Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
Head and Neck				
K01. Diagnosis	CT	Indicated [B]	☢☢	Imaging is used mainly to diagnose patients with clinically suspected occult disease or patients presenting with locoregional or distant metastasis.
	MRI	Indicated [B]	0	Imaging is used mainly to diagnose patients with clinically suspected occult disease or patients presenting with locoregional or distant metastasis.
K02. Staging	CT	Indicated [B]	☢☢	Imaging is used to assess extent of the disease at the primary site, nodal involvement and distant metastasis. US is used to assess nodal metastasis. CT and MR are used to assess TMN staging. MR is more sensitive compared to CT to assess cartilage and bone involvement. Dynamic contrast enhanced CT and MR, CT and MR perfusion, DWI and MRS are emerging imaging techniques that could increase the diagnostic accuracy in lesion detection, characterization, and prediction of treatment response. Combining one or more imaging modalities could improve imaging test performance. US, CT and occasionally MR could be used as guiding tool for biopsy to confirm nodal or distant metastasis.
	MRI	Indicated [B]	0	MRI should be used to stage oropharyngeal and oral tumours.
	PET/CT	Specialized investigation [B]	☢☢☢☢	PET/CT is recommended for the staging of nasopharyngeal cancer. PET/CT is recommended in patients with metastatic squamous cell carcinoma presenting in neck nodes when the results of standard radiologic investigation do not reveal the primary site.
	Lympho-scintigraphy	Indicated [B]	☢☢	Recommendation for localization of sentinel lymph nodes in early stage oral cancers.
K03. Follow up	CT, MR PET/CT	Indicated [C]	Depends on modality used for surveillance	CT, MR are used in additional to clinical surveillance to assess for tumour response and recurrence in symptomatic and asymptomatic patients. PET/CT may be useful in the restaging of patients with recurrent squamous cell carcinoma of the Head and Neck when major salvage treatment is being considered.

Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
Parotid				
K04. Diagnosis	US	Indicated [B]	0	US imaging performance could be operator dependent. US is helpful to assess superficial parotid lesions and as a guiding tool for indeterminate mass biopsy. Role of US elastography is being investigated in differentiating benign from malignant parotid tumours.
	CT	Specialized investigation [B]	☢☢	CT is most helpful to assess gland calcification and suspected inflammatory lesions. Dental filling could compromise the utility of CT in assessing parotid tumours. CT and MR are often not adequate to confidently characterize and exclude malignancy in parotid lesions. Although CT could be used to assess lesion extent and metastasis if performing MR is not feasible.
	MRI	Specialized investigation [B]	0	MR is more sensitive compared to CT and US to assess extent and perineural tumour spread. Utilization of MR perfusion and DWI/ADC in addition to conventional MR imaging tools could be helpful for better characterization of parotid tumours.
K05. Staging	CT	Indicated [B]	☢☢	CT could be used to assess parotid tumour staging if performing MR is not safe and feasible. CT is preferred test to assess for chest and abdominal metastasis.
	MRI	Indicated [B]	0	MR is the preferred imaging test to assess tumour TNM stage. MR is more sensitive to assess perineural, skull base and intracranial spread of salivary gland tumours. Imaging modalities are more accurate when combined than when used alone.
K06. Follow up	CT, MR PET/CT	Indicated [C]	Depends on modality used for surveillance	MR is the preferred imaging test to assess for residual or recurrent disease. PET/CT may be used to assess for residual disease in select cases, as a problem solving tool.
Larynx				
K07. Diagnosis	Clinical Endoscopy	Indicated [B]	0	Preepiglottic space is a blind spot in clinical assessment.
	CT	Indicated only in special circumstances [B]	☢☢	CT is the preferred modality due to laryngeal motion. CT of whole neck during in quite respiration and CT of larynx with breath-hold is helpful to assess nodal disease and local extent respectively. Oblique reformat could be helpful to minimize artifacts from dental fillings.
	MRI	Indicated only in special circumstances [B]	0	MR is more sensitive to assess for cartilage invasion and offer higher soft tissue contrast but it is more prone to motion artifacts.

Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
K08. Staging	CT	Indicated [B]	☢☢	Both CT and MR could be use to assess primary disease extent and nodal metastasis. CT is preferred to assess distant particularly non osseous metastasis.
	MRI	Indicated [B]	0	Both CT and MR could be use to assess primary disease extent and nodal metastasis. CT is preferred to assess distant particularly non osseous metastasis.
	US	Specialized investigation [B]	0	US could be used to asses for extent of nodal disease and follow up in experienced hands.
K09. Follow up	CT, MR	Specialized investigation [B]	Depends on modality used for surveillance	CT, MR could be used to assess for residual and recurrent disease. Role of dynamic CT perfusion to differentiate post XRT changes from tumour is being investigated.
Thyroid				
K10. Diagnosis	NM	Indicated [B]	☢☢	^{123}I and ^{99m}Tc-pertechnetate scan is used to identify potentially malignant cold nodules. ^{131}I-MIBG, ^{123}I-MIBG (preferable) and ^{99m}Tc(V)-DMSA can be used to evaluate medullary carcinomas.
	US	Indicated [B]	0	US imaging performance could be operator dependent. US is helpful to assess thyroid lesions and as a guiding tool to biopsy indeterminate lesions. Role of US elastography is being investigated in differentiating benign from malignant thyroid tumours.
K11. Staging	CT	Indicated [B]	☢☢	CT could be used to assess extent of primary tumour, nodal and distant metastasis.
	MRI	Indicated [B]	0	MR is preferred imaging method compared to CT since does not require iodinated contrast injection that could interfere with iodine uptake and organification.
	US	Indicated [B]	0	Diagnostic performance could be operator dependent. US is helpful to assess tumour extent and nodal disease.
	NM	Indicated [B]	☢☢☢☢	I-131 whole body scanning is indicated 1 week after administration of a therapy dose. I-131 whole body scanning is indicated in post therapy patients with rising thyroglobulin levels.
	PET/CT	Specialized investigation [B]	☢☢☢☢	For which standard imaging studies, including I-131 scan and/or neck ultrasound, are negative or equivocal, and recurrent or persistent disease is suspected on the basis of an elevated and/or rising thyroglobulin level(s).

Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
K12. Follow up	NM, US, MR, PET/CT	Specialized investigation [B]	Depends on modality used for surveillance	MR is very good modality to detect recurrence. I-123 or I-131 whole body scanning is useful in the followup of well-differentiated thyroid carcinoma and I-123 MIBG, I-131-MIBG, or 99mTc(V)-DMSA can be useful for follow-up of medullary carcinomas. Occasionally Doppler US could be helpful to differentiate scar from tumour tissue.
K13. Diagnosis: Uveal Melanoma	MRI orbits	Recommended [A]	0	Modality of choice for assessment of uveal melanoma.
Staging				
K14. Stage I or IIA/B*	CXR	Recommended [B]	☢	As baseline – incidence of metastasis extremely low.
	US	Recommended [B]	0	More effective than clinical exam at detecting and diagnosing metastatic disease to regional lymph nodes.
	CT	Not indicated [C]	☢☢☢	Incidence of metastasis very low (<3%).
	Lympho-scintigraphy	Indicated [A]	☢☢	For clinical stage II CM and for clinical stage I CM with poor prognostic features.
	PET/CT	Not indicated [C]	☢☢☢☢	Incidence of metastasis very low (<3%).
	MRI brain	Not indicated [C]	0	Incidence of metastasis very low.
K15. Stage IIC or III with macrometastasis sentinel LN or LN dissection	CXR	Recommended [B]	☢	As baseline.
	CT Chest / Abdomen	Recommended [B]	☢☢☢	For determining location and extent of disease.
	CT Pelvis	Recommended [B]	☢☢☢	When primary tumour below waist.
	PET/CT	Recommended [C]	☢☢☢☢	PET/CT may be used for the staging of melanoma patients with localized high-risk tumours with potentially resectable disease.
	MRI brain	Recommended, if symptomatic [A]	0	Not indicated if no neurological symptoms.
K16. Stage IV[1]	MRI brain	Recommended [C]	0	In patients with clinical features suspicious for cerebral metastases or inpatients with stage IV disease or recurrent disease where exclusion of cerebral metastases is required.
	CT Chest / Abdomen	Recommended [B]	☢☢☢	For determining location and extent of disease.
	CT Pelvis	Recommended [B]	☢☢☢	Add to CT chest / abdomen when primary is below waist.

