal causes treated or excluded), aged 25 years or older*1. ○ Secondary care clinician or Radiologist advises referral for non-urgent CTC. <u>AND</u> ○ can tolerate bowel prep and the procedure and possible further treatment and ○ have not had a previous colonoscopy or CTC within the last 5 years unless there is a clear indication to repeat the procedure	Referral Criteria for Direct Access Colonoscopy or CT Colonography 2019 Ministry of Health	
Alternative management or HealthPathway recommended.	• Rectal bleeding aged less than 50 years (normal haemoglobin) – consider secondary care referral for assessment and possible flexible sigmoidoscopy if no anal cause		
Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. **Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.**	• Acute diarrhoea for less than six weeks duration where it most likely has an infectious aetiology. • Irritable bowel syndrome • Constipation as a single symptom • Uncomplicated CT-proven diverticulitis without suspicious radiological features • Abdominal pain alone without any of the P3, six-week category features listed above. • Low ferritin with normal haemoglobin in a patient aged younger than 50 years		

	• Abdominal mass – Manage as per the local Colorectal Symptoms pathway as an FSA, CT scan or other investigations may be more appropriate		

*1 Update-on-Surveillance-Recommendations-for-Individuals-with-a-Family-History-of-Colorectal-Cancer.pdf (tewhatuora.govt.nz)

Category 2 moderately increased familial risk of colorectal cancer

- one first-degree relative diagnosed with CRC under the age of 55 years,

or

- two first-degree relatives on the same side of the family/whānau diagnosed with CRC at any age (without any of the potential high-risk features in Category 3).

Category 3 potentially high risk of colorectal cancer

- a family/whānau history of familial adenomatous polyposis (FAP), Lynch syndrome or other familial CRC syndromes
  - one first-degree relative plus two or more first- or second-degree relatives all on the same side of the family/whānau with a diagnosis of CRC at any age
  - two first-degree relatives, or one first-degree relative plus one or more second-degree relatives, all on the same side of the family/whānau with a diagnosis of CRC, and one such relative:
    - was diagnosed with CRC when aged 54 years or under,
    - or developed two or more bowel cancers,
    - or developed an extracolonic tumour suggestive of Lynch syndrome (i.e., endometrial, ovarian, stomach, small bowel, renal pelvis, pancreas or brain)
  - a first-degree relative with CRC diagnosed under the age of 50, where colorectal tumour immunohistochemistry has revealed loss of protein expression for one of the mismatch repair genes (i.e., MLH1, MSH2, MSH6 or PMS2) and further testing (BRAF or methylation) raises the possibility of Lynch syndrome
  - at least one first- or second-degree family/whānau member diagnosed with CRC in association with multiple bowel polyps (10 or more adenomas at one time or 5 or more advanced adenomas at one time, or 20 cumulative adenomas, 10 cumulative adenomas if the patient is aged 30 years or younger) or a polyposis syndrome
  - a first-degree relative with multiple colonic polyps (10 or more adenomas at one time or 5 or more advanced adenomas at one time, or 20 cumulative adenomas, or 10 cumulative adenomas if the relative is aged 30 years or younger).

CT Head - Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**

Acute: Within 48 hours	*Guidance: Transient Ischaemic Attack (TIA)*
	
	For clinically suspected anterior circulation events, and if the patient is a potential candidate for carotid endarterectomy, carotid angiography (CTA)or if unavailable, carotid ultrasound, should be added to the CT head exam.
	
	• TIA, where it is within 7 days of the TIA episode and
	  ○ CT +/-CTA recommended by HNZ neurologist / stroke specialist or physician.
	  OR
	  ○ Patient has no high-risk features [*1] and assessed as suitable for being managed in the community AND completion of the BPAC TIA decision support tool indicates CT head +/- carotid imaging is appropriate.
	  OR
	  ○ Patient is unable to access rapid specialist care.
	
	• Focal neurologic signs - consider seeking neurologist advice first
	• Seizure in palliative care setting and result may change management.
	• Secondary care clinician or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for same or next day CT scan.
		Appropriateness of general practitioner imaging requests for transient ischaemic attack patients: secondary analysis of a cluster randomised controlled trial (csiro.au)
		
		Verbal advice Professor. Anna Ranta as SME
		
		ANZ Living Clinical Guidelines for Stroke Management - Early assessment and diagnosis v6.8
		
		Right Decision Services HCI NHS Scotland *1
			GP & UC Doctors / NPs

P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Headaches**:** A change in the pattern of headaches, with a progressive increase in frequency or severity, especially in patients aged 50 years and older
	AND any of:
	
	  ○ chronic illness associated with potential cerebral complications or involvement, especially malignancy. The most likely cancers to metastasise to the brain are lung, breast, and melanoma.
	  ○ exacerbated by coughing, sneezing, or Valsalva manoeuvre in a pattern not typical of a migraine.
	  ○ associated with persistent nausea and vomiting (i.e. not typical of a migraine or other primary headache)
	  ○ objective neurological deficit causing disturbances of speech, or limb or facial weakness.
	• Cognitive impairment with 1 or more features to suggest symptoms are secondary to a space-occupying lesion (SOL), bleed, or hydrocephalus [*2:]
	
	  ○ Rapid cognitive decline over weeks
		i-Refer OCCP Glioma (AU) NICE 2019
		
		i-Refer ACR Appropriateness criteria
		
		OCCP Glioma (AU, HealthPathway Canterbury	

	○ Presence of focal neurological signs ○ History of falls ○ Anticoagulant therapy ○ Gait ataxia or incontinence. ○ History of cancers with propensity to brain metastases – lung, melanoma, breast • First seizure in patient aged 21 years or older, where there is a clear history and the patient is low risk[3], or where MRI (preferred first-line investigation) is not available, clear history, and low risk[*] or MRI not available • Secondary care clinician or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for urgent CT scan.		
P4 Deferrable. If capacity is constrained could wait up to 6-12 weeks from receiving referral.	• Cognitive impairment without any features suggestive of SOL, bleed, or hydrocephalus[*2]: and establishing the subtype diagnosis will alter management. • Secondary care clinician or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for non-urgent, CT scan.	HP i-Refer	
Alternative management or HealthPathway recommended.	• Suspected Prolactinoma – request non-acute assessment by the appropriate secondary care specialist. • Seizures with risk factors for intracranial pathology[4] – seek Neurology phone advice • Poorly controlled or recurrent seizures – follow the appropriate pathway: ○ Epilepsy in Adults ○ Epilepsy in Women ○ First Seizure in Adults ○ Seizure in Palliative Care	3D HealthPathways Canterbury HealthPathways MoH Comm Rad Criteria 2015	
Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.	• Established, advanced dementia of more than 2 years duration, no unexpected change in disease progression and establishing the subtype will not alter management.	MoH Comm Rad criteria 2015	

*1 High risk features for TIA
- Less than 59 years old
- ABCD[2] greater than 4

- Crescendo TIAs
- Atrial fibrillation
- On anticoagulants
- Severe or prolonged deficit (hemiparesis longer than 60 minutes)
- Known carotid artery stenosis.

*2 Features suggestive of underlying SOL, bleed, or hydrocephalus

- Rapid cognitive decline over weeks
- Presence of focal neurological signs
- History of falls
- Anticoagulant therapy
- Gait ataxia or incontinence.
- History of cancers with propensity to brain metastases (e.g. lung, melanoma, breast)

*3 Criteria for low-risk first seizure – all of the following must apply:

- Single seizure which is unprovoked, or provoked by a known substance (e.g. drug or alcohol use)
- Patient has since returned to normal health
- There are none of the following risk factors for intracranial pathology:
  - Head injury
  - Aged older than 40
  - Fever, systemic symptoms
  - History of anticoagulation, malignancy
  - New focal neurologic deficit
  - Focal seizure
  - Persistent altered mental state
  - Persistent headache

*4 Risk factors for intracranial pathology

- Head injury
- Aged older than 40
- Fever, systemic symptoms
- History of anticoagulation, malignancy
- New focal neurologic deficit
- Focal seizure
- Persistent altered mental state
- Persistent headache

CT Intravenous Urogram (IVU), CT Renal – Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
	Guidance: *CT IVU (also known as CT Urogram) is the best imaging investigation for renal masses and investigating painless haematuria and causes of obstruction, but this is at the expense of an increased radiation dose and the need for intravenous contrast. Images are obtained in 2 or 3 phases related to the contrast injection to image the kidneys in the nephrogenic phase and ureters and bladder in excretory phases.* *CT IVU, together with cystoscopy, should be used for older patients (40 years or older) with painless haematuria and in younger patients (less than 40 years.) when initial investigations (including ultrasound and cystoscopy) are abnormal or if haematuria persists.* *CT IVU uses a high dose of iodine contrast media which can be nephrotoxic. CT IVU is not recommended for patients with reduced renal function (eGFR lower than 30) or with known allergy to iodinated contrast. Renal ultrasound is the recommended investigation in these patient groups.*	Community HealthPathways i-refer (RCR UK) see below	GP & UC Doctors / NPs

P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Macroscopic haematuria, if:
	  ○ UTI excluded or haematuria persists after treating the UTI
	  ○ AND
	  ○ patient is aged between 40 and 85 years
	  ○ OR
	  ○ patient is younger than 40 years, and initial investigations, including renal ultrasound, are normal and haematuria persists.
	• Secondary care clinician or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for an urgent CT IVU or CT Renal scan		

P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• CT IVU recommended by secondary care specialist for unexplained asymptomatic microscopic haematuria after initial investigations including renal tract ultrasound fail to identify a cause • Multiphase renal CT recommended by secondary care specialist or Radiology report for further investigation of incidental finding on ultrasound including a solid lesion more than1cm in diameter, or complex cyst (Type Bosniak IIF, III, or IV)	Bosniak Classification of Cystic Renal Masses, Version 2019: An Update Proposal and Needs Assessment |	

	• Secondary care clinician or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for non-urgent CT IVU or CT renal scan	Radiology (rsna.org)	

CT KUB - Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
	Guidance: *For pregnant patients or females younger than 35 without haematuria, fever, history of stones, or solitary kidney, request renal tract ultrasound instead of CT KUB* *Consider arranging additional plain X-ray KUB at the same time. Confirming the stone is visible on x-ray at presentation enables 4-week follow-up, if required, with plain x-ray.* *Avoid requesting repeated CT KUB imaging in otherwise healthy patients aged younger than 50 years with a known history of kidney stones. If typical presentation without red flags, repeat imaging is not usually required.* [1]	Community HealthPathways i-refer (RCR UK)	GP & UC Doctors / NPs

Refer for acute assessment without initial imaging:	• Acute episode of suspected renal colic and the patient has any of the following:
	  ○ Creatinine greater than 160 mmol/L or eGFR less than 45 ml/min
	  ○ Solitary kidney
	  ○ Temperature above 38 degrees
	  ○ Peritonitis / signs of sepsis
	  ○ Known bilateral ureteric stones		

Acute: Within 24 hours	• Pyelonephritis where the patient has flank pain that does not improve despite 24 hours of intravenous or 48 hours of oral antibiotics – consider requesting CT KUB instead of renal ultrasound if considering renal colic as a differential diagnosis		
Acute: Within 48 hours	• First presentation of suspected renal colic with no red flags[1]. • Secondary care clinician or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for same or next day CT scan.		
S2 non-deferrable time-sensitive imaging that must be completed within 2 weeks of a specified target date	• Follow up, as recommended by the local Renal Colic and Urinary Tract Stones HealthPathway, if a calculus is not visible on KUB X-ray • Secondary care clinician or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for specified-date CT scan.		

Alternative management or HealthPathway recommended.	• Females aged younger than 35 years with renal colic – arrange acute renal ultrasound (within 48h) rather than CT KUB, unless the patient has red flags*1 requiring admission. • Pregnant women with renal colic – arrange acute renal ultrasound (within 48hr), unless the patient has red flags*1 requiring admission. Consider discussing with Obstetrics.	Community HealthPathways x10 i-refer	
Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. **Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.**	• Recurrent renal colic - imaging is not required if the pain is well controlled and the patient: ○ is aged younger than 50 years ○ is presenting with typical renal colic ○ has no red flags*1 ○ has had a confirmed stone on CT KUB during the last 5 years • Surveillance of asymptomatic patients with previous nephrolithiasis • Children younger than 16 years, consider requesting paediatric assessment		

*1 Renal colic “Red flags”

- Creatinine greater than 160 mmol/L or eGFR less than 45 ml/min
- Solitary kidney
- Temperature above 38 degrees
- Peritonitis / signs of sepsis
- Known bilateral ureteric stones

CT Other – Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Acute: Within 24-48 hours	• Secondary care clinician or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for same or next day CT scan not otherwise specified in these criteria		GP & UC Doctors / NPs
P2 Urgent: non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral	• Secondary care clinician or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for urgent CT scan not otherwise specified in these criteria • CT Abdomen and Pelvis recommended by a secondary care specialist, Primary Care Radiology Liaison, or Radiologist for suspicion of underlying malignancy*		
P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Secondary care clinician or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for non-urgent P3 CT scan not otherwise specified in these criteria • CT Abdomen and Pelvis recommended by a secondary care specialist, Primary Care Radiology Liaison, or Radiologist for suspicion of underlying malignancy*		
Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.	These criteria have increased the range of CT examinations for community referrers but there are still a number of examinations that at present are not included and will require referral to HSS Specialists. The list is not exhaustive but includes: • CT Cardiac • CT Spine • CT Biopsy • CT Lower Limb angiography. • CT Joints		

* This scan type can overlap with the indications for CT Chest, Abdomen and Pelvis but there may be times where only a dedicated CT of the abdomen and / or pelvis is required.

