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National Criteria for Access to Community Radiology

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Contents

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Background

Radiological investigation is a basic component of primary health care. Improving primary health care practitioners' ability to diagnose and manage conditions and to make more appropriate referrals to secondary health care should lead to better patient outcomes.

The Ministry of Health originally developed the *National Radiology Referral Guidelines* in 2001. As a result of feedback from the sector, the Ministry has replaced the *National Radiology Referral Guidelines* with this set of criteria. The move from guidelines to criteria is carefully considered. Guidelines by definition identify the best practice management of a given condition, but do not take into consideration resource limitations and (in the case of radiology) the need to manage demand for diagnostic imaging or the access of primary care providers to specific types of imaging.

These criteria were developed by a panel of clinicians comprising primary care, radiology, nursing and occupational health representatives.

The process to develop these criteria included:

- a stocktake of current access criteria across all DHBs
- a review of DHBs' existing access criteria
- expert input and advice from specialists, particularly across primary care and radiology services
- a review of international literature on best practice.

These criteria will be updated, to consider new technology and changing clinical practice.

Primary and secondary care integration

These criteria support the Ministry of Health's strategic intent to provide better integrated care between primary and secondary care. An integrated health system supports greater clinical integration and the use of clinical networks.

Clinical pathways assist clinicians to choose the most appropriate diagnostic examinations in the correct sequence, and are preferable to standalone access criteria. District health boards need to develop and implement appropriate locally agreed clinical pathways for common conditions presenting to primary and secondary care. The Ministry expects DHBs to develop pathways according to broad clinical consensus and through primary and secondary care partnerships.

The Ministry has developed these criteria in the absence of a full set of clinical pathways, which include imaging steps. Locally agreed clinical pathways supersede these criteria.

Purpose of these criteria

The *National Criteria for Access to Community Radiology* has been developed to:

- assist primary care practitioners to manage radiology patients effectively in the community by ensuring they get appropriate access to diagnostics
- provide district health boards (DHBs) with a minimum benchmark of service provision.

The criteria provide:

- a nationally recommended minimum level of radiology access to help primary care practitioners to manage patients in the community
- a practical guide on radiology referral for primary care practitioners (including nurse practitioners)
- a basis for DHBs to develop local access criteria to prioritise resources to those with the greatest clinical need and most potential to benefit.

These criteria are not mandatory. Some DHBs have already developed, or are in the process of developing, their own criteria for access to radiology. In this case, DHBs can use the criteria to check and update their own criteria. Other DHBs may find these criteria useful to help develop their own criteria.

Implementing these criteria

Successful implementation of these criteria will be dependent on:

- local engagement between primary and secondary care clinicians
- integration with clinical pathways and processes for triage and/or retrospective feedback on referrals.

As a general guide, service providers should implement these criteria by:

1. embedding the criteria into clinical workflow; for example, through an electronic referral system. This saves the time required to link to paper guidelines or other electronic versions, and improves the timeliness of information sharing
2. smart functionality, to alert referrers to provide necessary prerequisite information
3. reserving clinical prior authorisation for complex, or very high cost, or unusual cases, or when a clinician has a history of not following the agreed recommended clinical guidelines.

If a condition is on the list of exclusions but a primary care practitioner considers the patient would benefit from imaging, the practitioner should consult with a specialist. To this end, radiology departments should ensure that specialists are readily contactable by phone and their contact details, along with criteria for accessing their services, easy to find.

Scope of these criteria

The scope of community radiology is set out in the National Community Radiology Service Specifications. For the purposes of these criteria, however, providers should note the following facts.

1. Imaging covered by ACC or other funding streams, including under the Section 88 Primary Maternity Services Notice, is outside the scope of these criteria.
2. Imaging that is part of screening or surveillance programmes is outside the scope of these criteria.
3. The age band covered by the paediatric criteria has not been specified, acknowledging local paediatric service age group variation.

Prioritisation and wait times

The Ministry suggests prioritising referrals based on clinical need:

- **acute** – same day
- **urgent** – within 1–2 weeks
- **routine** – within six weeks.