1 Imaging for Stage IV disease does not change outcome but may be useful for palliation.

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Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
K16. Stage IV *(continued)*	PET/CT	Recommended [C]	☢☢☢☢	May be useful in oligometastatic disease when surgical resection if contemplated.
	CXR	Recommended [C]	☢	Some evidence suggests cost effective. q 6 months x 2 years, then annually to total of 10 years.
K17. Follow-Up	Ultrasound	Recommended [B]	0	Locoregional lymph node basin. Indeterminate frequency. q 6-12 months x 2 years, then as needed.
	CT Chest / Abdomen	Recommended, if symptomatic [B]	☢☢☢☢	If symptomatic. If high stage at initial dx (III or IV). Frequency and benefit uncertain.
	PET/CT	Recommended if symptomatic [B]	☢☢☢☢	A recommendation cannot be made for or against the use of PET/CT for routine surveillance due to insufficient evidence.
	Bone scan	Recommended, if symptomatic [B]	☢☢☢	Can be considered if there is bone pain and X-ray is negative.
K18. Diagnosis	CXR	Indicated [A]	☢	When patients have signs and symptoms of lung cancer.
	CT Chest / Abdomen	Indicated [B]	☢☢☢	Should be performed before bronchoscopy or biopsy procedure.
	PET/CT	Indicated [B]	☢☢☢☢	See K21.
K19. Staging NSCLC	CT Chest / Abdomen	Indicated [A]	☢☢☢	Lymph nodes greater than 1 cm in the short axis are considered suspicious. Should be performed before bronchoscopy or biopsy procedure.
	Chest MRI	Specialized Investigation [C]	0	Chest wall invasion or Pancoast tumours.
	PET/CT	Indicated [A]	☢☢☢☢	1. NSCLC for which curative surgical resection is being considered based on negative standard imaging tests; or 2. For clinical stage III NSCLC which is being considered for potentially curative combined modality therapy with radical radiotherapy and chemotherapy.
	Brain MRI	Indicated [B]	0	For patients with neurological symptoms.
	Brain CT	Specialized [B] indication	☢	For patients with neurological symptoms if MRI contraindicated.
	Bone scan	Not indicated if PET performed [C]	☢☢☢	For patients with bone symptoms.

Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
K20. Staging SC	CT Chest incl. upper abdomen	Indicated [B]	☢☢☢	Scans to include entire liver and adrenal glands.
	Brain MRI	Indicated [A]	0	Stage 1 disease patients who are considered for curative surgical resection.
	CT head	Specialized indication [A]	☢☢	If MRI is contraindicated.
	Chest MRI	Not indicated [C]	0	Limited value.
	PET/CT	Indicated [B]	☢☢☢☢	Limited disease small cell lung cancer: for evaluation and staging where combined modality therapy with chemotherapy and radiotherapy is being considered.
	Bone scan	Not indicated if PET performed [C]	☢☢☢	Limited value following PET/CT.
K21. Solitary pulmonary nodule	CT Chest	Indicated [B]	☢☢☢	To differentiate between benign and potentially malignant lesions.
	PET/CT	Indicated [A]	☢☢☢☢	1. Solitary Pulmonary Nodule (SPN) for which a diagnosis could not be established by a needle biopsy due to unsuccessful attempted needle biopsy; 2. The SPN is inaccessible to needle biopsy; or 3. The existence of a contra-indication to the use of needle biopsy.
Upper GI				
Esophagus				
K22. Diagnosis	Barium swallow	Indicated [B]	☢☢	Less sensitive in detecting early disease than endoscopy.
	Endoscopy	Indicated [B]	0	Allows for biopsies.
K23. Staging	CT Chest / Abdomen	Indicated [B]	☢☢☢	Should be performed with intravenous contrast and gastric distension.
	MRI Abdomen	Indicated only in specific circumstances [C]	0	Should be performed when patient cannot undergo CT.
	Trans esophageal US	Indicated [B]	0	Requires expertise. If available, it can be the initial investigation. Often used if CT suggests patient is operable, to plan most appropriate surgery.
	PET-CT	Indicated [B]	☢☢☢☢	PET/CT is appropriate for all patients potentially eligible for curative treatment, for the identification of distant metastases.

Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
Stomach				
K24. Diagnosis	Endoscopy	Indicated [C]	0	It is the investigation of choice for patients with clinical symptoms of weight loss and anaemia.
	Barium meal	Indicated [B]	☢☢	Double contrast can aid in diagnosing gastric cancer but there has been a slow but steady decline in the volume of barium studies in the past 25 years.
K25. Staging	CT Chest / Abdomen / Pelvis	Indicated [B]	☢☢☢	Contrast enhanced CT scan is currently the best staging investigation.
	Endoscopic ultrasound (EUS)	Specialized Investigation [B]	0	EUS is helpful in determining the proximal and distal extent of the tumour as well as local staging.
	PET-CT	Specialized Investigation [B]	☢☢☢☢	May upstage patients with gastric cancer, although most studies show equivalent results as CT. May be negative in patients with mucinous tumours or "indolent" GIST. PET/CT should be reserved as a problem solving tool in select cases.
Liver – Primary Lesion HCC				
K26. Diagnosis and staging	US	Indicated [B]	0	Sensitivity for detecting small nodules is low. Screening for HCC should use ultrasound alone. Patient at risk should undergo screening at 6 month intervals. If ultrasound detects lesions less than 1 cm continued follow up with ultrasound at 3 months intervals should be performed. If follow up ultrasound shows interval increase in size then the lesion should be evaluated with Triphasic CT scan or Contrast enhanced MRI based on availability.
	CT triphasic	Indicated [C]	☢☢☢	Triphasic CT increases number of nodules detected. Sensitivity to detect HCC in cirrhotic livers is low. Arterial Hyper vascularity" and" Venous or delayed phase washout should establish the diagnosis of HCC in a cirrhotic liver. If CT scan cannot fully characterize the lesion then MRI should be performed.
	MRI enhanced	Specialized Investigation [B]	0	Better sensitivity and specificity than CT particularly in nodular cirrhotic livers. Arterial hyper vascularity" and" Venous or delayed phase washout should establish the diagnosis.