CT Sinus - Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
	Guidance: *Chronic Rhinosinusitis (CRS) symptoms and its clinical presentation to primary care have been shown to be poor predictors of sinus disease on imaging with a low specificity of approximately 30%.* *Early CT sinus to confirm the diagnosis has been shown to be both beneficial to the patient and more cost-efficient than presuming a diagnosis of CRS based on symptoms alone.* *Rhinosinusitis is one of the most common reasons for adult outpatient antibiotic prescriptions, though there is little clinical evidence to support this practice, especially for chronic rhinosinusitis. The aetiology of chronic rhinosinusitis is largely unknown but is likely to be multifactorial, with inflammation, infection and obstruction of sinus ventilation playing a part.* *As a result, evidence–based care pathways are lacking, and published guidelines give varying advice.* *These national CT sinus referral pre-requisites are necessarily based on a compromise between specialist advice and Health New Zealand funded resource availability.*	Primary care and upfront computed tomography scanning in the diagnosis of chronic rhinosinusitis: A cost-based decision analysis - Leung - 2014 - The Laryngoscope - Wiley Online Library	GP & UC Doctors / NPs

Refer for acute assessment without imaging	• Rhinosinusitis symptoms associated with any red flags for intracranial or orbital pathology including:
	  ○ Severe frontal headache
	  ○ Severe systemic symptoms
	  ○ Altered visual acuity or diplopia		

P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Suspected chronic rhinosinusitis
	  AND
	  ○ moderate to severe symptoms persist despite daily nasal saline irrigation and intranasal corticosteroids (INCS) trialled **for at least 12 weeks** with satisfactory patient technique and compliance
	  AND
	  ○ the patient has not previously had a CT sinus scan.
		Rhinosinusitis-commissioning-guide
		
		Is there a role for antibiotics in the treatment of chronic rhinosinusitis? (jacionline.org)	

	• ORL specialist or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for non-urgent CT sinus		

Alternative management or HealthPathway recommended.	• Rhinosinusitis symptoms associated with any of the following red flags for sino-nasal malignancy - refer for urgent ORL assessment
	  ○ Unilateral nasal obstruction with haemo-serous discharge
	  ○ Recent onset of Horner syndrome, diplopia, or cranial neuropathies, particularly sensory change
	  ○ Paraesthesia in the skin of cheek, maxillary gingiva, or hard palate
	• Seek ORL advice if severe sinusitis in an immunocompromised patient (e.g., suspected invasive fungal sinusitis in a patient on chemotherapy)
	• Request non-acute ORL assessment and mark the referral as urgent if the patient has either of the following:
	  ○ Suspected sinonasal malignancy
	  ○ Unilateral polyp reported on CT Sinus
	• Allergic rhinitis causing nasal obstruction, or discharge – See local Rhino-Sinusitis HealthPathway		

Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.	• Follow up scans to assess treatment response		

Adult Ultrasound

US Abdomen - Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Refer for acute assessment without imaging	• Suspected acute cholecystitis or cholangitis (i.e. intractable biliary colic not relieved by simple analgesia and especially if accompanied by fever, persistent vomiting) • Acute abdomen, including possible appendicitis • Suspicion of ruptured abdominal aortic aneurysm • Suspected testicular torsion • Painful jaundice	Local HealthPathways Suites National Referral Criteria 2013	GP & UC Doctors / NPs
Acute: Within 48 hours	• Painless jaundice without obvious cause - consider discussing with secondary care specialist or Primary Care Radiology Liaison as a CT scan may be more appropriate. • Secondary care clinician or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for same or next day ultrasound scan.		
P2 Urgent: non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral	• Initial presentation with ALP more than 2 times the upper limit of normal (ULN) and GGT higher than the ULN • Suspected acute cholecystitis / biliary colic with raised ALP and GGT +/- bilirubin and where symptoms settle with analgesia and biliary tree has not previously been imaged. • Secondary care clinician or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for urgent ultrasound scan.		

P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	*Guidance: Liver Function Tests and US investigation* *Opportunistic liver function testing is not indicated for asymptomatic people without risk factors.* *2.5% of the normal population will fall outside the upper limit of the reference range as part of the normal statistical distribution of results and test results may fluctuate as a physiological response.* *Elevated liver enzyme levels are estimated to occur in up to 9% of asymptomatic people.* *Abnormal liver blood test results should only be interpreted after review of the previous results, past medical history and current medical condition.* *Liver disease is rare among people with abnormal LFT results in primary care.* *On the other hand, severe liver disease may be present with little or no liver function abnormality so the level or duration of elevation should not determine the significance, but the result should be viewed within the context of trend, past medical and drug history and current symptoms.* *For practical purposes, as advised by BPAC[*1] marker abnormalities are usually considered "borderline" if they are less than 2 times the upper limit of normal (ULN) and "Mild" if they are 2 – 5 times the ULN.* *If hepatocellular injury is suspected and the patient does not have concerning symptoms/features, ultrasound is a second-tier investigation after investigating the most likely causes. Obesity and raised ALT provide strong evidence for a presumptive diagnosis of 'fatty' liver. Ultrasound is not always necessary.* *Ultrasound imaging is a first-line investigation if cholestasis is suspected based on LFT results.*	Guidelines on the management of abnormal liver blood tests - PMC . [*1] lfts.pdf (bpac.org.nz)	

	• Recurrent right upper quadrant / epigastric, non-dyspepsia pain without previous imaging
	
	• Suspected resolved acute biliary colic or cholecystitis, without previous imaging which showed gallstones and the patient is a potential candidate for and would accept a cholecystectomy
	
	• Follow up imaging on repeat testing 3 months or more after the initial presentation and:
	  ○ ALP was more than 2 times the ULN at the initial presentation AND on repeat testing 3 months later the :
	  ▪ Repeat ALP remains higher than the ULN
	  ▪ Repeat GGT remains higher than the ULN
	
	• ALT greater than 120 IU/L **AND**		

	○ Conservative methods (e.g. weight loss and lifestyle alterations or medication change) unsuccessful in patients with high risk factors (diabetes, obesity, medications that affect the liver, e.g. statins) ○ No clinical features of concern • Isolated raised GGT more than 5 times the ULN and persists on re-testing after 3 months. • Asymptomatic, newly suspected abdominal aortic aneurysm e.g. on clinical examination or other imaging. • Non-pulsatile abdominal mass and suspected enlarged liver on examination. • Secondary care clinician or Primary Care Radiology Liaison (PCRL) or radiologist advises referral for non-urgent ultrasound scan.		
S3 non-deferrable time sensitive imaging or intervention that must be completed within 6 weeks of a specified target date.	• HCC surveillance using liver ultrasound as initially recommended by a gastroenterologist or other secondary care specialist, as part of long-term monitoring by Hepatitis Foundation of NZ, or as recommended by an agreed local pathway.* • Surveillance of known abdominal aortic aneurysm according to local HealthPathway, or if none available according to the according to New Zealand Vascular Society guidelines (2015) [*1] or secondary care specialist advice • Follow up of incidental finding on imaging (including gallbladder polyps) according to the Incidental Findings on Imaging HealthPathway, or if unavailable according to the radiology report advice from the Primary Care Radiology Liaison	RACP Surveillance for liver cancer in primary care	*Hepatitis Foundation Clinician
Alternative management or HealthPathway recommended	• Upper abdominal non-pulsatile mass, not consistent with hepatomegaly – discuss with Primary Care Radiology Liaison or relevant secondary care specialist as referral for CT abdomen may be more appropriate. • Unexplained weight loss, persistent fatigue, vague abdominal pain and suspicion of underlying malignancy – See local CT Chest, Abdomen and Pelvis HealthPathway. • Isolated raised GGT less than 5 times the ULN - Re-test after three months with interim alcohol abstinence. Consider ultrasound if GGT is higher than 5 times the ULN on re-testing.		

	• ALP elevated with normal GGT - suggests ALP increase is probably not liver-related. If ALT or bilirubin elevated as well, or the patient is symptomatic consider ALP iso-enzyme testing to confirm liver origin. • Raised ferritin – See local Raised Ferritin or Hereditary Haemochromatosis HealthPathways • Isolated raised bilirubin – Gilberts syndrome with unconjugated hyperbilirubinemia is the most common cause – See local Abnormal Liver Function Tests HealthPathway. • Dyspepsia – See local HealthPathway • Suspected colorectal neoplasm. If colicky vague abdominal pain, with or without distension, and change in bowel habit, consider colorectal cancer - See local Colorectal Symptoms HealthPathway. • New unilateral lymphoedema - discussion with secondary care recommended as referral for CT is usually preferable • Suspected or symptomatic chronic pancreatitis – request acute general surgery assessment. • Urinary tract presentations and suspected renal abnormality - See local Ultrasound Renal HealthPathway • Isolated bloating with associated clinical symptoms (for example decreased appetite, weight loss, abdominal pain, abnormal vaginal bleeding), seek advice from the appropriate specialist as a CT or US may be indicated.		

Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.	• Hernia in adults
	• Infective hepatitis
	• Follow-up imaging of previously diagnosed gallstones in asymptomatic patients
	• Isolated bloating with no other features of concern
	• Follow up imaging of simple renal or hepatic cysts
	• Screening for:
	  ○ aortic aneurysm
	  ○ fatty liver		

US Carotid - Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Refer for acute assessment without initial imaging	*Guidance:* *Recommended best practice (NICE 2019) is for all patients with suspected TIA, who after specialist assessment are considered as candidates for carotid endarterectomy, to have urgent carotid imaging.* *The choice of modality i.e. ultrasound or CT angiography (CTA) or MR angiography (MRA) should be based on local expertise and availability.* *Carotid imaging is preferably completed at the same visit as brain imaging.*	NZ Guidelines Group Stroke 2012	GP & UC Doctors / NPs

	• All patients with suspected TIA with at least one of the following:
	  ○ A high seven day stroke risk*
	  ○ Suspected TIA with associated neck pain or headache (may indicate an underlying arterial dissection)
		1) Review and advice from Professor. Anna Ranta and Dr Alan Davis (Co-lead national Stroke Network)	

Acute: Within 48 hours	Suspected TIA AND ALL of the following criteria:
	• The suspected TIA episode occurred within the last 2 weeks.
	• Symptoms are consistent with an anterior circulation TIA.
	• The patient:
	  ○ does not have any high risk indicators or suspicion for underlying dissection
	  ○ does not have atrial fibrillation at the time of presentation or any symptoms suggestive of a posterior circulation TIA
	  ○ is not taking anticoagulants
	  ○ is a potential candidate for carotid endarterectomy.
	• Acute stroke specialist assessment is not available.
	• And any one of the following:
	  ○ Carotid ultrasound in the community has been recommended by a neurologist or stroke specialist.
	  ○ Completion of the bpacnz clinical module stroke/TIA tool indicates carotid imaging in the community is appropriate.
	  ○ bpacnz clinical module stroke/TIA tool is not available but the patient has been assessed as suitable for being managed in the community, i.e. the patient meets all of the other criteria above.
		1)i-Refer
		2) Canterbury Community HealthPathway
		3) Appropriateness of general practitioner imaging requests for transient ischaemic attack patients: secondary analysis of a cluster randomised controlled trial (csiro.au)	

		4) Review and advice from Professor. Anna Ranta and Dr Alan Davis (Co-lead national Stroke Network)	
Alternative management or HealthPathway recommended.	• Manage all other TIA presentations according to the Transient Ischaemic Attack (TIA) pathway		

Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios.
Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.
	• Carotid endarterectomy is not publicly funded for asymptomatic stenosis so carotid imaging is not funded for:
	  ○ Asymptomatic bruits
	  ○ Carotid artery calcification on X-ray
	• Screening tests		

*High seven-day stroke risk:

- Seven days or less since episode plus one or more of:
  - ABCD2 score of 4 or higher
  - Anticoagulant use
  - New or pre-existing atrial fibrillation or paroxysmal atrial fibrillation
  - Carotid stenosis on the affected side (known)
  - Crescendo TIA e.g., two or more suspected TIAs within the last seven days
  - Unilateral arm weakness

US DVT - Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Acute: Within 24 hours	• Superficial venous thrombosis affecting the proximal long saphenous vein in the thigh, • Clinically suspected upper limb DVT • Same day DVT US recommended by Health NZ Haematology service or other secondary care specialist	HealthPathways Well's Criteria for DVT (mdcalc.com) HealthNZ Haematologist advice (E. Merriman, L. Young, O'Keefe)	GP & UC Doctors / NPs

Acute: Within 48 hours	• Clinically suspected lower limb DVT and one or more of the following:
	  ○ Well's score of 2 or greater [1]
	  ○ Well's score less than 2 and positive D-dimer [1]		

S1: Time sensitive imaging that must be completed within 1 week of a specified target date.	• No DVT seen on initial ultrasound but where clinical suspicion remains high AND there is high likelihood on Well's score (i.e. 2 or higher). Arrange the follow-up scan for 5 - 8 days after the initial scan. • To check for proximal clot extension in a calf DVT not being treated with anticoagulation, between 5 - 8 days after initial scan. • Secondary care clinician or Radiologist advises referral for follow up ultrasound DVT	Recommendations | Venous thromboembolic diseases: diagnosis, management and thrombophilia testing | Guidance | NICE	
S2: Time sensitive imaging that must be completed within 2 weeks of a specified target date.	• Follow up scan after anticoagulation therapy as recommended by secondary care specialist.		
Alternative management or HealthPathway recommended.	• Children aged younger than 15 years – see local DVT HealthPathway • Pregnant women – see local DVT HealthPathway.		

Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. **Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.**	• Routine follow-up scanning to confirm clot resolution - this does not typically assist with decisions on duration of anticoagulation. • Superficial venous thrombosis, unless affecting the proximal long saphenous vein in the thigh		

US Guided FNA / Core Biopsy- Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for urgent US-guided FNA / core biopsy		GP & UC Doctors / NPs
P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for non-urgent US-guided FNA / core biopsy		

US Musculoskeletal incl. Shoulder - Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
	Guidance: *70 % of shoulder pain in general practice can be attributed to the rotator cuff complex. Rotator cuff tendonitis is the most common underlying pathology and most likely diagnosis in the absence of demonstrated weakness on examination.* *Most presentations with shoulder pain and suspected rotator cuff pathologies, including smaller tears will resolve with conservative management and do not require imaging.* *Initial management should always include a 2 – 3 month trial of physiotherapy.* *Furthermore, radiology is not a pre-requisite for a trial of steroid injection when a full clinical assessment has been undertaken and red flags excluded.* *There is no routine direct access to publicly funded (non-ACC) shoulder or other musculoskeletal ultrasound. Ultrasound findings alone do not typically change the management approach.* *If there is inadequate response to physiotherapy (+/- cortisone injection) management advice may be sought from secondary care and imaging requested on their recommendation or a case for imaging made to the Primary Care Radiology Liaison*	Rotator Cuff Injuries & Physiotherapy Rehab Exercises (mrsphysiotherapy.nz) shoulder-treatment-guidelines-acc1616.pdf	GP & UC Doctors / NPs
P3-P4 Ranges from non-deferrable imaging that must be completed within 6 weeks to deferrable, within 6-12 weeks	• Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for non-urgent shoulder or another musculoskeletal ultrasound.		
Alternative management or HealthPathway recommended.	• Shoulder pain with reduced passive range of motion and frozen shoulder is suspected – see local Shoulder Pain HealthPathway		

Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.	• Achilles or other tendon pain • Bakers Cyst / Knee Cyst • Plantar fasciitis • Forefoot pain –suspected Morton's neuroma • Tennis elbow • Golfer's elbow • Tenosynovitis • Trochanteric pain (Gluteal tendinopathy)		

*1 Red flags:

- Fever, systemically unwell
- Persistent night pain waking from sleep
- Pain at rest
- Restricted passive movement
- Inflammation, swelling

US Neck/Thyroid - Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
	Guidance: *Ultrasound is of limited value in the diagnostic work up of thyroid and neck masses. It can help confirm the origin of the mass and provide some characterisation but for palpable masses, fine needle aspiration (FNA - preferably ultrasound-guided) provides better diagnostic accuracy than ultrasound alone and is the preferred initial diagnostic approach where this is available.* *Ultrasound evaluation of the thyroid reveals nodules in up to 65% of adults, depending on age and gender. The large majority are benign nodules. Thyroid cancer occurs in 7 - 15% of thyroid nodules.* *85% of these are papillary cancers which don't cause any ill-health or affect longevity and there is therefore no benefit in finding these cancers. Approximately 5% of thyroid nodules will harbour an important thyroid cancer (i.e. one that is likely to cause ill health in the future).* *The challenge is to identify the few clinically important cancers (medullary, anaplastic) but avoid using a lot of scarce resource working up all incidentally discovered nodules.* *These confounders limit evidence basis for developing management guidelines and current guidelines are therefore necessarily largely expert opinion based.*	Thyroid fine needle aspiration (FNA) - InsideRadiology	GP & UC Doctors / NPs

P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Palpable thyroid nodule with suspicious features - painless rapid growth over 2 - 3 months, unexplained voice changes, youth/child, family history of MEN (Multiple Endocrine Neoplasia) syndrome, enlarged neck lymph nodes and local pathway or secondary care specialist recommends referral for ultrasound.
	
	• FDG-avid incidental thyroid nodule on PET-CT scan of any size
	
	• Undifferentiated, solitary, non-pulsatile, neck mass which is:
	  ○ present for more than three weeks
	  AND
	  ○ is larger than 1cm in diameter
	  AND
		Sonographic risk stratification of FDG-avid thyroid nodules using the Thyroid Imaging Reporting and Data System - PubMed (nih.gov)	

	○ has no obvious cause • Urgent Ultrasound Neck or Thyroid recommended by a secondary care clinician, primary care radiology liaison (PCRL), or radiologist		
P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Palpable thyroid nodule, no suspicious features, euthyroid, initial imaging • Non-urgent Ultrasound Neck or Thyroid recommended by a secondary care clinician, primary care radiology liaison (PCRL), or radiologist		
P4 Deferrable. If capacity is constrained could wait up to 6-12 weeks from receiving referral.	• Solitary, impalpable, incidental thyroid nodule (ITN) on CT or MR imaging, thyroid stimulating hormone (TSH) is normal or elevated and either: ○ Nodule size larger than 10 mm in patient aged younger than 35 years or ○ Nodule size larger than 15mms in patient aged 35 years and older, or ○ Nodule of any size with adverse features on CT or MR imaging, • Multiple incidental thyroid nodules on CT or MR imaging, and TSH is normal or elevated, and one or more nodules measures 20mms or more in longest diameter		
S2 non-deferrable imaging that must be completed within 2 weeks of a specified target date.	• Non-Urgent, Deferrable Ultrasound Neck or Thyroid recommended by a secondary care specialist, primary care radiology liaison (PCRL), or radiologist • Follow up ultrasound as recommended by local pathway or a secondary care specialist or radiologist for a high-risk thyroid nodule previously identified on ultrasound, CT scan, or MRI.		
Alternative management or HealthPathway recommended.	• Multiple neck masses / suspected metastatic lymphadenopathy – investigate and refer as per the Neck Lumps in Adults HealthPathway • Incidental thyroid nodule on CT scan or MRI and TSH reduced – refer for nuclear medicine Tc-99m pertechnetate scan • Goitre or diffuse thyroid swelling with severe obstructive symptoms e.g. stridor, wheezing at rest – refer for acute secondary care assessment as per local HealthPathway • Goitre or thyroid mass with mild to moderate obstructive symptoms – See local Goitre HealthPathway • Thyrotoxicosis / Hyperthyroidism – See local Hyperthyroidism HealthPathway • Hypothyroidism – See local Hypothyroid HealthPathway		

	• If the patient's presenting symptoms do not meet the accepted criteria, but an ultrasound may be indicated, seek advice from the Radiology Primary Care Liaison or relevant secondary care specialist		
Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. **Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.**	• ITN in patient with co-morbidities and limited life expectancy – imaging work up not recommended • Solitary ITN on CT or MR imaging smaller than 10 mm in diameter and without adverse imaging or clinically suspicious features • Multiple nodules all smaller than 20 mm in diameter and without any adverse features on CT or MR imaging and likely to be benign		

US Pelvis -Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Refer for acute assessment without initial imaging	• Clinically unstable patients with suspected gynaecologic or pelvic cause		GP & UC Doctors / NPs
Acute: Within 24 hours	*Guidance:* *In the acute pelvic pain presentation, the use of ultrasound as a "rule out" investigation is limited - thus the acuity of the presentation (and the expected management required) should remain the determining factor in referral to hospital vs community management.* *If the patient requires hospital assessment regardless of the ultrasound result, a community–provided acute demand ultrasound is typically not warranted unless specifically advised by a secondary care specialist.* *In suspected ovarian / adnexal torsion (difficult to diagnose clinically with variable symptoms / signs) US has a good specificity (85-90%) but lower sensitivity (75-80%) i.e. negative predictive value.* *In suspected ovarian cyst "accidents" (i.e. rupture or haemorrhage of physiologic cysts) free fluid in the pelvis and partial or complete cyst collapse may be observed, but not always.* *Pelvic Inflammatory Disease (PID) remains the most common cause of acute pelvic pain. It is commonly associated with a normal ultrasound and is typically considered a clinical diagnosis.*		

	• Patients acutely unwell from a suspected gynaecological cause including:
	  ○ sudden onset of severe pelvic pain, clinically stable and suspected ovarian torsion or ovarian cyst accident (e.g. cyst rupture or bleed)
	  ○ possible endometritis from RPOC [*1] in women with persistent pelvic pain and tenderness, +/- low grade fever, +/- bleeding; where the patient is outside the two-week post miscarriage maternity-funded scan window. Consider seeking gynaecology advice or acute gynaecology assessment if admission may be more appropriate.		

	• IUD strings missing and not visible on examination, or IUD breaks on removal attempt and only a fragment is removed, and the patient presents with symptoms suggestive of possible perforation including cramping pain, discharge, unexplained bleeding.		
Acute: Within 48 hours	• Suspected ongoing pregnancy more than 14 days post abortion or miscarriage and either: ○ Urine HCG is greater than 1000 IU on testing at 14 days post-procedure, miscarriage, or early medical abortion (EMA) OR ○ Serial serum *b*HCG remains high after early medical abortion (EMA) or miscarriage especially if *b*HCG has increased between a baseline test done within 72 hours of Mifepristone and a follow-up test 8-16 days after ingestion (N.B. a decrease in serum *b*HCG of 80% or more between baseline and follow-up tests excludes ongoing pregnancy). ○ +/- Ongoing symptoms of pregnancy (e.g. nausea, breast tenderness) • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for same or next day ultrasound pelvis	HealthPathway Canterbury HealthPathway Lead Region-Abortion HealthPathway Lead Region – Pain and Bleeding in Early Pregnancy	
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Pelvic mass on examination suspicious of cancer • Postmenopausal bleeding (i.e. vaginal bleeding after more than 12 months' amenorrhoea around the expected age of menopause (approximately 50 years)). • Persistent postmenopausal bleeding at any age, while on continuous combined menopause hormone therapy (MHT), and it has been more than 6 months since starting therapy. • No palpable pelvic mass but new abdominal or pelvic symptoms[*2] warranting consideration of ovarian cancer which are present on a persistent or frequent basis and the Ca-125 result is 35 units/mL or greater, irrespective of menopause status. • Abnormal uterine bleeding (AUB) [*3] and non-uterine causes have been excluded[*4], and either: • Woman of any age, with abnormal uterine bleeding and at least two risk factors[*5] for EH/EC OR • A pelvic mass is suspected on examination, and no prior imaging has been done since the onset of symptoms.	https://bpac.org.nz/2023/ovarian-cancer.aspx	

	• Atypical (AG2) endometrial cells reported on cervical screening cytology result in women of any age and menopause status. • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for urgent US pelvis.		
	Guidance: *Māori and Pacific Peoples are disproportionately affected by endometrial cancer (EC) and endometrial hyperplasia (EH). Investigations including transvaginal ultrasound and/ or aspiration endometrial sampling should be considered at or soon after initial presentation for all Māori and Pacific people presenting with abnormal uterine bleeding (AUB)*	Body mass index trumps age in decision for endometrial biopsy: cohort study of symptomatic premenopausal women (ajog.org) Beavis, A.L., et al., Identifying women 45 years and younger at elevated risk for endometrial hyperplasia or cancer. Gynecol Oncol, 2023. 174: p. 98-105.	

P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Women aged 45 years or older with AUB and non-uterine causes have been excluded[*4].
	
	• Women aged younger than 45 years with AUB and one or more risk factors for EH/EC[*5]
	
	• Women aged younger than 45 years who have not responded to first-line treatment for AUB trialled for at least three months.
	
	• Perimenopausal woman, on combined cyclical MHT, with ongoing irregular bleeding, or bleeding outside the time of progestogen withdrawal,
	  ○ AND despite a trial of increased progestogen,
	  ○ AND it has been more than 6 months since starting MHT.
	
	• Benign-appearing endometrial cells reported on cervical smear and at least one of:
	  ○ The patient is post-menopausal (no period for twelve consecutive months)
	  ○ The patient is symptomatic (e.g. intermenstrual, post-coital, irregular or heavy bleeding)
	  ○ The patient has at least one risk factor for EC or EH[*5]
	
	• No palpable pelvic mass but new abdominal or pelvic symptoms [*2] warranting consideration of ovarian cancer are present on a persistent or frequent basis for more than 6 weeks AND the patient has not been recently investigated.
	
	• Suspected ovarian cyst and either:
	  • unilateral pelvic pain for more than four weeks and/or unilateral tenderness, or
	  • pelvic mass and low suspicion of cancer.		