In many DHBs, acute imaging requests are provided through a primary options or acute care scheme; the Ministry expects that local pathways will define the process for these.

The Ministry encourages referrers to communicate expected wait times to their patients and communicate with radiology services where they feel a referral is other than routine.

Provision of all routine imaging within six weeks is a 'working towards' benchmark in DHB radiology departments.

The Ministry expects that reporting of all procedures will be completed within 24 to 48 hours, and strongly recommends electronic distribution of reports. Radiology departments should telephone significant findings to referrers on the day of imaging. All referrers should include telephone numbers on the request form, to ensure ready contact.

Managing demand

Managing the demand for diagnostic imaging is essential to:

- ensure services are safe, efficient, effective and sustainable
- manage radiology volumes and budgets, and reduce the wait time for patients in the community.

Some factors that can impact on demand include:

- lack of access to previous imaging reports or other clinical information
- pressure from patients
- factors affecting the clinician, such as inexperience.

Managing demand focuses on ensuring referrals are appropriate. The term 'appropriate' here refers to a way of working based on agreed guidance: typically access criteria or clinical pathways.

Best practice for referrals

Referrals may be inappropriate because a health practitioner refers a patient:

- for a particular investigation when an alternative would have been preferable as it had greater benefit and less risk
- for an investigation at the wrong time
- for an investigation when none was needed (either there was no relevant question to be answered, there was no change in diagnosis or no management change would result).

It is also inappropriate not to refer a patient for an investigation when they need one.

Indications for diagnostic imaging may not always be clear-cut; primary health practitioners should discuss with radiologists or refer for clinical review relevant specialists where appropriate.

A useful investigation is one in which the result – positive or negative – may alter management and improve the outcome for the patient. A significant number of radiological investigations do not fulfil these aims, and may add unnecessarily to patient irradiation.

Health practitioners should take particular care in considering whether to order tests that involve ionising radiation, especially in younger people.

A chest X-ray delivers approximately 0.04 mSv – the equivalent of eight days of natural background radiation, while a CT of the abdomen and pelvis is approximately 14 mSv, or eight years of natural background radiation. The Ministry expects all radiology providers to ensure their equipment and imaging protocols are kept up to date, to deliver radiation doses that are as low as practicably achievable.

The Ministry has developed the following principles to assist DHBs to establish effective demand management processes.

Local governance

District health boards should establish formal local governance processes so that accountability for managing the demand for community radiology referrals is clear and so that services can maintain capacity and capability within budgets to the highest possible quality. The governance process should allow for feedback on performance against the established guidelines and 'fair' usage expectations.

Managing budgets

All decision-makers (funders, providers and referrers) should regularly assess budgets and volumes of referrals. In managing community radiology budgets, DHBs should make use of alliancing arrangements, and make sure professions formally share information on clinical management and budget decisions.

Prior authorisation

Prior authorisation from a DHB radiologist or relevant clinical specialist should only be required for complex, or very high cost, or unusual cases, or when a referrer has a history of not following the agreed recommended clinical pathways.

District health boards should make nominated consultants available to provide primary care practitioners with advice on case management.

Clinical practice and ongoing education

District health boards should undertake regular clinical audit, to facilitate a shared understanding of 'reasonable practice' between all decision-makers. They should offer clinical education on the outcome of audits.

Legislative requirements of DHBs

The Ministry of Health requires DHBs' annual plans to ensure primary care services have direct access to a complete suite of X-rays and ultrasound services (that is, abdomen, pelvis, renal, small parts, deep venous thrombosis and musculoskeletal).

The Ministry also expects DHBs to provide mammography and fluoroscopy services; however, these criteria do not apply to those services as service models and resource availability for them vary across the country. Service provision of local nuclear medicine, double energy X-ray absorption and magnetic resonance imaging currently varies. This document does not specify minimum access criteria for these modalities; however, subsequent versions may do so.