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Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
K26. Diagnosis and staging *(continued)*	Biopsy	Indicated [C]	Depends on modality used to guide the biopsy	Diagnosis of HCC should be based on imaging characteristics of HCC on MR or CT. Biopsy can be performed if accurate diagnosis of HCC cannot be achieved by these two modalities.
	NM	Specialized Investigation [B]	☢☢☢☢	Sulfur colloid and Gallium scan for Hepatoma assessment superior to FDG PET-CT.
K27. Staging	PET/CT	Specialized Investigation [C]	☢☢☢☢	May detect distant metastases in aggressive HCC, but FDG-PET/CT is not appropriate for diagnosis or staging of hepatomas due to high false negative rate.
Liver – Secondary Lesion				
K28. Diagnosis	US	Indicated [B]	0	US for larger > 2 cm leasions and for guiding percutaneous biopsy.
	CT	Indicated [B]	☢☢☢	Triple phase protocol. Can identify other distal disease.
	MRI	Indicated [B]	0	MRI if US negative but high clinical suspicion. Appropriate IV contrast required.
	PET CT	Indicated [C]	☢☢☢☢	May be useful if other tests are equivocal, assuming primary tumour is FDG-avid.
Pancreas[2]				
K29. Suspected Diagnosis	US	Indicated [B]	0	Clinical presentation suggesting cancer of the pancreas should lead without delay to ultrasound of the liver, bile duct, and pancreas Ultrasound should be performed initially if patient presents with symptoms only without abnormal lab or physical exam findings.
	CT	Indicated [B]	☢☢☢	Abdominal scan with intravenous contrast utilizing Pancreatic biphasic protocol (Arterial and Portal venous phases) can be performed when symptoms are accompanied by abnormal lab or physical examination, or if an abnormality is noted on ultrasound. Pelvic CT scan can be performed in addition to Abdominal CT scan for more accurate staging if initial ultrasound is abnormal.

2 This guideline refers only to adenocarcinoma of the pancreas, which accounts for over 90% of pancreatic malignancies.

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Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
K29. Suspected Diagnosis *(continued)*	MRI/MRCP	Specialized Investigation [B]	0	MRI with contrast can be performed to further clarify clinical questions remaining from CT and ultrasound. If contrast enhanced CT scan is contraindicated (ie severe allergic reaction), MRI with contrast can be performed when symptoms are accompanied by abnormal lab or physical examination, or if an abnormality is noted on ultrasound.
	ERCP/ERCP	Specialized Investigation [C]	☢ – ☢☢☢	MRCP can be performed for clarification of problems. ERCP may also be needed.
	PET/CT	Specialized Investigation [B]	☢☢☢☢	PET is not recommended for primary diagnosis of pancreatic cancer. It may have a role in depicting malignant or invasive changes in mucinous cystic neoplasms and intraductal papillary neoplasms (IPMNs).
	Biopsy	Specialized Investigation [C]	Depends on modality used to guide the biopsy	Attempts for tissue diagnosis should be obtained during endoscopic procedures. If images are highly suggestive; tissue diagnosis is not needed. Tissue diagnosis can be attempted if imaging appearances are not characteristic or overlapping with other entities. It should be obtained in patients been selected for palliative treatment. Biopsy can be performed using CT, ultrasound or endoscopic ultrasound.
K30. Staging/ Restaging	CT	Indicated [B]	☢☢☢	Contrasted enhanced CT scan of the chest and abdomen or any other areas initially suspected of having disease can be performed for staging or restaging.
	MRI/ MRCPMRI	Specialized Investigation [C]	0	It is not routinely performed for staging or restaging , albeit it can be used for clarification of lesions depicted but not characterized by CT scan or if iodinated contrast is contraindicated.
	PET-CT	Specialized Investigation [C]	☢☢☢☢	PET may be useful for staging if a patient is a candidate for potentially curative surgical resection as determined by conventional staging.

Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
Colorectal Cancer				
K31. Diagnosis	Optical Colonoscopy	Indicated [A]	0	Examination of choice.
	CT Colonography	Indicated [A]	☢☢	Indicated when colonoscopy incomplete, contra-indicated or unavailable.
	Double contrast barium enema	Specialized investigation [B]	☢☢ – ☢☢☢	Due to inferior sensitivity cannot be considered an alternative to colonoscopy. May be considered only when colonoscopy or CTC is not available.
	CT Abdomen and Pelvis with IV iodinated contrast	Specialized investigation [C]	☢☢☢	Inferior to CT Colonography may be considered second line for advanced neoplasia in elderly or infirmed patient unable to tolerate bowel prep and insufflations.
	MRI Abdomen with IV gadolinium contrast	Specialized investigation [C]	0	Small studies suggest high sensitivity and specificity. But experience is limited in North America. Should only be performed by those with experience.
	FDG PET CT	Not indicated [C]	☢☢☢☢	There is no evidence for use of PET for routine diagnosis of CRC. Although PET may detect CRC incidentally, it is not indicated due to high false positive and false negative rate and availability of more appropriate tests such as colonoscopy or CT colonography.
K32. Staging	CT Abdomen and Pelvis with IV iodinated contrast	Indicated [B]	☢☢☢	First line to detect metastatic disease and stage colorectal malignancy.
	CXR	Indicated [B]	☢	To detect lung metastases. (Choice of CXR or CT Thorax for metastatic work up and surveillance is up to institution preference. Consistency at the institution is important.)
	CT Thorax	Indicated [B]	☢☢	To detect lung metastases. (Choice of CXR or CT Thorax for metastatic work up and surveillance is up to institution preference. Consistency at the institution is important.)
	US Abdomen	Indicated [B]	0	Useful to detect hepatic metastases but less sensitive then CT, MRI, and PET-CT.

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Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
K32. Staging *(continued)*	MRI Abdomen with IV gadolinium contrast	Indicated [B]	0	Recommended for characterizing indeterminate liver lesions. Useful adjunct to CT for presurgical staging before hepatic resection.
	FDG PET/CT	Indicated [B]	☢☢☢☢	The routine use of PET is not recommended for the diagnosis or staging of clinical Stage I-III colorectal cancers. PET is recommended in select cases, as a problem solving tool, if conventional imaging is equivocal for the presence of metastatic disease.
K33. Staging: Specific considerations for rectal tumours	MRI Pelvis	Indicated [B]	0	The only modality to accurately evaluate the circumferential resection margin. Recommended to stage patients and determine need for preoperative chemoradiation and surgical planning.
	TRUS	Indicated [B]	0	Indicated when expertise is available (useful for T staging, but inferior to MR for stenotic and some high tumours, cannot assess the circumferential resection margin).
K34. Follow-up	CT Abdomen and Pelvis with IV iodinated contrast	Indicated [B]	☢☢☢	First line for follow-up if rising CEA or symptoms. Follow up of asymptomatic patients in remission annually for 3 or more years may improve outcomes in patient who are candidates for further therapy.
	MRI Abdomen or Pelvis with IV gadolinium contrast	Specialized investigation [B]	0	Specialty exam for follow up when CT is indeterminate for metastases or recurrence in the abdomen or pelvis.
	FDG PET CT	Indicated [B]	☢☢☢☢	PET is recommended to determine the site of recurrence in the setting of rising carcinoembryonic antigen (CEA) when a conventional workup fails to unequivocally identify metastatic disease. PET is currently not recommended for routine surveillance in patients with colorectal cancer treated with curative surgery at high risk for recurrence.
	US abdomen	Indicated [B]	0	Useful to detect hepatic metastases but less sensitive then CT, MRI, and PET-CT.

Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
Kidney Cancer				
K35. Diagnosis	US of abdomen	Indicated [B]	0	US to identify and characterize cystic versus solid renal lesions.
	CT Abdomen and Pelvis with IV iodinated contrast	Indicated [B]	☢☢☢	Should be reserved for those patients in a tertiary referral centre whose disease is deemed resectable on the basis of CT / MRI.
	MRI Abdomen or pelvis with IV gadolinium contrast	Specialized Investigation [B]	0	MRI if CT and US equivicle or patient allergic to CT IV contrast.
	IVP	Not indicated [B]	☢☢	Of historical value. Replaced by US, CT and MRI.
	PET/CT	Specialized Investigation [C]	☢☢☢☢	The role of FDG PET in diagnosis and staging of RCC appears limited by low sensitivity.
K36. Staging	CXR	Indicated [C]	☢	To identify pulmonary metastasis.
	CT Abdomen and Pelvis with IV iodinated contrast	Indicated [B]	☢☢☢	CT and MRI are equivalent at staging T1 disease.
	MRI Abdomen or pelvis with IV gadolinium contrast	Specialized Investigation [B]	0	Better than CT in advanced stages.
	PET-CT	Specialized Investigation [C]	☢☢☢☢	No evidence for routine use in staging and detection of renal carcinoma.
K37. Recurrence	CT Abdomen and Pelvis with IV iodinated contrast	Indicated [B]	☢☢☢	If there are clinical symptoms of recurrence.
	PET-CT	Specialized Investigation [C]	☢☢☢☢	Useful only when primary tumour demonstrates avid FDG uptake. Frequent false negative lesions.

Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
Urinary Bladder				
K38. Diagnosis	Cystoscopy	Indicated [B]	0	To diagnose bladder tumours.
	US	Indicated only in specific circumstances [B]	0	Can miss small tumours.
K39. Staging	CXR	Indicated [C]	☢	To identify pulmonary metastasis.
	MRI pelvis with IV gadolinium contrast	Indicated [B]	0	MRI for locally invasive disease staging.
	CT Abdomen and Pelvis with IV iodinated contrast	Indicated [B]	☢☢☢ – ☢☢☢☢	CT if MRI is contraindicated.
	PET/CT	Specialized Investigation [C]	☢☢☢☢	There is some emerging evidence to support the use of FDG PET/CT in detecting bladder cancer metastases. Until further data from prospective trials are available, this should be reserved for cases where routine imaging is equiovical or negative and that positive findings would affect management.
Testicle				
K40. Diagnosis	US	Indicated [B]	0	US useful if high clinical suspicion and if patient with signs of inflammatory or infection is not responding to treatment.
K41. Staging	CT Chest, Abdomen and Pelvis	Indicated [B]	☢☢☢	Should include thorax, abdomen and pelvis.
	PET/CT	Indicated [B]	☢☢☢☢	For M assessment in pure seminomas and mixed germinal cells tumour without teratoma component. Teratoma can be a source of false negative. Role in N not yet clarified.

Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
K42. Follow-up	CT	Indicated [B]	☢☢☢ – ☢☢☢☢	CT of thorax, abdomen and pelvis. Pelvis can be omitted if no prior pelvic nodal disease.
	PET/CT	Indicated only in specific circumstances [B]	☢☢☢☢	For which recurrent or persistent disease is suspected on the basis of: • elevated tumour marker(s) (beta human chorionic gonadotrophin (HCG) and/or alpha fetoprotein) in the presence of negative or equivocal standard imaging studies; or • the presence of a residual mass after primary treatment for seminoma when curative surgical resection is being considered. PET is not recommended for the assessment of treatment response in patients with nonseminoma. (Comment: Teratoma is problematic: Mature teratoma can be falsely negative on FDG, and a treated teratoma may transform into a granuloma which can be falsely positive.)
Prostate				
K43. Screening	Transrectal ultrasound (TRUS)	Specialized investigation [A]	0	Prostate cancer screening is done with PSA and digital rectal examination (DRE). TRUS is occasionally useful in anxious men and those with strong family history.
K44. Diagnosis	Transrectal ultrasound and biopsy	Indicated [A]	0	TRUS is useful for suspicious lesion detection and biopsy guidance. Color Doppler may help. Biopsy is needed to confirm cancer.
	MRI	Specialized investigation [A]	0	In patients with increasing indications, negative TRUS and repeated negative biopsy, MRI may find suspicious areas needing biopsy. Multiparametric MRI with endorectal coil are important.
	CT	Not indicated [B]	☢☢☢	No role at this time.
	Isotope studies	Not indicated [B]	☢☢☢	No role at this time.
K45. Staging	Transrectal ultrasound	Indicated [B]	0	TRUS may help detect tumour extension through the capsule, into seminal vesicles and into local periprostatic nodes but is less accurate than MRI.
	CT scan	Indicated [B]	☢☢☢	CT can help detect tumour extension extension through the capsule, into seminal vesicles and into local periprostatic nodes, regional and distal nodes and skeleton.