	• Pelvic pain for more than six weeks, unrelated to menstrual cycle, and with pelvic inflammatory disease (PID) excluded as the cause of the pain as per local PID HealthPathway. • Primary amenorrhoea (i.e. absence of menarche by age 16 years, or age 14 years if absent secondary sexual characteristics) • IUD strings not visible on exam or IUD breaks on removal attempt and fragment only removed and patient is asymptomatic. • Dysmenorrhoea - (secondary) new onset dysmenorrhoea and debilitating pain persists despite a three-month trial of medical management as per local Dysmenorrhoea HealthPathway. • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for routine ultrasound pelvis.		
P4 Deferrable. If capacity is constrained could wait up to 6-12 weeks from receiving referral.	• Polycystic ovary syndrome (PCOS) suspected, but only one of the three Rotterdam diagnostic criteria (i.e. hyperandrogenism, polycystic ovaries, irregular menses) fulfilled. • Known fibroid larger than 5cms which becomes symptomatic with pelvic pressure, back pain, dyspareunia, or urination difficulties after commencing MHT. • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for deferrable, non-urgent ultrasound pelvis.	PCOS summary guideline	
S2 non-deferrable time sensitive imaging or intervention that must be completed within 2 weeks of a specified target date.	• 6-month follow-up scans of O-RADS 2 ovarian or adnexal cysts, in both pre- and post-menopausal woman according to the ACR published table or ACR mobile phone app. • Follow up scans of haemorrhagic cyst in pre-menopausal woman according to the ACR published table or ACR mobile phone app. • Follow up scan of asymptomatic endometrial polyps detected as incidental finding on US in a patient without risk factors for EH/ EC as per local Incidental Findings in Imaging HealthPathway. • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for time-sensitive, specified date, follow-up ultrasound of the pelvis	O-RADS US v2022: An Update from the American College of Radiology's Ovarian-Adnexal Reporting and Data System US Committee | Radiology (rsna.org)	

S3 non-deferrable time sensitive imaging or intervention that must be completed within 6 weeks of a specified target date.	• 12-month follow-up scans of O-RADS-2 ovarian or adnexal cysts, in both pre- and post-menopausal woman according to the ACR published table or ACR mobile phone app • 12 month follow up scan of suspected dermoid cyst in pre-menopausal woman according to the ACR published table or ACR mobile phone app • 12 month follow up scan of suspected asymptomatic endometrioma in pre-menopausal woman according to the ACR published table or ACR mobile phone app • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for time–sensitive, specified date follow-up ultrasound of the pelvis	O-RADS US v2022: An Update from the American College of Radiology's Ovarian-Adnexal Reporting and Data System US Committee | Radiology (rsna.org)	
Alternative management or HealthPathway recommended.	• Suspected retained products of conception (RPOC) with persistent or heavy bleeding after abortion or miscarriage - See local Abortion HealthPathway or Miscarriage HealthPathway. • Suspected endometriosis in the absence of a clinically palpable mass - See local Endometriosis HealthPathway. • Primary dysmenorrhoea in the absence of a clinically palpable mass - See local Dysmenorrhoea HealthPathway. • Pelvic inflammatory disease (PID) in the absence of a clinically palpable mass - See local PID HealthPathway. • Cervical polyps - referral to secondary care rather than ultrasound is recommended for women with polyps which prove difficult to remove. Ultrasound is not able to identify the rare occurrence of malignant polyps - See local Endometrial Polyps HealthPathway. • Secondary amenorrhoea. Pelvic USS is not normally helpful in diagnosing secondary amenorrhoea unless a pelvis mass is present, or the patient has significantly raised androgens which would raise concern regarding an ovarian tumour.		

Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. **Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.**	• Routine follow-up of known fibroids • Subfertility • Follow-up of asymptomatic, simple ovarian cyst (O-RADS 2) less than 3 cm in diameter in post-menopausal woman • Follow-up of asymptomatic, simple ovarian cyst (O-RADS 2) less than 5 cm in diameter in premenopausal woman • Follow-up of asymptomatic, non-simple ovarian cyst less than 3 cm diameter in premenopausal woman • Follow up of typical-appearing haemorrhagic cyst up to 5cms diameter in pre-menopausal woman. • Benign-appearing endometrial cells on smear in asymptomatic, pre-menopausal women, no abnormality on exam and without any risk factors[*5] for endometrial hyperplasia or cancer • Erratic, unscheduled bleeding in the first 3 to 6 months after starting MHT. • Screening ultrasound scan for a family history of ovarian cancer. All women with Lynch Syndrome, Hereditary non-polyposis colorectal cancer (HNPCC), or Cowden Syndrome, or BRCA gene mutations associated with increased ovarian cancer risk should be referred to secondary care for assessment and management. There is insufficient evidence to warrant routine pelvic US screening in asymptomatic women. • Women aged less than 45 years with abnormal uterine bleeding and no risk factors for endometrial hyperplasia or endometrial cancer, no abnormality on examination and where first line treatment has not been trialled.	1)i-Refer RCR UK 3D HealthPathways 2)Canterbury HealthPathways 3)MoH Comm Rad Criteria 2015	

*1 Patients with suspected endometritis i.e. suspected infection with ongoing pelvic pain post-partum, miscarriage or abortion, uterine tenderness, with or without fever and/or bleeding but systemically stable. If systemically unstable and/or severe persistent pelvic pain refer for acute assessment without requesting imaging

*2 Presentations warranting consideration of ovarian cancer, in the absence of a palpable mass - new abdominal or pelvic symptoms which are present on a persistent or frequent basis:
- Persistent abdominal distension or bloating
- Early satiety or loss of appetite
- Pelvic or abdominal pain without a known cause
- Increased urinary urgency or frequency
- Irritable bowel symptoms, especially if new onset and aged older than 50 years
- Unexplained weight loss or fatigue

*3 Abnormal Uterine Bleeding (AUB) –bleeding from the uterus that is abnormal in volume, regularity, frequency or duration and occurs in the absence of pregnancy (excluding postmenopausal bleeding) The condition may be acute (urgent referral) or chronic (experienced for 6 months or more).

- Volume – Heavy Menstrual Bleeding - excessive menstrual blood loss which interferes with a woman's physical, social, emotional and or material quality of life
- Regularity - 10 days or more variation between the longest and the shortest cycles. Higher variability is commonly seen in adolescence and in peri-menopause.
- Duration - Prolonged menstrual bleeding – lasting more than 8 days
- Frequency
  - Secondary amenorrhoea where bleeding occurs less than every 90 days or more
  - Infrequent menstrual cycles - less than every 38 days
  - Frequent menstrual cycles - more than every 24 days

- Other
  - Intermenstrual bleeding (IMB) is spontaneous bleeding occurring between regular menstrual periods. This may be cyclical (predictable) or random.
  - Post-coital bleeding - refers to spotting or bleeding that occurs after intercourse and is not related to menstruation
  - Unscheduled bleeding - unexpected bleeding while on hormonal medication (progestogen-only or combined oestrogen and progestogen) e.g. for women using cyclic progestins bleeding outside the time of progestin withdrawal is atypical and requires investigation.

*4 Non-uterine i.e. lower genital tract causes of bleeding

- Vulvovaginal atrophy / atrophic vaginitis
- Vulval dermatoses
- Sexually transmitted infections e.g. chlamydia
- Malignancy of cervix, vagina, vulva
- Cervical ectropion
- Urethral causes e.g. urethral caruncle

*5 Risk factors for EH/EC

Priority group and equity considerations: For Māori and Pacific peoples, investigations to exclude endometrial cancer and hyperplasia should be considered at, or soon after, the initial presentation of abnormal uterine bleeding (AUB). Māori and Pacific peoples have a significantly higher rate of endometrial hyperplasia and cancer (relative risk (RR) of 2.47 and 5.11 respectively compared with other ethnicities).

Clinical risk factors:

- Excess estrogen exposure:
  - Endogenous:
    - BMI 30 or higher – the risk is directly proportional to the BMI
    - Polycystic ovary syndrome (PCOS)
    - Chronic anovulation (e.g. fewer than 4 menstrual cycles in 12 months)
    - Nulliparity in women older than 35 years
    - Early menarche (variably defined as earlier than 10 to 12 years of age) or late menopause (after age 55 years)
    - Estrogen-secreting tumour
  - Exogenous:
    - Long-standing unopposed estrogen menopause hormone therapy (MHT)
    - Tamoxifen therapy

- Diabetes mellitus
- Iron deficiency anaemia (Hb less than 100)
- Family history of endometrial, ovarian, breast, or bowel cancer

US Renal - Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Refer for acute assessment without initial imaging	• Consider admission or seek advice for Pyelonephritis where presentation with fever (higher than 38 degrees), pyuria on microscopy, loin pain or tenderness, +/- lower UTI symptoms and: ○ not responding to antibiotics after 72 hours and abscess development is a consideration, or ○ flank pain that does not improve within 24 hours of IV or 48 hours of oral antibiotics		GP & UC Doctors / NPs
Acute: Within 48 hours	• First presentation of renal colic if pregnant or female younger than 35 years old and no red flags* requiring admission. • Suspected chronic urinary retention e.g. new onset incontinence with palpable enlarged bladder • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for acute ultrasound renal	Canterbury HealthPathway	
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Macroscopic haematuria: ○ If younger than 40 years or aged 86 years and older. ○ If aged 40 to 85 years and unable to have intravenous contrast (i.e. history of allergy to IV contrast, has an eGFR less than 30mL/min, is taking metformin, or has hyperthyroidism). • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for urgent ultrasound renal	Development and validation of a haematuria cancer risk score to identify patients at risk of harbouring cancer - Tan - 2019 - Journal of Internal Medicine - Wiley Online Library	
P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Microscopic haematuria, male patient, older than 50 years, current or ex-smoker • New diagnosis of chronic kidney disease (CKD) and any of: ○ eGFR less than 30 ○ eGFR less than 45 with diabetes ○ eGFR less than 60 with evidence of progressive disease (i.e. eGFR decreased by 15 or more within the previous 12 months), ○ ACR more than 250	Microhematuria: AUA/SUFU Guideline - American Urological Association (auanet.org) Assessment of non-visible haematuria - Differential diagnosis of	

	• New right-sided or bilateral varicocele.
	• UTI in men (*including pyelonephritis where admission is not required)
	  ○ recurrent UTI (i.e. 2 or more confirmed UTI)
	  ○ persistent UTI (i.e. if urine culture shows persistent bacteriuria with same organism following treatment with appropriate antibiotic, consider colonisation of renal tract stone). Arrange Xray KUB and pre- and post-void renal ultrasound.
	• UTI in women (*including pyelonephritis where admission is not required)
	  ○ recurrent UTI (i.e. more than 3 UTIs in a year, or more than 2 in six months despite prophylactic antibiotics.)
	  ○ Persistent UTI i.e. if urine culture shows persistent bacteriuria with same organism following treatment with appropriate antibiotic, consider colonisation of renal tract stone. Arrange Xray KUB and pre- and post-void renal ultrasound.
	• Urinary incontinence in men with palpable bladder, or new or deteriorating renal impairment.
	• Recurrent loin pain suggesting renal tract obstruction other than renal stone.
	• Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for non-urgent ultrasound renal.
		symptoms | BMJ Best Practice
		
		Non-visible haematuria for the Detection of Bladder, Upper Tract, and Kidney Cancer: An Updated Systematic Review and Meta-analysis - PubMed (nih.gov)
		
		Swedish - long term follow up ob study - microscopic haematuria.pdf
		
		Haematuria (Remedy BNSSG ICB)
		
		haeumaturia-in-adults.pdf (scot.nhs.uk)
		
		Reliability of the IDENTIFY calculator in stratifying risk of urothelial carcinoma in patients with haematuria: An initial evaluation at an Australian centre - Rival - 2024 - BJUI Compass - Wiley Online Library	

P4 Deferrable. If capacity is constrained could wait up to 6-12 weeks from receiving referral.	• Microscopic haematuria, male patient, older than 50 years who is a non-smoker • Microscopic haematuria, male patient aged 50 years and younger, with any smoking status (current or ex-smoker, or non-smoker) • Microscopic haematuria, female, of any age and smoking status		

S2 non-deferrable time sensitive imaging to be completed within 2 weeks of a specified target date	• Follow up, according to the Renal Colic and Urinary Tract Stones HealthPathway, if calculus not visible on KUB X-ray (provided BMI is less than 30)		
Alternative management or HealthPathway recommended.	• Incidental finding on ultrasound of a solid lesion more than 1 cm diameter with typical ultrasound appearances of an angiomyolipoma – see local CT IVU HealthPathway • Macroscopic haematuria in patients who do not have a UTI, if aged 40 to 85 years. Refer for CT IVU (Intravenous Urogram). • Repeat renal ultrasound for diabetic patients with known diabetic renal complications is not indicated - See local Kidney Disease in Diabetes HealthPathway • Suspected renal colic in a non-pregnant person – See local Renal Colic and Urinary Tract Stones HealthPathway. • Acute kidney injury – manage according to Acute Kidney Injury pathway, or seek advice from the relevant secondary care specialist as to whether a renal ultrasound is indicated • Enlarged prostate or elevated PSA – See local Prostate Cancer Diagnosis HealthPathway. • Isolated proteinuria – seek nephrology advice. • Lower urinary tract symptoms - See local Lower Urinary Tract Symptoms (LUTS) or Benign Prostatic Hypertrophy HealthPathway, or other relevant HealthPathway. • Abdominal mass - Discuss with secondary care specialist as FSA, CT scan or other investigations may be more appropriate	Machine Learning and External Validation of the IDENTIFY Risk Calculator for Patients with Haematuria Referred to Secondary Care for Suspected Urinary Tract Cancer - PubMed (nih.gov)	
Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. **Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.**	• Recurrent UTIs in women, except as documented above • Investigation of uncomplicated hypertension • Bacteriuria in patients with in-dwelling catheters who are not systemically unwell • Follow-up imaging of simple renal cysts (Bosniak I and II) • Follow up of incidental finding on ultrasound of a solid lesion less 1 cm diameter with typical ultrasound appearances of an angiomyolipoma.		