These criteria fulfil the requirements of the National Community Radiology Service Specifications, which require DHBs to define access criteria and expected waiting times for diagnostic imaging. (These service specifications are due to be updated, but this requirement is expected to remain.)

Criteria for access to radiology

The following pages outline community radiology access criteria. The criteria indicate when imaging is indicated and when it is not indicated, and provide guidance for referrers, under the following headings:

- X-ray
- ultrasound
- CT scans
- paediatric imaging.

X-ray

Abdomen

Standard indications for X-ray referral:

- diagnosis of constipation where patient history is unobtainable (eg, patient with autism or special needs)
- follow-up of radio-opaque (ie, evident on CT scout view) renal tract stones with a kidney, ureter, bladder (KUB) X-ray
- suspected renal tract stone according to local renal colic pathway criteria, where CT KUB is unavailable.

Referral for community X-ray not typically indicated:

- acute abdomen: discuss with acute surgical services or emergency services
- vague central abdominal pain
- suspected colorectal neoplasm (refer to colorectal cancer guidelines)
- suspected constipation (other than in specific patient groups as above).

Ankle

Standard indications for X-ray referral:

- undiagnosed pain present more than four weeks where the X-ray is expected to change management
- ankle pain with red flags
- known osteoarthritis with symptoms meeting local criteria for surgical consideration (not required if previously X-rayed within six months)
- pain in previous arthroplasty
- swelling, deformity or mass near the joint.

Red flags include:

- persistent deep pain unrelated to activity
- night pain in the absence of an obvious cause.

Referral for community X-ray not typically indicated:

- suspected septic joint: refer for acute review at emergency department or orthopaedic department
- acute gout.

Chest

Standard indications for X-ray referral:

- X-ray result will change patient management.

Referral for community X-ray not typically indicated:

- screening for lung cancer in asymptomatic patient
- pneumonia doesn't require routine chest X-ray (CXR) follow-up unless there are risk factors or red flags, including age > 50 years, significant smoking history, suspicious radiologic findings on initial CXR or incomplete clinical resolution at six weeks (this is a guideline only – there may be local pathways that apply) [1]
- routine assessment of hypertension
- routine monitoring of known pulmonary sarcoidosis
- routine X-ray for asbestos exposure surveillance
- follow-up of nodules detected on chest X-ray or CT other than where recommended by reporting or reviewing specialist (consider referral for respiratory specialist review)
- initial investigation of heart murmur, unless signs of complications such as heart failure
- routine follow-up of asymptomatic patients on amiodarone.

Elbow

Standard indications for X-ray referral:

- undiagnosed pain present more than four weeks where the X-ray is expected to change management
- elbow pain with red flags
- known osteoarthritis with symptoms meeting local criteria for surgical consideration (not required if previously X-rayed within six months)
- pain in previous arthroplasty
- swelling, deformity or mass near the joint.

Red flags include:

- persistent deep pain unrelated to activity
- night pain in the absence of an obvious cause.

Referral for community X-ray not typically indicated:

- suspected septic joint: refer for acute review
- acute gout.

Hand/wrist

Standard indications for X-ray referral:

- undiagnosed hand/wrist pain present more than four weeks where the X-ray is expected to change management
- hand/wrist pain with red flags
- known osteoarthritis with symptoms meeting local criteria for surgical consideration (not required if previously X-rayed within six months)
- pain in previous arthroplasty
- swelling, deformity or mass near the joint.

Red flags include:

- persistent deep pain unrelated to activity
- night pain in the absence of an obvious cause.

Referral for community X-ray not typically indicated:

- suspected septic joint: refer for acute review
- acute gout.

> **Guidance**
>
> Dedicated wrist views do not typically provide additional information to that obtained via single postero-anterior (PA) hand view. Where inflammatory arthritis is suspected, consider requesting an antero-posterior (AP) feet X-ray as well.