	• Screening scan for Autosomal Dominant Polycystic Kidney Disease (ADPKD) • Serial ultrasounds of known polycystic kidneys unless indicated by the radiology report, or the patient develops new symptoms that meet any of the other criteria for renal ultrasound		

*[1] Red flags for renal colic:

- Creatinine > 160 micromol/L or eGFR < 45 mL/min;
- solitary kidney;
- temperature > 38 degrees;
- peritonitis;
- signs of sepsis;
- known bilateral ureteric stones

US Scrotum / Testis

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Refer for acute assessment without initial imaging.	• Suspected testicular torsion. • Strangulated inguinal hernia		GP & UC Doctors / NPs
Acute: Within 48 hours	• Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for acute ultrasound		
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• High suspicion of testicular cancer (e.g. rapidly growing mass, non-transilluminating, not able to distinguish the mass from the testis, painless) • New hydrocoele in adults (may be secondary to testicular cancer) • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for urgent ultrasound		
P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Scrotal lumps, if it is unclear whether the swelling is testicular or extra-testicular, and is non-transilluminating • Epididymo-orchitis which fails to respond to antibiotic treatment after 7-10 days • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for non-urgent ultrasound		
P4 Deferrable. If capacity is constrained could wait up to 6-12 weeks from receiving referral.	• Scrotal lumps larger than 5 cm (for example hydrocele), causing a significant impairment in quality of life (affecting employment and/or activities of daily living), and patient is seeking surgery. • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for deferrable, non-urgent ultrasound.		
Alternative management or HealthPathway recommended.	• New right sided or bilateral varicocele – arrange renal US to exclude renal cancer with inferior vena cava (IVC) involvement		

Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. **Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.**	• Non-solid (transilluminating) scrotal masses smaller than 5 cm • Long-standing hydrocele in adults • Routine follow-up of testicular microlithiasis • Haematospermia - almost always benign and self-limiting • Uncomplicated epididymo-orchitis • Orchalgia (i.e. chronic testicular or scrotal pain in the absence of any abnormality on examination) • Scrotal pearls or stones (calcified extra-testicular loose bodies)		

US Soft Tissue Mass -Adult

	Referral Criteria and Prioritisation Timeframes		
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Acute: Within 48 hours	• Localisation of a suspected foreign body for removal (only if not eligible for ACC funding)		GP & UC Doctors / NPs

P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• New lump on trunk or limbs, with any of the following features (N.B. soft tissue sarcomas are frequently slow growing and painless) **
	  ○ deep to deep fascia, fixed, hard, irregular of any size
	  ○ larger than 5cm
	  ○ changing rapidly
	  ○ painful
	  ○ recurring after a previous sarcoma excision
	• Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for urgent ultrasound.		

P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• New lump on trunk or limbs, and either
	  ○ superficial, mobile, and larger than 5 cm in diameter with uncertain diagnosis, or
	  ○ smaller than 5 cm diameter and uncertain whether deep to fascia (fixed)
	• Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for non-urgent ultrasound.		

Alternative management or HealthPathway recommended.	• Localisation of a suspected foreign body for removal and eligible for ACC funding – use ACC funding • Isolated neck lumps or enlarged lymph node - See local US Thyroid / Neck HealthPathway • Isolated enlarged axillary lump, which is presumed to be a lymph node - See local Breast Symptoms HealthPathway • Suspected breast abscess - See local Mastitis and Breast Abscess HealthPathway • Breast lumps - See local Breast Symptoms HealthPathway.		

Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. **Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.**	• Soft tissue mass with characteristic appearance of lipomas, ganglions, cysts and no concerning features. • Suspected abscess - See local Soft Tissue Abscesses HealthPathway		

Adult X-ray

X-ray Abdomen - Adult

	Referral Criteria and Prioritisation Timeframes		
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Refer for acute assessment without initial imaging	• Acute abdomen including suspected obstruction		GP & UC Doctors / NPs
Acute: Within 48 hours	*Guidance:* *As there is wide variation in the amount of normal faecal residue shown, abdominal X-ray does not reliably diagnose constipation nor should be used for monitoring response to treatment.* *The sensitivity and specificity of AXR is low in both the diagnosis and identifying underlying cause of bowel obstruction. As a more definitive test, CT is preferable and AXR may result in delays to a more definitive test such as CT.*		
	• Diagnosis of constipation where patient history is unobtainable. • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for acute x-ray.	i-refer	
P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Persistent lower UTI or pyelonephritis and bacteria confirmed on MSU, despite treatment with appropriate antibiotic – consider colonisation of a renal tract stone and request both a pre- and post-void renal ultrasound and a KUB X-ray. IUD Removal: • Routine or embedded IUD removal – If a pelvic ultrasound has been performed and the missing IUD part was not seen within the uterus, request a lower abdominal X ray (i.e. pelvis only). • Patient is not pregnant and threads are not visible - If a pelvic ultrasound has been performed and the IUD was not located within the uterus, request a full abdominal X ray, including the pelvis. • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for non-urgent x-ray.		

S2 non-deferrable time sensitive imaging to be completed within 2 weeks of a specified target date	• Follow-up of radio-opaque (i.e. evident on CT scout view) renal tract stones with a kidney, ureter, bladder (KUB) x-ray • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for follow-up x-ray		
Alternative management or HealthPathway recommended.	• Suspected colorectal cancer – See local Colorectal Symptoms HealthPathway	3D HealthPathways Canterbury HealthPathways MoH Comm Rad Criteria 2015	
Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.	• Vague central abdominal pain • Suspected constipation other than in a patient group specified above		

X-ray Chest - Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**

Refer for acute assessment without initial imaging.	• Haemoptysis with "red flags" including if
	  ○ Significant (e.g., more than 20ml (1 tablespoon) in a single episode) or life threatening (e.g., more than 100 ml/hour) haemoptysis
	  ○ Haemodynamically unstable
	  ○ Haemoptysis with hoarseness or stridor
	  ○ Acute dyspnoea and/or chest pain
	• Severe respiratory distress
	• Suspected large pneumothorax with significant pain, breathlessness, tachycardia
	• Suspected active Tuberculosis and the patient is acutely unwell – follow the Tuberculosis pathway
		Canterbury HealthPathway – Chest X-ray
		
		https://www.brit-thoracic.org.uk/document-library/guidelines/pneumonia-adults/quick-reference-guide-bts-guidelines-for-the-management-of-community-acquired-pneumonia-in-adults/
			GP & UC Doctors / NPs

Acute: Within 24 hours	*Guidance:* *In patients with an acute lower respiratory tract infection a chest x-ray does not change the management in most cases.*	https://www.brit-thoracic.org.uk/guidelines-and-quality-standards/community-acquired-pneumonia-in-adults-guideline/annotated-bts-guideline-for-the-management-of-cap-in-adults-2014/	
	• Suspected community-acquired pneumonia (CAP) with unexpectedly severe or atypical presentation, or where the patient is considered at risk of underlying lung pathology (e.g. lung cancer) • Respiratory tract infection with possible left ventricular failure		

Acute: Within 48 hours	• One or more of the following symptoms or signs concerning for lung cancer
	  ○ Unexplained, new, or worsening dyspnoea
	  ○ Unexplained cough, persisting and worsening for more than 3 weeks
	  ○ Unexplained chest and/or shoulder pain
	  ○ Unexplained changes in existing symptoms in patients with underlying chronic respiratory problems persisting for more than 3 weeks		

	○ Persistent, unexplained hoarseness persisting for more than 3 weeks ○ Recurrent or unresolved chest infections ○ Persistent, unexplained haemoptysis in the absence of red flags ○ Unexplained weight loss and loss of appetite persisting for more than 3 weeks ○ unexplained abnormal chest signs persisting more than 3 weeks (e.g. suspected pleural effusion) which have not yet been investigated with imaging ○ New supraclavicular lymphadenopathy ○ New cervical lymphadenopathy persisting for more than 3 weeks, where the lymph nodes are greater than 1 cm in diameter in a patient with other lung cancer symptoms, signs, or risk factors ○ Features suggestive of paraneoplastic syndromes. e.g. hypercalcaemia, hypertrophic osteoarthropathy with painful swollen joints and finger (and toe) clubbing • Subacute dyspnoea of unknown cause, e.g. suspected pleural effusion or left ventricular failure • Lower respiratory tract infection which hasn't responded as expected after 48 hours of antibiotic treatment • Suspected small pneumothorax • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for acute x-ray		
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Suspected tuberculosis - follow the Tuberculosis pathway and request a CXR if indicated • Suspected drug induced lung disease in patients who develop new respiratory symptoms while taking medication which can potentially affect the lungs e.g. Amiodarone, nitrofurantoin, methotrexate. • Idiopathic / unprovoked DVT or PE - as required, to exclude underlying malignancy. • Polymyalgia Rheumatica (PMR) - request CXR for all patients prior to starting steroids, to exclude an alternative cause for their presenting symptoms (e.g. pulmonary pathology, chronic infection, malignancy). Also consider additional targeted imaging if any specific concerns about an underlying malignancy. • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for urgent x-ray		

P3 Non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• For investigation of alternative diagnoses or co-morbidities in patients with non-acute asthma and any of - unclear diagnosis, poor control, or frequent exacerbations • Chronic cough (more than 8 weeks) • Chronic dyspnoea • Known cardio-respiratory disease unresponsive to treatment, for example COPD, ILD, bronchiectasis, sarcoidosis • History of asbestos exposure and no previous chest x-ray • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for non-urgent x-ray		

S2 non-deferrable time sensitive imaging or intervention that must be completed within 2 weeks of a specified target date.	• 6 week follow up chest X-ray after chest infection if the patient has any of:
	  ○ ongoing symptoms or signs
	  ○ suspicious radiological features noted by a radiologist and follow up is recommended
	  ○ when recommended by secondary care clinician or radiologist
	• Post-cancer surveillance with documented specialist recommendation
	• Follow-up of nodules detected on chest X-ray or CT, if recommended by a secondary care clinician or radiologist
	• Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for follow-up x-ray		

Alternative management or HealthPathway recommended.	• Ongoing unexplained respiratory symptoms after a negative chest X-ray result, especially if clinical concern of malignancy, either:
	  ○ Seek secondary care specialist assessment
	  ○ See the local Lung Cancer HealthPathway
	  ○ See the local CT Chest, Abdomen and Pelvis HealthPathway
		3D, Canterbury HealthPathways
		MoH Comm Rad Criteria 2015	

Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. **Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.**	• Routine follow-up of pneumonia findings on chest x-ray, other than in the scenarios specified above under S2 priority imaging • Asbestos exposure surveillance • Heart murmur, unless signs of complications such as heart failure • Lung cancer screening • Follow-up of nodules detected on chest X-ray or CT, except with documented recommendation of a hospital secondary care clinician or radiologist	MoH Comm Rad criteria 2015	

	• The patient may wish to consider privately funded imaging for TB screening in the absence of a positive skin or blood test - See Tuberculosis pathway for additional management advice • Rib views • Chest x-rays for immigration purposes • Routine lateral x-ray view when requesting a PA image • Routine investigation of hypertension • Routine monitoring for asymptomatic patients who are taking medications which may cause drug induced lung disease (e.g. amiodarone, nitrofurantoin, methotrexate).		

X-ray Shoulder and Upper Limb (Humerus, Elbow, Forearm, Wrist/Hand)

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Refer for acute assessment without initial imaging	• Suspected septic arthritis		GP & UC Doctors / NPs

P2 Urgent: Non-deferrable, imaging or intervention that must be completed within 2 weeks of receiving referral	• Pain with red flags:
	  ○ Persistent deep pain unrelated to activity
	  ○ Unexplained night pain
	  ○ Patient has a history of malignancy with propensity to metastasize to bone
	• New, unexplained bony swelling or joint deformity
	• Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for urgent x-ray		

P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	*Guidance:* *Osteoarthritis is typically a clinical diagnosis, and x-ray is not routinely needed to make the diagnosis.* *Imaging is also not required for effective non-surgical management of osteoarthritis.* *There is generally poor correlation between symptoms and x-ray changes i.e. x-rays are poor indicators of the severity of disease except in advanced stages.* *X-rays to help with diagnosis are reserved for patients who present with persisting joint pain and clinical features atypical for osteoarthritis e.g. younger age, (less than 45 years old), pain at rest rather than with activity, persisting stiffness, systemic features*		
	• Undiagnosed elbow, wrist or finger joint pain present more than four weeks and presentation not typical of osteoarthritis[*1] • Shoulder X-ray for undiagnosed pain after 6 weeks - imaging is not a prerequisite for a trial of steroid injection if a clinical diagnosis has been made • Shoulder X-ray for pain unresponsive to 6 weeks conservative management, including a trial of cortisone and / or physiotherapy		

	• Known osteoarthritis with significant functional impairment, if requesting orthopaedic assessment for surgery and no x-ray in last 6 months • Wrist / Hand: ○ joint swelling in the hand / wrist, which involves multiple joints, lasting for more than six weeks and inflammatory arthritis is suspected • Pain in previous arthroplasty • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for non-urgent x-ray		
Alternative management or HealthPathway recommended.	• Acute gout – See local Gout HealthPathway • X-ray Shoulder: ○ Musculoskeletal x-rays requested through acute demand services – if septic arthritis is suspected refer for acute assessment without initial imaging • Shoulder pain with reduced passive range of motion and frozen shoulder is suspected – manage according to the Shoulder Pain or Frozen Shoulder pathway. • Suspected olecranon or other bursitis – manage according to the Shoulder Pain pathway. • Osteomyelitis – discuss with relevant specialist		

Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.	• All upper limb body parts:
	  ○ Follow-up of suspected or known osteoarthritis unless red flags develop, or patient now meets local clinical criteria for surgery
	  ○ Recent onset pain without red flags (i.e. Persistent deep pain unrelated to activity, unexplained night pain)
	  ○ Mild symptoms and normal examination findings
	• X-ray Shoulder only:
	  ○ Loss of range of motion and suspected frozen shoulder unless the condition does not follow its expected natural history
	• X-ray Elbow: Epicondylitis (tennis elbow, golfer's elbow)		

Clinical features atypical for osteoarthritis and suggesting an alternative pathology:

- patient younger than 45 years old
- recent trauma
- prominent signs of inflammation (tender swelling, redness, warmth, early morning stiffness of the joint for more than 30 minutes)

- significant nocturnal pain or pain at rest
- weight loss or systemic symptoms
- inability to weight bear

X-ray –Pelvis/Hip and Lower Limb (Femur, Knee, Tibia/Fibula, Foot/Ankle)

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Refer for acute assessment without initial imaging.	• Suspected septic arthritis.		GP & UC Doctors / NPs
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Pain with red flags: ▪ Persistent deep pain unrelated to activity. ▪ Unexplained night pain. ▪ History of malignancy with propensity to metastasise to bone • New, unexplained bony swelling or joint deformity • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for urgent x-ray.		
P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	*Guidance:* *Osteoarthritis is typically a clinical diagnosis, and X-ray is not routinely needed to make the diagnosis.* *Imaging is also not required for effective non-surgical management of osteoarthritis.* *There is generally poor correlation between symptoms and X-ray changes. X-rays are poor indicators of the severity of disease except in advanced stages.* *X-rays to help with diagnosis are reserved for patients who present with persisting joint pain and clinical features atypical for osteoarthritis e.g. younger age, (less than 45 years old), pain at rest rather than with activity, persisting stiffness, systemic features.* *Always request weight bearing views of knees especially if considering referral for orthopaedic assessment as they give a more accurate picture of joint space narrowing.*		
	• Undiagnosed pain for more than 4 weeks, and there are clinical features not typical of osteoarthritis suggesting an alternate pathology [*1.] • Known osteoarthritis with significant functional impairment, if requesting orthopaedic assessment and no x-ray in last 6 months (request x-ray of the affected joint only) • Pain in previous arthroplasty		

	• Foot/Ankle: ▪ Joint swelling in the ankle / foot (involving multiple joints) for more than 6 weeks and inflammatory arthritis is suspected. Always include details of patient history and investigation results in the referral. • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for non-urgent x-ray		
Alternative management or HealthPathway recommended.	• Acute gout – See local Gout HealthPathway • Osteomyelitis – discuss with relevant specialist		

Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.	• Clinically suspected osteoarthritis, except as above
	• X-ray Pelvis / Hip:
	  ▪ "Trochanteric bursitis." (Gluteus Medius tendinopathy)
	• X-ray knee:
	  ▪ Osgood-Schlatter disease – history and physical examination are usually sufficient to make the diagnosis
	  ▪ Bakers Cyst / Knee Cyst
	  ▪ Bursitis
	  ▪ Sinding Larsen Johansson disease (patellar tendonitis or Jumper's knee)
	  ▪ Patellofemoral pain syndrome, including chondromalacia patella
	• X-ray foot/ankle:
	  ▪ Bunions and bunionettes
	  ▪ Flat feet
	  ▪ Heel pain
	  ▪ Heel spurs
	  ▪ Plantar fasciitis
	  ▪ Suspected Severs Disease		

*1 Clinical features atypical for osteoarthritis and suggesting an alternative pathology:
- patient younger than 45 years old
- recent trauma
- prominent signs of inflammation (tender swelling, redness, warmth, early morning stiffness of the joint for more than 30 minutes)
- significant nocturnal pain or pain at rest
- weight loss or systemic symptoms
- inability to weight bear

X-ray Spine - Adult

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**

Refer for acute assessment without initial imaging	• Suspected spinal infection e.g. back pain and one or more of fever, history of recent infection, IV drug use, immunosuppression - seek acute orthopaedic advice
	
	• Suspicion of cauda equina syndrome i.e. acute back pain with any of:
	  ○ sphincter disturbance
	  ○ gait disturbance
	  ○ saddle anaesthesia
	  ○ loss of bowel or bladder control
	  ○ abnormal reflexes, or loss of muscle power or feeling in the legs
	
	Guidance:
	
	Approximately 90% of acute low back pain episodes presenting to primary care are benign, self-limiting cases that do not warrant x-ray or other imaging studies.
	
	Spinal fracture and malignancy are the most common serious pathologies affecting the spine. In patients with low back pain presenting to primary care, between 1% and 4% will have a spinal fracture and in less than 1% malignancy, either primary or secondary.
	
	The low prevalence of both these in primary care settings does not justify routine ancillary testing of patients presenting with low back pain. Accurate screening tools to aid clinical decisions about when to refer for further testing +/- imaging are paramount.
		Imaging Tests for Lower Back Pain - Choosing Wisely Canada
		
		Don't perform imaging for patients with non-specific acute low back pain and no indicators of a serious cause for low back pain. - Choosing wisely
			GP & UC Doctors / NPs

Acute: Within 48 hours	• Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for acute spine X-ray	Red flags to screen for malignancy and fracture in patients with low back pain: systematic review | The BMJ Don't perform imaging for	

		patients with non-specific acute low back pain and no indicators of a serious cause for low back pain. - Choosing wisely	

P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral	• Acute onset localised back pain and suspected osteoporotic fracture with:
	  ○ known osteoporosis, or
	  ○ risk factors for osteoporosis including prolonged current or recent, use of corticosteroids
	• Back or neck pain and red flags for malignant bone disease:
	  ○ Patient has a history of cancer, in particular those that commonly metastasize to bone (e.g. breast, prostate, lung)
	  ○ unexplained weight loss (more than 5% of body weight within the last 3 to 6 months)
	  ○ waking at night with pain
	  ○ pain aggravated rather than relieved by lying down
	  ○ persistent pain unrelated to mechanical activity
	• Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for urgent x-ray		

P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Scoliosis with significant functional impairment, where the patient meets the criteria for secondary care referral and x-ray is a pre-requisite for referral • Suspected ankylosing spondylitis where the patient meets the criteria for secondary care referral and x-ray is a pre-requisite for referral – arrange an x-ray of the lumbar spine and sacroiliac joints • Secondary care clinician or Primary Care Radiology Liaison, or radiologist advises referral for non-urgent x-ray	Finucane MBD review paper 2017 (4).pdf (mmu.ac.uk)	
Alternative management or HealthPathway recommended.	• History of recent trauma - request imaging via ACC funding • Progressive neurological deficit - seek Orthopaedic Advice • Osteomyelitis – discuss with relevant specialist		

Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.	• Acute (within the first six weeks) uncomplicated spine pain without red flags – See local Back Pain in Adults HealthPathway • Suspected spinal osteoarthritis or chronic spine pain without red flags (e.g. systemic illness, suspicion of malignancy, risk of infection, inflammatory disease, or osteoporosis)		

Paediatrics

CT Head-Paediatric

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Acute Within 24 hours	• Paediatrician or Paediatric Radiologist advises referral for acute CT Head		GP & UC Doctors / NPs
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Paediatrician or Paediatric Radiologist advises referral for urgent CT Head		
P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Paediatrician or Paediatric Radiologist advises referral for non-urgent CT Head		

US Abdomen – Paediatric

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Refer for acute assessment without initial imaging	• Acute abdominal pain or pyloric stenosis including possible appendicitis – request acute paediatric assessment		GP & UC Doctors / NPs
Acute: Within 48 hours	• Mass or suspected mass on examination – seek paediatric or secondary care advice and if a community ultrasound is recommended prior to hospital review, arrange as an acute same or next day scan • Suspected organomegaly on examination - seek paediatric or secondary care advice and if a community ultrasound is recommended prior to hospital review, arrange as an acute same or next day scan • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for same or next day ultrasound		
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Recurrent RUQ pain and suspected gallbladder pathology • Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for urgent ultrasound scan		
P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Non-acute abdominal pain (three or more bouts of pain severe enough to affect activities (usually school attendance) over a period of not less than three months) and common causes excluded (e.g. constipation) • Secondary care clinician or Primary Care Radiology Liaison or Radiologist advises referral for non-urgent ultrasound scan	Non-acute abdominal pain in childhood (starship.org.nz)	
Alternative management or HealthPathway recommended. **HealthPathway**	• Jaundice - seek paediatric advice • Umbilical or inguinal hernia – imaging not routinely required and typically only if there is diagnostic uncertainty - See local Hernia in Children HealthPathway		

Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.	• Single episode of non-specific (generalised or periumbilical) abdominal pain		

US Hip- Paediatric

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
	Guidance: Developmental Dysplasia of the Hip ***Clinical examination*** *is the recommended first line of DDH screening in New Zealand and should be routinely undertaken perinatally and repeated at six weeks.* *An ultrasound scan of the hips prior to 6 months of age is the accepted initial imaging investigation for those babies with abnormal clinical findings.* *After the child is 4–6 months old, the ossification of the femoral epiphysis begins to obscure sonographic landmarks, and a pelvic x-ray becomes more reliable for the detection or confirmation of DDH. This is the standard tool to diagnose DDH after 5-6 months age and if there are abnormal concerning features on hip exam in an infant aged between 4 and 6 months, urgent x-ray is warranted.* *From a reassurance and efficiency standpoint, early imaging investigation (i.e. ultrasound from age 4 weeks to 5-6 months) is the preferred approach for babies with at least one risk factor for DDH but a normal clinical examination. However, restricted local ultrasound resource availability may necessitate these babies being routinely referred for x-ray from aged 5-6 months instead.* *Deferring the US until aged older than 4-6 weeks for children with risk factors but normal examination has been recommended as recent studies suggest improved ultrasound accuracy at this age compared with newborns).* *Soft signs for DDH including asymmetric thigh buttock creases, clicky hips (common) were previously thought to be strong indicators of abnormality, however more recent studies show 95% of infants with these signs have normal hips.*		GP & UC Doctors / NPs
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• A dislocated or dislocatable hip on Ortolani or Barlow test with a distinct hip 'clunk' reduction in a child younger than 3 months. Manage as per local DDH HealthPathway or, if no local pathway, seek secondary care specialist advice regarding whether an urgent ultrasound and/or outpatient appointment are required. • Abnormal clinical examination, including limited hip abduction (especially if asymmetrical) or leg length discrepancy and child younger than 5 months:	Developmental dysplasia of the hip - Investigations | BMJ Best Practice The management of developmental dysplasia of the	

	○ One (or more) of the risk factors below for DDH and child aged between 4 weeks and 5 months, not previously scanned, and local DDH HealthPathway recommends referral for ultrasound ○ Breech presentation in the 3rd trimester ○ Strong family history of DDH, especially if in a parent or sibling ○ Intrauterine "packaging" problems, e.g. oligohydramnios, bicornuate uterus, birth weight greater than 4kg, club foot, metatarsus adductus, torticollis, dislocated knee • Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for urgent ultrasound	hip in children aged under three months: a consensus study from the British Society for Children's Orthopaedic Surgery - PMC (nih.gov) Orthopaedics: Developmental dysplasia of the hip – DDH (rch.org.au)	
P3 Urgent: Non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for non-urgent ultrasound		
S1 non-deferrable time sensitive imaging or intervention that must be completed within 1 week of a specified target date.	• Borderline dysplasia on initial hip ultrasound and radiologist recommends follow up ultrasound scan		
Alternative management or HealthPathway recommended.	• Child younger than 4 months with one or more soft signs for DDH (clicky hips, asymmetric hip creases) which ○ persist on re-examining after one week AND ○ either there are ongoing clinical concerns of underlying DDH or significant parental anxiety - request an x-ray pelvis and hip from age 4 months • Child older than 4 months at the time of presentation or review, and who has an abnormal exam or other risk factors warranting imaging to confirm normal hip enlocation. Either: ○ See Paediatric Pelvis/ Hip X-ray HealthPathway - note that ultrasound becomes technically more limited beyond this age due to femoral head ossification and x-ray is the preferred exam, and/or ○ Consider discussing with a secondary care specialist to confirm the most appropriate referral pathway and imaging exam especially if less than 5 months old at presentation		

US Neck/Thyroid - Paediatric

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for urgent neck ultrasound after discussion and according to the local Neck Lumps in Children HealthPathway.	Cervical Lymphadenitis (starship.org.nz)	GP & UC Doctors / NPs
P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral	• Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for non-urgent neck ultrasound after discussion and according to the local Neck Lumps in Children HealthPathway.	HealthPathways – Auckland region and Canterbury	

US Pelvis - Paediatric

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Refer for acute assessment without initial imaging	• Child who is acutely unwell from a suspected gynaecological cause (e.g. possible acute ovarian cyst accident or torsion)		GP & UC Doctors / NPs
Acute: Within 48 hours	• Mass, or suspected mass on examination – seek paediatric or other secondary care advice and if community ultrasound is recommended prior to hospital review, arrange a same or next day scan • Secondary care specialist or Primary Care Radiology Liaison advises referral for same or next day ultrasound		
P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral	• Primary amenorrhoea (absence of menarche by age 14y) if no breast development and the presence of a vagina or uterus cannot be confirmed by physical examination • Secondary care specialist or Primary Care Radiology Liaison advises referral for non-urgent ultrasound	HealthPathways	
Alternative management or HealthPathway recommended. **HealthPathway**	• Dysmenorrhoea - See local Dysmenorrhea HealthPathway		