Hip

Standard indications for imaging referral:

- undiagnosed hip pain present for more than four weeks where the X-ray is expected to change management
- hip pain with red flags
- known osteoarthritis where symptoms meet local criteria for surgical consideration (not required if previously X-rayed within six months)
- pain in previous arthroplasty
- swelling, deformity or mass near the joint.

Red flags include:

- persistent deep pain unrelated to activity
- night pain in the absence of an obvious cause.

Referral for community X-ray not typically indicated:

- suspected septic arthritis: refer for acute review at emergency department or orthopaedic department
- mild symptoms and normal examination findings
- follow-up of known or suspected osteoarthritis unless red flags develop or patient meets local criteria for surgery.

Knee

Standard indications for X-ray referral:

- undiagnosed knee pain present more than four weeks where the X-ray is expected to change management
- knee pain with red flags
- known osteoarthritis with symptoms meeting local criteria for surgical consideration (not required if previously X-rayed within six months)
- pain in previous arthroplasty
- swelling, deformity or mass near the joint.

Red flags include:

- persistent deep pain unrelated to activity
- night pain in the absence of an obvious cause.

Referral for community X-ray not typically indicated:

- suspected septic arthritis: refer for acute review at emergency department or orthopaedic department
- mild symptoms and normal examination finding
- follow-up of suspected or known osteoarthritis unless red flags develop or patient now meets local clinical criteria for surgery
- suspected meniscal and ligament injury.

Guidance

Routinely request standing knee X-rays. Such views demonstrate the magnitude of any cartilage loss, which reflects the severity of any osteoarthritis.

Shoulder

Standard indications for X-ray referral:

- undiagnosed shoulder pain present more than four weeks where the X-ray is expected to change management
- shoulder pain with red flags
- known osteoarthritis with symptoms meeting local criteria for surgical consideration (not required if previously X-rayed within six months)
- pain in previous arthroplasty
- swelling, deformity or mass near the joint.

Red flags include:

- persistent deep pain unrelated to activity
- night pain in the absence of an obvious cause.

Referral for community X-ray not typically indicated:

- recent onset pain in the absence of red flags
- frozen shoulder (unless the condition does not follow its expected natural history)
- prerequisite for a trial of steroid injection (when a reasonable clinical diagnosis has been made and red flags are excluded)
- suspected septic arthritis: refer for acute review at emergency department or orthopaedic department.

Sinuses

> **Guidance**
>
> Plain films are no longer recommended.

Skull

Standard indications for X-ray referral:

- presence of a palpable vault abnormality that feels bony.

Referral for community X-ray imaging not typically indicated:

- trauma: discuss with emergency department consultant. CT head may be appropriate
- headache
- epilepsy
- cognitive impairment
- middle or inner ear problems
- suspected intracranial space occupying lesion.

> **Guidance**
>
> Refer suspected pituitary problems to a local relevant specialist.

Spine

Standard indications for X-ray referral:

- spine pain more than eight weeks
- spine pain with red flags
- spine pain and osteoporosis or prolonged use of corticosteroids
- focal neurological deficit (where recommended by local relevant specialist)
- significant spinal deformity.

Red flags include:[2]

- persistent deep pain unrelated to activity
- night pain in the absence of an obvious cause
- a history of cancer.

Referral for community X-ray not typically indicated:

- acute uncomplicated spine pain without red flags (benign self-limiting condition).

Guidance

Where there is high clinical suspicion of infection or cancer, consult a local relevant specialist.

Ultrasound

Abdomen

Standard indications for ultrasound referral:

- abdominal mass or other palpable abdominal abnormality
- painless jaundice without obvious cause
- suspected gallstones: persistent/recurrent right upper quadrant pain
- suspected pancreatic disease (limited resolution in obesity)
- clinically suspected or radiologically suspected aortic aneurysm (AAA)
- follow-up of AAA as per local guideline
- abnormal liver function tests (LFTs); both gamma glutamyl transferase (GGT) and alanine aminotransferase (ALT) elevated to greater than 1.5 times the upper limit of normal for more than three months with no other clinical cause
- abnormal LFTs suggestive of biliary tract obstruction or malignancy (persistently raised alkaline phosphatase (ALP)/GGT± bilirubin).[3]

Referral for community ultrasound not typically indicated:

- infective hepatitis
- acute abdomen or suspected bowel obstruction (discuss with local relevant service)
- dyspepsia
- suspected colorectal neoplasm (refer to colorectal cancer guidelines)
- clinically evident hernia in adults
- screening for AAA.

Guidance

Discuss suspected pancreatic disease with a relevant local specialist. A CT scan may be more appropriate.

Breast

Standard indications for ultrasound referral in the absence of local breast pathway:

- women under 40 years of age with clinically benign or uncertain lump, or localised change in texture
- men with unexplained or suspicious unilateral breast enlargement
- axillary lymph node enlargement or suspected lymph node enlargement in the absence of obvious infectious cause.

Referral for community ultrasound not typically indicated:

- breast pain alone
- bilateral male breast enlargement.

Guidance

- Referral to a local breast service for advice/assessment and multidisciplinary work-up, is preferable, and where such a service is available locally (this supersedes these recommendations).
- Mammography (± ultrasound) is the appropriate investigation modality for women over 40 years. If there is no breast clinic service available, refer these women directly for mammography and ultrasound if required.

Carotid Doppler

Standard indications for imaging referral:

- history of transient ischaemic attack or stroke with minor deficit where presentation meets local pathway criteria
- where no local pathway is in place and a relevant specialist has recommended a carotid Doppler ultrasound.

Referral for community/outpatient imaging not typically indicated:

- asymptomatic carotid bruits.

Groin

Standard indications for ultrasound referral:

- non-reducible groin mass present for longer than three weeks. (If mass is suspicious of cancer, discuss with local specialist.)

Referral for community ultrasound not typically indicated:

- lymph nodes < 1.5 cm diameter and present less than three weeks
- groin pain with no palpable mass.

Guidance

Most hernias can be diagnosed by clinical examination; ultrasound is rarely needed.

Hip

Referral for ultrasound not typically indicated:

- suspected trochanteric bursitis. The underlying pathology in greater trochanteric pain syndrome is most commonly gluteus tendinopathy, and ultrasound is not routinely required. Referral for hip X-ray is recommended to identify bone or joint pathology.[4]

Neck

Standard indications for ultrasound referral:

- salivary gland mass persisting for more than three weeks
- suspected lymph node or undifferentiated neck mass – where swelling has persisted more than three weeks, is > 1.5 cm size and there is no obvious infectious or other medical cause.[5]

Guidance

- If a neck mass is suspicious for malignancy, discuss with a relevant local specialist.
- If a patient has a prior history of a salivary gland tumour or cutaneous squamous cell carcinoma SCC of head or face or has onset of facial nerve symptoms, discuss with relevant surgical specialist; referral to a clinic may be more appropriate.

Pelvis

Standard indications for ultrasound referral:

- intrauterine contraceptive device (IUCD) strings not visible on examination
- post-menopausal bleeding after one year of amenorrhoea
- pelvic mass on examination. Request a Ca125 and an urgent scan if there is a high index of suspicion for ovarian malignancy
- suspected ovarian cyst (unilateral pelvic pain for more than four weeks and/or pelvic mass or unilateral tenderness)
- pelvic pain more than six weeks unrelated to menstrual cycle, with pelvic inflammatory disease excluded. Pre-referral expectation is that cervix has been visualised and swabs and smear taken
- abnormal pre-menopausal bleeding > 45 years old. Pre-referral expectation is that if IUCD was present it has been removed for 3+ months.[6]
- abnormal bleeding < 45 years old and one or more of the following risk factors for endometrial hyperplasia:[6]
  - weight >90 kg
  - history of unopposed oestrogen or tamoxifen use
  - nulliparity
  - chronic anovulation ± infertility.