US Renal - Paediatric

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**

Refer for acute assessment without initial imaging	• UTI in a child
	  ○ younger than 3 months of age
	  ○ younger than 6 months of age who has a known urinary tract anatomical abnormality
	  ○ seriously unwell (e.g. with sepsis)
	• Haematuria associated with hypertension, heavy proteinuria, oedema or impaired renal function
		Haematuria in Children - Community HealthPathways Auckland Region | Te rohe o Tāmaki Makaurau	GP & UC Doctors / NPs

P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	*Guidance:* *Asymptomatic microscopic haematuria (more than 10 x10^6 red cells or 1+ on dipstick) is common in children. A single examination will yield haematuria in approximately 4% of school children and therefore requires re-testing. Only 0.5% children will have persisting haematuria in repeat samples 2 to 3 weeks apart.* *Most cases of microscopic haematuria in well children resolve within 6 months and in the absence of other concerning findings generally do not warrant ultrasound investigation.*	Haematuria (starship.org.nz) Clinical Practice Guidelines: Haematuria (rch.org.au)	
	• Macroscopic haematuria, confirmed on microscopy and no other cause found after initial investigations, or if associated with loin pain • Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for urgent ultrasound		
P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Persistent (on repeat testing after 2 weeks), unexplained, (UTI excluded) microscopic haematuria together with proteinuria (i.e. first morning urine albumin: creatinine ratio (ACR) is greater than 3mg/mmol and persists on repeat testing or a one-off urinary ACR is greater than 70mg/mmol) • Persistent (for one year), isolated microscopic haematuria on urine microscopy, without proteinuria, and with elevated urine calcium excretion OR calcium creatinine ratio	Chronic kidney disease: assessment and management - NCBI Bookshelf (nih.gov)	

	• Proteinuria, confirmed on early morning sample (and repeat testing) with albumin: creatinine ratio (ACR) greater than 3 mg/mmol and no red flags[*1] requiring acute secondary care assessment • Secondary care clinician, Primary Care Radiology Liaison, or radiologist advises referral for non-urgent ultrasound scan		
S2 non-deferrable time sensitive imaging or intervention that must be completed within 2 weeks of a specified target date.	*Guidance:* *Urinary Tract Infection (UTI) definitions:* *Atypical UTI* • *Poor response to treatment at 48 hours* • *Poor urine stream* • *Abdominal or bladder mass* • *Raised creatinine* • *Hypertension* • *Infection with non-E. coli organism* *Recurrent UTI* *Two or more episodes of proven UTI per year (three or more if afebrile/mild symptoms)* *Asymptomatic bacteriuria* *Bacteriuria in the absence of pyuria/active infection does NOT suggest UTI. 1.4 - 1.9% prevalence in childhood. This is most often found in school aged and older girls but may also be found in infants.*	Urinary Tract Infection (starship.org.nz) Renal - national antenatal renal dilation guideline (starship.org.nz)	

	• Follow-up of antenatal urinary tract dilatation according to the national guideline and/or as advised by LMC or secondary care specialist.
	
	• Request a renal ultrasound to be performed six weeks after their presentation if any of the following:
	  ○ First UTI in a child younger than 12 months
	  ○ Recurrent UTI in a child of any age, who has not previously been investigated with a renal ultrasound
	  ○ Atypical UTI in child of any age, who has not been previously investigated with a renal ultrasound.		

Alternative management or HealthPathway recommended.	• Enuresis - See local Enuresis in Children HealthPathway. • Suspected testicular torsion – See local Scrotal Pain and Swelling in Children HealthPathway • Child of any age who has previously been investigated with a renal ultrasound more than 12 months earlier - and who re-presents with recurrent or atypical UTI - seek Paediatric advice regarding whether a repeat renal ultrasound is indicated.		
Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.	• Asymptomatic bacteriuria		

*1 Proteinuria “red flags”:

- oedema
- hypertension
- haematuria (microscopic or macroscopic) and patient is unwell
- clinical suspicion of glomerulonephritis

US Scrotum/Testis - Paediatric

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Refer for acute assessment without initial imaging	• Testicular torsion suspected (acute testicular pain, nausea/vomiting, high riding testis, absent cremasteric reflex) • Incarcerated inguinal hernia (acute scrotal and/or groin pain)		GP & UC Doctors / NPs
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Testicular or scrotal lumps which don't trans-illuminate or if the nature of the lump is otherwise uncertain clinically • Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for urgent ultrasound		

Alternative management or HealthPathway recommended.	• Testis if absent / undescended at 3 months – request non-acute secondary care assessment
	• Hydrocele – ultrasound is not routinely required. Request non-acute secondary care assessment if:
	  ○ persistent hydrocele in child older than 18 months
	  ○ atypical features or diagnostic uncertainty at any age
	• Inguinal hernia (males and females) – See local Hernia in Children HealthPathway (note that ultrasound is not routinely required)		

US Soft Tissue Mass - Paediatric

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**

Refer for acute assessment without initial imaging	• Swelling in groin with pain and clinical suspicion of strangulation or incarceration of hernia - irreducible, irritability, pain, tenderness, inflammation
	• Suspected abscess and hospital management considered necessary, especially if red flags: *1
	  ○ child younger than 3 months' old
	  ○ child not expected to tolerate incision
	  ○ systemically unwell
	  ○ swelling or redness around a joint or rapidly progressive
	• Soft tissue mass with suspicious features including hard, irregular, fixed/deep to fascia, rapidly growing and/or more than 5cm in diameter
	
	Guidance: Although inguinal hernia is much more common in males approximately 10% of inguinal hernia occur in females. These occur where the processus vaginalis remains patent within the inguinal canal creating a communication (Canal of Nuck) between the peritoneal cavity, the female inguinal canal, and the labia majora through which small bowel, the ovary +/- fallopian tube +/- uterus may herniate and present as a reducible and typically intermittent soft tissue swelling in the groin or labia.
	
	There is a risk of strangulation and ovarian torsion.
			GP & UC Doctors / NPs

Acute: Within 48 hours	• Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for same or next day ultrasound		
P2 non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for urgent ultrasound		

P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Soft tissue mass without suspicious features (i.e. less than 5cms in diameter, not hard or fixed or deep to fascia) but where the diagnosis is uncertain clinically. Consider discussing with secondary care specialist or Primary Care Radiology Liaison before referring for ultrasound • Swelling in the inguinal region in a male or female child (or in scrotum or labia (non-transilluminating), where a hernia is suspected but ultrasound has been recommended by a secondary care clinician for confirmation • Midline scalp mass • Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for non-urgent ultrasound		
Alternative management or HealthPathway recommended.	• Neck lumps – See local Neck Lumps in Children HealthPathway • Soft tissue masses and other lesions overlying the spine in the midline - seek paediatric advice regarding appropriate management.		

*1 Red flags for abscesses in children:

- systemically unwell or immunocompromised
- aged younger than 3 months
- abscess involving pilonidal, head and neck, or perianal regions, or over a joint
- large red area or rapidly progressive

US Spine - Paediatric

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	*Guidance:* *Sacral dimples, pits, or sinuses present within the inter-gluteal cleft (or within 2.5cms of the anal verge in new-borns) are common benign lesions thought to occur in between 2% and 4% of newborn babies. They do not require imaging or other investigations to exclude underlying spinal anomalies if there are no associated concomitant lesions higher up the spine and there is no evidence of orthopaedic or neurologic abnormality of the lower limbs.* *Adequate ultrasound imaging is possible only until approximately 6 weeks of age. Older infants have ossification of posterior spinous processes that prevents good penetration of the ultrasound beam.* *Over 6 weeks of age discussion with secondary care is recommended as to appropriate alternate investigation.*	Starship - Back and scalp lesions in the newborn	GP & UC Doctors / NPs

	• Child younger than 6 weeks with a sacral dimple or pit where any one of the below features applies:
	  ○ the base of the dimple cannot be visualised
	  ○ the dimple is more than 5mm in diameter
	  ○ the dimple is more than 2.5cm above the anal margin
	  ○ there is an associated cutaneous marking, hairy patch, skin tag, or fatty lump
	  ○ there is a duplicated gluteal cleft
	  ○ there is more than one dimple
	
	• Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for urgent ultrasound		

Alternative management or HealthPathway recommended	• Child older than 6 weeks with simple sacral dimples and pits outside the gluteal cleft – seek paediatric advice as ultrasound is not technically possible and if imaging is indicated, an alternative modality will be required • Soft tissue masses and other lesions overlying the spine in the midline - seek paediatric advice regarding appropriate management.		

Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. **Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.**	• Simple isolated sacral dimples or pits within the gluteal cleft, within 2.5 cm of the anal margin		

X-ray Abdomen - Paediatric

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**

Refer for acute assessment without initial imaging	• History of foreign body ingestion and any of:
	  ○ Suspected oesophageal obstruction (e.g. drooling or reluctance to swallow)
	  ○ Known or suspected disc / button battery ingestion
	  ○ Multiple magnets ingested
	  ○ Large object (more than 5cm long and / or 2cms wide)
	• Acute abdomen
		HealthPathways-Auckland region	GP & UC Doctors / NPs

Acute: Within 48 hours	*Guidance:* • *The majority of ingested foreign bodies (FBs) are low risk objects and can be managed without imaging or intervention.* • *X-rays, when required, should include neck, chest, and abdomen and with lateral as well as frontal views of the neck and chest.*	Foreign body ingestion (starship.org.nz) Clinical Practice Guidelines: Foreign body ingestion (rch.org.au)	
	• History of suspected ingestion of a foreign body but type of object is unclear, the child is asymptomatic, there are no red flags requiring hospital admission, and an acute x-ray advised by secondary care specialist or Primary Care Radiology Liaison • Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for same or next day x-ray		
P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Suspected constipation which is refractory to initial management recommended in the local Constipation in Children HealthPathway -request abdominal x-ray to assess rectal faecal loading • Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for non-urgent x-ray		
Alternative management or HealthPathway recommended. HealthPathway	• Abdominal pain other than suspected constipation – See local Abdominal Pain in Children HealthPathway		

Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. **Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.**	• Suspected injury as a result of a foreign body ingestion – request imaging via ACC funding		

[*1] Foreign body "red flags" (ref: Foreign Bodies Ingested by Children - Community HealthPathways Auckland Region | Te rohe o Tāmaki Makaurau)

- Button battery ingestion e.g., from hearing aid or camera
- Objects longer than 5 cm, wider than 2.5 cm, or sharp objects as these may all become trapped in the pylorus
- Multiple magnets, or magnet with metal
- Lead-based objects

X-ray Chest-Paediatric

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Refer for acute assessment without initial imaging	Refer child for acute assessment without requesting imaging if any of: ○ Respiratory distress- tachycardia, tachypnoea, stridor ○ Breathing difficulties and SpO2 92% or lower ○ Acute severe asthma ○ Suspected inhaled foreign body	X-ray Chest (Children) - Community HealthPathways Waitaha | Canterbury	GP & UC Doctors / NPs
Acute: Within 24 hours	• Chest x-ray is rarely required in suspected community acquired pneumonia (CAP). Consider if: ○ diagnostic uncertainty or atypical presentation ○ not making expected clinical progress and complications are suspected ○ recurrent pneumonia symptoms (i.e. suggestive of underlying respiratory disease) • Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for same or next day x-ray	Pneumonia (starship.org.nz)	
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Persistent moist or loose cough persisting for more than 4 weeks and subsequent trial of two weeks of antibiotics • Recurrent clinically diagnosed pneumonia (e.g. 3 separate infections within 6 months) • Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for urgent x-ray	Cough (starship.org.nz) Foreign body ingestion (starship.org.nz) Chest X-ray in acute wheeze (starship.org.nz)	
P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Asthma - To help assess for alternative diagnoses or co-morbidities if there is an unclear diagnosis, and considering referral for secondary care review, for example: ○ unexpected clinical findings such as crackles, clubbing, or cyanosis ○ persistent non-variable breathlessness ○ monophonic wheeze or stridor ○ systemic features such as weight loss, myalgia, fever ○ poor response to asthma treatment and excessive inhaler use after addressing inhaler technique, adherence, and smoking / vaping cessation		

	• Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for non-urgent x-ray.		
S2 non-deferrable time sensitive imaging or intervention that must be completed within 2 weeks of a specified target date.	• Follow up chest x-ray after complicated or atypical pneumonia, 6 weeks after the initial x-ray or as recommended by a secondary care specialist or radiologist		
Alternative management or HealthPathway recommended.	• Asthma is a clinical diagnosis and CXR is not indicated as a baseline examination unless atypical features.– See local Non-Acute Asthma in Children HealthPathway or the Acute Asthma in Children HealthPathway • Bronchiolitis - typically a clinical diagnosis and Chest x-ray is only indicated if complications are suspected (pleural effusion) or there is diagnostic uncertainty – See local Bronchiolitis HealthPathway • Suspected inhaled foreign body – a chest x-ray may not identify the foreign body and bronchoscopy is routinely required - See local Foreign Bodies Inhaled by Children HealthPathway.	Chest X-ray in acute wheeze (starship.org.nz)	
Community-referred radiology not routinely funded by Health New Zealand in these clinical scenarios. **Imaging may still be appropriate, and the patient may wish to consider privately funding imaging.**	• Follow up chest x-ray of uncomplicated pneumonia or other uncomplicated chest infection • Incidental finding of a murmur – See local Heart Murmurs in Children and Adolescents HealthPathway	Choosing Wisely - Radiographs in children with respiratory symptoms - Don't Forget the Bubbles (dontforgetthebubbles.com)	