Referral for ultrasound not typically indicated:

- routine follow-up of known fibroids[7]
- follow-up of simple ovarian cyst < 5 cm diameter in asymptomatic premenopausal/low-risk woman[8]
- primary dysmenorrhoea
- suspected endometriosis in the absence of a palpable mass
- polycystic ovary syndrome where the required two out of three diagnostic criteria are fulfilled by clinical and biochemical features (eg, oligomenorrhoea and clinical or biochemical hyperandrogenism).[9]

Guidance

- Refer women with acute non-pregnant pelvic pain in the absence of a palpable mass to the appropriate specialty service.
- For prolonged and/or heavy vagina bleeding after termination of pregnancy (TOP) or post-partum, refer under Section 88 Primary Maternity notice up to two weeks post miscarriage/TOP and six weeks post-partum).

Renal

Standard indications for ultrasound referral:

- estimated glomerular filtration rate eGFR is consistently reduced for age after repeat testing with the patient well hydrated:[10]
  - < 70 years : eGFR is reduced to < 45 mls/min
  - > 70 years: eGFR is reduced to < 30 mls/min
- painless haematuria:
  - persistent microscopic haematuria on two or more uncontaminated (epithelial cell count < 15 x 10^6/L) mid-stream urinalyses (not dipstix), or
  - macroscopic haematuria
- polycystic kidneys: ultrasound screening when > 20 years age and a positive family history with one or more first-degree relatives affected
- recurrent urinary tract infections (UTI) in females with one or more of these risk factors for an identifiable underlying cause:[11]
  - repeated (more than two episodes) pyelonephritis (fever, chills, vomiting, costo-vertebral angle tenderness)
  - persistence of infection on urinalysis after completion of a prolonged three-week course of appropriate antibiotics (ie, laboratory confirmed sensitivity)
  - gross haematuria or persistent microscopic haematuria (> 15 x 10^6) on two separate specimens) after resolution of infection
  - recurrence of infection after three months of completed antibiotic prophylaxis
  - urea-splitting organisms (eg, proteus, klebsiella, pseudomonas)
  - history of abdomino-pelvic malignancy or immunocompromise
  - history of urinary tract surgery or calculi
  - obstructive symptoms with straining and weak stream

- recurrent or persistent UTI in males
- suspected renal colic in pregnancy. For all other patients, consider referral for CT KUB
- suspected urinary retention with palpable/suspected enlarged bladder.

Referral for community ultrasound not typically indicated:

- recurrent uncomplicated UTIs in adult females (underlying abnormalities are uncommon)
- investigation of hypertension
- elevated prostate-specific antigen
- lower urinary tract symptoms
- investigation of isolated proteinuria (discuss with local relevant specialist)
- serial ultrasounds for polycystic kidneys, unless there are clinical symptoms.

Scrotum

Standard indications for imaging referral:

- scrotal masses with concerning features (eg, testicular mass, painless, non-transilluminating, rapidly growing (urgent urology referral recommended))
- scrotal masses where either the clinical diagnosis is in doubt or it is unclear if the swelling is testicular or extra-testicular
- new hydrocoele in adults (may be secondary to testicular cancer).

Referral for community imaging not typically indicated:

- non-solid (transilluminating) scrotal masses
- hydrocoele in children
- long-standing hydrocoele in adults
- acute inflammatory conditions – only refer for ultrasound if symptoms and/or swelling fail to resolve with antibiotics
- chronic testicular pain in the absence of abnormality on examination.

Guidance

Refer urgently to surgical service for surgery if the following conditions are suspected:

- testicular torsion
- testicular cancer
- strangulated inguinal hernia.

Scrotal masses can often be diagnosed clinically. If unsure, seek a second opinion from a general practitioner colleague or specialist.

Shoulder

Standard indications for ultrasound referral:

- pain and restricted movement that persists after eight weeks of conservative treatment including physiotherapy and/or cortisone injection
- when a full thickness tear is suspected and immediate surgical repair is being considered.

> **Guidance**
>
> - Radiology is not a prerequisite for a trial of steroid injection when a reasonable clinical diagnosis has been made and red flags have been excluded.