X-ray Shoulder and Upper Limb (Humerus, Elbow, Forearm, Wrist/Hand) – Paediatric

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Refer for acute assessment without initial imaging	• Suspected septic arthritis [*1]		GP & UC Doctors / NPs
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Undiagnosed persistent (one week or more) bone or joint pain with pain at rest or night-waking with pain • Unexplained, new bony swelling or joint deformity • Secondary care clinician, Primary Care Radiology Liaison or Radiologist advises referral for urgent X-ray		

P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Persistent unexplained joint or bone pain for more than four weeks
	• Xray elbow - pain and joint swelling, where inflammatory arthritis is suspected and a community elbow x-ray has been recommended by secondary care specialist, Primary Care Radiology Liaison or Radiologist
	• X-ray wrist/hand:
	  • Concern re short stature, tall stature, early or delayed puberty and hand / wrist x-rays are recommended by secondary care specialist to assess bone age
	  • Pain and joint swelling, where inflammatory arthritis is suspected and bilateral hand and wrist x-rays (+/- bilateral feet x-rays) recommended by secondary care specialist, Primary Care Radiology Liaison or radiologist
	• Secondary care clinician, Primary Care Radiology Liaison or Radiologist advises referral for non-urgent x-ray		

Alternative Management or HealthPathway recommended	• Osteomyelitis – discuss with relevant specialist		

[*1] Red flags for septic arthritis or osteomyelitis in a child (ref: Bone and Joint Infections in Children - Community HealthPathways Waitaha | Canterbury)

- single, painful, or swollen limb

- night waking with pain
- unable to move a limb normally
- unwell with a fever, but no obvious cause
- skin infection that is slow to resolve especially if over a joint

X-ray Lower Limb (Femur, Knee, Tibia/Fibula, Foot, Ankle) – Paediatric

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
Refer for acute assessment without initial imaging	• Suspected septic arthritis [*1]		GP & UC Doctors / NPs
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Undiagnosed persistent (for more than one week) foot pain, with pain at rest, or waking at night with pain • Unexplained, new bony swelling or joint deformity • Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for urgent x-ray		
P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for non-urgent X-ray X-ray knee for: • Suspected osteochondritis dissecans with joint pain, typically exacerbated by activity, +/- locking or giving way, +/- joint swelling, +/- reduced range of motion - request AP, lateral, and tunnel view x-rays • Knee pain which persists for more than two weeks and is exacerbated by activity, including if suspected apophysitis • Clinically and biochemically suspected metabolic bone disease affecting knees e.g. rickets, scurvy • Bow leg with concern for pathologic cause in a child older than 2.5 years of age, with unilateral deformity +/- any of: ○ symptomatic with pain+/or limp ○ history of infection or trauma to affected limb ○ severe bowing and Blount's disease suspected ○ poor growth – under 3rd height percentile for age X-ray foot/ankle for: • Pes planus (flat feet) – weight-bearing x-rays are indicated if the flat foot: • is rigid at any age • becomes persistently or progressively more painful • shows significant bony deformity	Flat Feet in Children - Community HealthPathways Waitaha | Canterbury	

	• Undiagnosed persistent (for two weeks or more) foot pain without red flags, including pain exacerbated by activity • Pain and joint swelling where an inflammatory arthritis is suspected and bilateral feet x-rays (+/- bilateral hands and wrists) has been recommended by a secondary care specialist, Primary Care Radiology Liaison or radiologist.		

Alternative management or HealthPathway recommended.	• Osteomyelitis – discuss with relevant specialist
	• X-ray knee:
	  • Knock knees (genu valgum)
	  • Bakers' cyst
	  • Osgood-Schlatter disease – history and physical examination are usually sufficient to make the diagnosis
	  • Bursitis
	  • Sinding Larsen Johansson disease (patellar tendonitis or Jumper's knee)
	  • Patellofemoral pain syndrome, including chondromalacia patella		

*1 Red flags for septic arthritis or osteomyelitis in a child (ref: Bone and Joint Infections in Children - Community HealthPathways Waitaha | Canterbury)

- a limp
- single, painful, or swollen limb
- night waking with pain
- refusal to weight-bear or unable to weight-bear
- inability to move a limb normally (in infants who are not yet mobile)
- unwell with a fever, but no obvious cause
- skin infection that is slow to resolve especially if over a joint

X-ray Pelvis/Hip - Paediatric

Paediatric	Referral Criteria and Prioritisation Timeframes		
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
	Guidance: Developmental Dysplasia of the Hip ***Clinical examination*** *is the recommended first line of DDH screening in New Zealand and should be routinely undertaken perinatally and repeated at six weeks.* *An ultrasound scan of the hips prior to 6 months of age is the accepted initial imaging investigation for those babies with abnormal clinical findings.* *After the child is 4–6 months old, the ossification of the femoral epiphysis begins to obscure sonographic landmarks, and a pelvic x-ray becomes more reliable for the detection or confirmation of DDH. This is the standard tool to diagnose DDH after 5-6 months age and if there are abnormal concerning features on hip exam in an infant aged between 4 and 6 months, urgent x-ray is warranted.* *From a reassurance and efficiency standpoint, early imaging investigation (i.e. ultrasound from age 4 weeks to 5-6 months) is the preferred approach for babies with at least one risk factor for DDH but a normal clinical examination. However, restricted local ultrasound resource availability may necessitate these babies being routinely referred for x-ray from aged 5-6 months instead.* *Deferring the US until aged older than 4-6 weeks for children with risk factors but normal examination has been recommended as recent studies suggest improved ultrasound accuracy at this age compared with newborns).* *Soft signs for DDH including asymmetric thigh buttock creases, clicky hips (common) were previously thought to be strong indicators of abnormality, however more recent studies show 95% of infants with these signs have normal hips.*	Child with a Limp - Community HealthPathways Auckland Region | Te rohe o Tāmaki Makaurau Developmental Dysplasia of the Hip (DDH) - Community HealthPathways Auckland Region | Te rohe o Tāmaki Makaurau Limp in Childhood - Community HealthPathways Waitaha | Canterbury	GP & UC Doctors / NPs
Refer for acute assessment without initial imaging	• Suspected septic arthritis or osteomyelitis • Suspected Slipped Upper Femoral Epiphysis (SUFE)		
Acute: Within 24 hours	• Child presenting with non-acute symptoms where a diagnosis of SUFE is suspected - arrange hip X-ray with AP pelvis film and frog lateral view. Be aware that very early slips may be subtle and missed on X ray and have a low threshold for seeking orthopaedic advice.		

P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Suspected Perthes Disease - pain in hip, groin and/or knee especially on weight bearing, limp, reluctance to weight bear, most typically in child 4 to 8 years old - request AP hip and frog leg lateral
	• Suspected transient synovitis or irritable hip - suspect in a child younger than 5 years of age presenting with a limp and who is recovering from a viral illness - consider x-ray to exclude more serious conditions
	• Suspected DDH on examination*3 in child over 4 months of age with
	  ○ Limited hip abduction
	  ○ Leg length discrepancy
	  ○ Abnormal, waddling gait
	• Risk factors*1 for DDH, not previously imaged with ultrasound or x-ray and child is 4 months' or older
	• Unexplained, new bony swelling or joint deformity
	• Secondary care clinician or Primary Care Radiology Liaison or radiologist advises referral for urgent x-ray
		Limp - assessment of paediatric limp in the Emergency Department (starship.org.nz)	

P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Soft signs*2 for DDH which persist on re-examination after 1-2 weeks, not previously imaged and child 4 months' or older • Suspected apophysitis with pain exacerbated by activity for more than one week but diagnosis unclear • If the patient presents with knee pain, but there is no evidence of knee pathology on examination – request a hip-x-ray with AP Pelvis and frog lateral views to exclude hip pathology.		

Alternative management or HealthPathway recommended.	• Suspected DDH in infant less than 4 months old with abnormal exam findings including
	  ○ Positive Ortolani and Barlow tests with clunk on relocation
	  ○ Leg length discrepancy
	  ○ Limited hip abduction
	- See local Ultrasound Hip HealthPathway or local DDH HealthPathway.
	• Osteomyelitis – discuss with relevant specialist		

*1 Risk factors for DDH warranting screening imaging (Orthopaedics: Developmental dysplasia of the hip – DDH (rch.org.au))

- Breech presentation at any time in the 3rd trimester
- Strong family history of DDH, especially if in a parent or sibling
- Intrauterine "packaging" problems, e.g. oligohydramnios, bicornuate uterus, birth weight ≥ 4000 g, club foot, metatarsus adductus, torticollis, dislocated knee

*2 Soft signs for DDH

- Asymmetric thigh buttock creases
- Clicky hips
- Slight differences in limb lengths that may be difficult to detect on repeat examination

*3 Examination findings suggestive of DDH, in child older than 3 months

- Limited abduction
- Limited mobility
- Abnormal gait
- Leg length discrepancy

X-ray Spine- Paediatric

Referral Criteria and Prioritisation Timeframes			
Timeframe	**Clinical Presentation**	**Source**	**Referrers**
P2 Urgent: Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	• Unexplained, new bony swelling or joint deformity		GP & UC Doctors / NPs

P3 non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	• Spinal deformity and community x-ray recommended prior to referral or review in secondary care, especially where scoliosis and any of the following:
	  ○ Severe pain
	  ○ Clinically rapidly progressing curves
	  ○ Left thoracic curves, e.g. curve bulging out towards the left
	  ○ Significant curves or significant rib humps
	• Secondary care clinician, Primary Care Radiology Liaison or radiologist advises referral for non-urgent spine X-ray		

Appendix 1. National Prioritisation Guideline for Imaging and Reporting (NRN 2024)

Acute Radiology Patient Priority	Definition	Turnaround Time Targets Referral to Review or Report Distribution
< 30 minutes	Immediate life-threatening presentations. Image immediately.	30 minutes*
< 1 hr	All ED patients and inpatients that are clinically unwell. Ideally services should have capacity to image other ED and acute assessment patients in < 1 hr to support risk management, decision making and patient flow.	1 hr*
< 4 hrs	Most inpatient imaging. Imaging in < 4 hrs supports decision making and patient flow.	4 hrs*
< 24 hrs	Lower acuity inpatients and outpatients (including acute demand type primary care patients) that can wait up to 24 hrs.	24 hrs
< 2 days	Non-deferrable typically outpatient imaging that must be completed within 2 days.	2 days

It is expected that the majority of ED imaging will be non-deferrable time sensitive imaging. In hospital settings, if ED and inpatient demand exceeds capacity, clinical triage across all patients waiting may trump any flow-based ED targets or priority pathways.

*Out of hours, emergency and inpatient imaging may receive a preliminary report or be reviewed by on-call medical staff, with final reports being completed in normal working hours.

Radiology Patient Priority	Definition	Turnaround Time Targets Referral to Report Distribution	
		Overall	Report within
P1	Non-deferrable time sensitive imaging or intervention that must be completed within 1 week of receiving referral.	< 1 week	24 hrs
P2	Non-deferrable imaging or intervention that must be completed within 2 weeks of receiving referral.	< 2 weeks	24 hrs
P3	Non-deferrable imaging or intervention that must be completed within 6 weeks of receiving referral.	< 6 weeks	48 hrs
P4	Deferrable. If capacity is constrained could wait up to 6-12 weeks from receiving referral.	< 6 weeks	48 hrs
P5	Deferrable low priority. If capacity is constrained could wait >12 weeks.	< 6 weeks	48 hrs
PET-CT	All PET-CT referrals except those with a specified future date.	< 7 working days	
NA	Overdue reporting waiting > 24 or 48 hours outsourced to other services/providers.	NA	Up to 5 days by mutual agreement

Specified Date Patient Priority	Definition	Turnaround Time Targets Referral to Report Distribution	
		Overall	Report within
S1	Non-deferrable time sensitive imaging or intervention that must be completed within 1 week of a specified target date.	Within 1 week of specified target date	24 hrs
S2	Non-deferrable time sensitive imaging or intervention that must be completed within 2 weeks of a specified target date.	Within 1 week of specified target date	24 hrs
S3	Non-deferrable time sensitive imaging or intervention that must be completed within 6 weeks of a specified target date.	Within 1 week of specified target date	48 hrs
S4	Deferrable time sensitive imaging or intervention. If capacity is constrained could wait up to 6-12 weeks after a specified target date.	Within 1 week of specified target date	48 hrs
S5	Deferrable low priority imaging or intervention. If capacity is constrained could wait >12 weeks after a specified target date.	Within 1 week of specified target date	48 hrs

Specified date imaging (S) refers to imaging that must be completed on a specific date or within a specified date range for clinical reasons based on a known diagnosis. Examples are protocols or guidelines that specify when imaging must occur to assess for treatment response or growth or progression of an incidental finding such as a pulmonary nodule.

The S categories should not be used to drive meeting patient flow related targets such as FSA or MDM or clinic dates. Access to imaging and interventional services for any referrals not meeting the definition of specified date imaging should be based on the national by clinical indication recommended triage categories. These describe maximum reasonable waiting times based on the clinical indication/suspected diagnosis and associated risk.