Soft tissue

Standard indications for community imaging referral:

- soft tissue mass with red flags; however, specialist assessment is preferred, so only request imaging if there is likely to be a delay before the patient is seen
- suspicion of a foreign body where not covered by ACC.

Red flags include a soft tissue mass with any of the following characteristics):[12]

- growing
- > 5 cm in size
- deep to deep fascia (limited mobility, less mobile with muscle flexion)
- painful (most malignant lumps are painless; pain suggests nerve or bone involvement)
- recurring after a previous excision.

> **Guidance**
>
> - Apply caution in the use of ultrasound, as its ability to characterise solid mass lesions is limited and incorrect diagnosis can lead to significant treatment delays.
> - Consider requesting a plain X-ray as well.
> - If a sarcoma is suspected, reserve biopsy for an orthopaedic or sarcoma specialist.

Thyroid

Standard indications for ultrasound referral:

- palpable nodules
- euthyroid goitre.

Referral for community ultrasound not typically indicated:

- thryotoxicosis (with or without goitre)[13]
- goitre with hypothyroidism.

Guidance

Red flags for thyroid malignancy, consider discussing with a local relevant specialist service where a patient presents with:

- < 20 years or > 60 years
- history of head or neck malignancy
- family history of thyroid cancer
- rapid growth of a nodule
- hard, ill-defined or fixed nodule
- hoarseness, dysphagia or dysphonia
- cervical lymphadenopathy.

Vascular

Standard indications for ultrasound referral:

- pulsatile mass for investigation
- suspected DVT (refer to local pathway if available)
- proximal superficial thrombophlebitis in thigh.

Referral for community ultrasound not typically indicated:

- suspected venous and arterial insufficiency – unless directed by local pathway.

Guidance

For patients with progressive uni- or bilateral lower limb oedema, consider referral for abdomino-pelvic ultrasound, to exclude proximal lymphatic obstruction.

CT scans

CT head

Standard indications for CT referral:

- undiagnosed cognitive impairment with one or more high-risk feature:[14]
  - age < 60 years
  - rapid (ie, one or two months) unexplained decline in cognition or function
  - recent and significant head trauma
  - unexplained neurological symptoms (eg, new onset of severe headache or seizures)
  - history of cancer (especially in sites and types that metastasize to the brain)
  - use of anticoagulants or history of bleeding disorder
  - history of urinary incontinence and gait disorder early in the course of dementia (as may be found in normal pressure hydrocephalus)
  - any new localizing sign (eg, hemiparesis or a Babinski reflex)
  - unusual or atypical cognitive symptoms or presentation (eg, progressive aphasia)
  - gait disturbance

- headaches where at least one of the following apply:
  - new onset > 50 years
  - change in pattern of headaches with increase in frequency or severity
  - aggravated by exertion or Valsalva
  - associated with nausea and vomiting
  - background systemic illness with cerebral complications or involvement; especially malignancy (breast, lung, melanoma).

Guidance

While CT may be appropriate as part of the work-up, initially discuss with local relevant specialist for patients who have:

- focal neurological signs
- acute cognitive decline or change in personality.

CT abdomen

CT KUB

Standard indications for CT KUB referral:

- non-pregnant patients with renal colic according to local pathway.

CT colonography[15,16, 17, 18]

Standard indications for CT colonography (CTC) referral in patients where colorectal cancer is suspected:

- symptomatic patients over 80 years
- patients with co-morbidities when colonoscopy presents a higher risk (eg, patients on warfarin therapy, respiratory risk from sedation)
- patients presenting with abdominal mass
- following failed or incomplete colonoscopy
- patients with symptoms which are average to low risk for malignancy (patients who previously would have been referred for barium enema).

Referral for CTC not typically indicated (ie, refer for colonoscopy):

- diarrhoea as the predominant presenting symptom
- known polyp syndromes (including familial) where biopsy/removal is likely to be required
- suspected inflammatory bowel disease where mucosal visualisation and biopsy are required for diagnosis
- young patients (< 40 years).

Guidance

Referral is not typically indicated for either CTC or colonoscopy where there is:

- abdominal pain alone
- constipation as a single symptom
- irritable bowel syndrome (consider specialist referral first)

- uncomplicated CT-proven diverticulitis without suspicious radiological features.

The local DHB is likely to triage referrals for investigation of bowel symptoms to either CTC or colonoscopy, depending on clinical presentation and resource availability.

CTC requires bowel preparation similar to colonoscopy, including fasting. The procedure involves rectal air insufflation and changing position on the scanner table.

Where patient fitness level would preclude active treatment if a cancer is diagnosed, a minimal preparation CT colon (MPCT) should be considered. Discussion with local radiologist recommended.

The 'miss' rate of lesions > 1 cm with both well-performed colonoscopy and CTC is approximately 6 percent.

CTC is not intended for the detection of diminutive polyps <5mm.

CT sinus

Guidance

Sinus CT is not generally indicated without failed medical management. The main role of sinus CT is for pre-surgical planning, rather than determining the need for surgery.

Paediatric imaging

X-ray – chest

Standard indications for X-ray referral:

- lower respiratory tract disease (including asthma/bronchiolitis/pneumonia) unresponsive to treatment
- inhalation or suspected inhalation of foreign body.

Referral for X-ray not typically indicated:

- incidental finding of a murmur
- uncomplicated (afebrile) presentation of asthma/bronchiolitis.

X-ray – lower limb

Referral for X-ray not typically indicated:

- Osgood-Schlatters, Sever's and other apophysitides

X-ray – pelvis/hips

Standard indications for X-ray referral:

- pain
- limp
- risk factors/soft signs or suspected developmental dysplasia of the hip (DDH).

Guidance

- Capital femoral epiphyses ossify on average at 5–6 months of age; DDH can usually be reliably excluded from this age onwards on X-ray.[19]
- Slipped upper femoral epiphysis requires urgent orthopaedic referral.

Ultrasound – hips

Standard indication for ultrasound referral:

- unstable or dislocated hip in child less than 3–4 months age; also refer to orthopaedic specialist.

Referral for ultrasound not typically indicated:

- soft signs (asymmetric buttock creases, leg length discrepancy, clicky hips) or risk factors (breech presentation, family history): refer for plain X-ray at 5–6 months.

Ultrasound – neonatal spine

Standard indications for ultrasound referral:

- sacral dimple or pit: non-simple (ie, with at least one of the following criteria):[18]
  - outside the natal cleft (> 2.5 cm from anal verge in neonate)
  - associated with cutaneous stigmata of spinal dysraphism – hairy tuft, haemangioma
  - > 5 mm diameter
  - deep (bottom of dimple not visible).

Referral for ultrasound not typically indicated:

- simple isolated dimples within the gluteal cleft
- child more than eight weeks age: ultrasound spine not technically feasible with ossification of the posterior elements. Suggest discussion or review by local specialist.

Ultrasound – renal

Standard indications for ultrasound referral:

- child < 12 months with first-time documented UTI
- child of any age with recurrent UTI (no previous imaging)
- child of any age with complicated UTI (eg, pyelonephritis, atypical UTI)
- follow-up of antenatal hydronephrosis or other renal abnormality as recommended by reporting radiologist.

Referral for ultrasound not typically indicated:

- asymptomatic bacteriuria.

Abbreviations

AAA	Abdominal aortic aneurysm
ACC	Accident Compensation Corporation
CT	Computed tomography
CTC	CT colonography
CXR	Chest X-ray
DEXA	Double energy X-ray absorption
DDH	Developmental dysplasia of the hip
DHB	District health board
DVT	Deep venous thrombosis
GGT	Gamma glutamyl transferase
eGFR	Estimated Glomerular filtration rate
IUCD	Intrauterine contraceptive device
KUB	Kidney, ureter, bladder
LFT	Liver function tests
MRI	Magnetic resonance imaging
TOP	Termination of pregnancy
UTI	Urinary tract infection

Endnotes

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