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Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
K45. Staging *(continued)*	MRI	Indicated [B]	0	MRI can help detect tumour extension through the capsule, into seminal vesicles and into local periprostatic nodes, regional and distal nodes and skeleton. Multiparametric MRI with endorectal coil are important.
	Nuclear scan	Special indication [A]	☢☢☢	Isotope bone scan is helpful in detection of skeletal metastases but has value only in men with skeletal symptoms, those with PSA over 20 ng/ml, and those with high grade disease (Gleason ≥ 7) and high volume disease at biopsy.
	Skeletal x-ray	Special indication [B]	☢☢	Can help clarify abnormal isotope scan, but CT and MRI are preferred.
K46. Intervention	Transrectal ultrasound	Indicated [A]	0	TRUS is helpful in guiding biopsy and therapies including insertion of fiducial seeds, brachytherapy, focal therapies, abscess drainage, seminal vesicle sampling.
	MRI	Specialized application [A]	0	MRI can be used to guide biopsy in men where prior biopsies have been negative and also in guidance of focal therapies.
	CT	Not indicated [C]	☢☢☢	No role at this time.
K47. Monitoring after cancer therapy[3]	TRUS	Special indication [B]	0	Useful after radiotherapy to guide biopsy. Not useful to monitor tumour response.
	CT	Special indication [B]	☢☢☢	To evaluate for local extension and local and distant spread. Not useful for intraprostatic recurrence.
	MRI	Specialized application [B]	0	Generally not indicated. Becoming useful in special circumstances to evaluate for intraprostatic, local and distant recurrence. Endorectal coil and special sequences needed to evaluate intraprostatic recurrence.
	Nuclear scan	Special indication [A]	☢☢☢	To evaluate suspected skeletal involvement.
K48. Lower Urinary tract symptoms [LUTS]	Pelvic ultrasound	Special indication [B]	0	To evaluate prostate size and morphology, bladder size, morphology and emptying.
	Abdominal ultrasound	Special indication [B]	0	Useful when pelvic ultrasound shows significant bladder changes suggesting high risk of obstructive uropathy.
	Transrectal ultrasound	Special indication [B]	0	Useful if clinical examination is suspicious for tumour.

3 Monitoring is done primarily with PSA.

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Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
K48. Lower Urinary tract symptoms [LUTS] *(continued)*	CT scan	Special indication [B]	☢☢☢	Useful only with signs of upper tract abnormality such as azotemia, hematuria, infection.
	MRI	Special indication [B]	0	Useful only with signs of upper tract abnormality such as azotemia, hematuria, infection.
	Nuclear scan	Not indicated [B]	☢☢☢	No role at this time.
K49. Male infertility	Pelvic ultrasound	Special indication [C]	0	If pelvic mass suspected.
	Transrectal ultrasound	Special indication [B]	0	For evaluation of seminal ducts in the region of the prostate when indicated by clinical investigation. Rarely may be helpful to aspirate sperm from seminal ducts.
	Scrotal ultrasound	Indicated [B]	0	To evaluate for varicocele and testicular morphology.
	MRI	Special indication [B]	0	In occasional patients, to assess intraabdominal segments of seminal ducts.
	CT	Not indicated [C]	☢☢☢	No role at this time.
K50. Prostatitis: male chronic pelvic pain syndrome	Pelvic ultrasound	Special indication [B]	0	Imaging generally not indicated unless patients refractory to treatment.
	Transrectal ultrasound	Special indication [B]	0	TRUS can be used to evaluate for and aspirate prostate abscesses in patients refractory to treatment.
	CT	Special indication [B]	☢☢☢	Rarely useful in patients refractory to treatment.
	MRI	Not indicated [B]	0	Rarely useful in patients refractory to treatment.
Gynecological Cancers				
Ovary				
K51. Diagnosis	US	Indicated [A]	0	Ovarian masses are frequently detected on sonography. Transbadominal as well as transvaginal views are mandatory. Ultrasound can be limited by limited field of view and bowel gas.
	MRI Abdomen / pelvis	Indicated [B]	0	MRI is the most sensitive and specific problem solving modality for characterizing adnexal masses.

Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
K52. Staging	CT Abdomen / Pelvis	Indicated [A]	☢☢☢	Although staging for ovarian cancer is surgical, pre-operative CT imaging helps identify unresectable disease and delineate disease extent for surgical planning. Best modality for staging disease in the peritoneum.
	MRI Abdomen / Pelvis	Indicated [B]	0	Pre-operative staging with CT is usually sufficient. MR can be used for problem solving if: • There are allergies to contrast material. • Patient is pregnant. • Adnexal lesion detected by US or CT needs further characterization. • Extent of local invasion needs further delineation.
	PET	Specialized investigation [C]	☢☢☢☢	PET is reserved for problem solving in a case-by-case basis to assess loco-regional and distant disease. The role of PET is still evolving and is greatest in the detection of recurrence.
K53. Follow-up	CT Abdomen / Pelvis	Indicated [A]	☢☢☢	CT and MRI may be employed to assess recurrence. CT is widely available and less expensive. Negative examinations do not exclude microscopic disease recurrence.
	MRI Abdomen / Pelvis	Indicated [B]	0	MRI may be used in selected cases where there is known allergy to iodinated contrast material or local recurrence is suspected but cannot be adequately assessed on CT.
Uterus: Cervix				
K54. Diagnosis	MRI	Indicated only in specific circumstances [B]	0	Imaging is performed in selected cases as determined by the Gynecology Oncology specialist.
K55. Staging	MRI Pelvis only	Indicated [A]	0	MRI is the most sensitive and specific imaging modality for LOCAL staging of cervical cancer when compared to CT. CT is best for detection of distant nodes and visceral disease. Usually, both are performed. Some centres now use TRUS for local invasion, depending on availability of expertise.
	CT Abdomen / Pelvis	Indicated [A]	0	MRI is the most sensitive and specific imaging modality for LOCAL staging of cervical cancer when compared to CT. CT is best for detection of distant nodes and visceral disease. Usually, both are performed. Some centres now use TRUS for local invasion, depending on availability of expertise.
	PET-CT	Indicated only in specific circumstances [B]	☢☢☢☢	PET is useful in difficult situations to define the extent of disease with accompanying image registration. Not indicated for early cancers. Level C evidence for advanced cancers. Also useful in assessment of nodal metastases although its impact in this respect on clinical outcome is still being evaluated.

Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
K56. Relapse	MRI Abdomen / Pelvis	Specialized investigation [B]	0	MRI is performed to assesss replapse. It helps assess local tumour recurrence and nodal status and to differentiate post radiation fibrosis from tumour. CT is limited in this regard.
	CT	Indicated [A]	☢☢☢	CT is more useful than MRI in assessing distant metastases. If biopsy of para-aortic nodal metastases is warranted, it is usually performed using CT guidance.
	PET-CT	Indicated [C]	☢☢☢☢	Recommended for women with recurrence who are candidates for pelvic exenteration.
Uterus: Body				
K57. Diagnosis	US / MRI	Indicated [B]	0/0	US is used for detection and triaging for endometrial biopsy. Staging is surgicopathological. MRI is reserved for problem solving and differentiating benign from malignat lesions.
K58. Staging	MRI	Indicated [A]	0	MRI helps delineate myometrial and cervical invasion which are the most important prognostic factors in assessing endometrial cancer. 'One stop' examination. MR and sentinel lymph node biopsy are most accurate for staging.
	CT	Not indicated [B]	☢☢☢	CT performs poorly in assessing myometrial invasion. It is not useful in local staging and is reserved for distant staging to assess retroperitoneal nodal disease and visceral metastases.
Miscellaneous Gynecological Cancers				
Vulvar Cancer				
K59. Diagnosis				Vulvar cancer lesions can be detected visibly or by palpation. Biopsy of suspicious lesions should be performed immediately.
K60. Staging[4]	MRI Pelvis only	Specialized investigation [B]	0	Usually a clinical diagnosis. MRI may assist in complex cases and is the method of choice in assessing local extent and nodal disease.
	CT Abdomen / Pelvis	Specialized investigation [B]	☢☢☢	CT is limited in local staging because of suboptimal soft tissue contrast but is helpful in detecting para-aortic lymphadenopathy and other metastases.
	NM	Specialized investigation [B]	☢☢-☢☢☢	Sentinel node identification using (99m)Tc appears to be the most promising test for accurately excluding lymph node metastases in squamous cell vulvar cancer

4 The role of imaging in patient management is to define the local extent of disease and regional nodal status for treatment planning.

Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
K61. Follow-Up	MRI Abdomen / Pelvis	Specialized investigation [B]	0	MRI is the method of choice to assess local recurrence. Can also assess regional node involvement.
	CT Abdomen / Pelvis	Specialized investigation [B]	☢☢☢	CT is helpful in detecting para-aortic lymphadenopathy and other metastases.
Vaginal Cancer				
K62. Diagnosis				Diagnosis based on clinical symptoms and findings. PAP smear, targeted biopsy or colposcopy to confirm diagnosis.
K63. Staging[5]	MRI Pelvis only	Specialized investigation [B]	0	Method of choice. Can assess both the local extent of disease and regional node involvement.
	CT	Specialized investigation [B]	☢☢☢	CT is limited in local staging because of suboptimal soft tissue contrast but is helpful in detecting para-aortic lymphadenopathy and other metastases.
K64. Follow-Up	MRI	Specialized investigation [B]	0	MRI is the method of choice to assess local recurrence. Can also assess regional node involvement. Vaginal contrast in the form of sterile sonographic gel may be helpful for evaluation of residual or recurrent disease at MRI in post treatment setting.
	CT	Specialized investigation [B]	☢☢☢	CT is helpful in detecting para-aortic lymphadenopathy and other metastases.
Lymphoma				
K65. Diagnosis	CT	Indicated [B]	☢☢☢	For evaluation of extent of clinically suspected adenopathy and selection of site for biopsy.
	NM	Specialized indication [B]	☢☢☢	Being replaced by PET.
K66. Staging	CT of affected areas	Indicated [B]	☢☢☢	CT of Thorax, abdomen and pelvis. Head and neck may be included based on clinical findings.
	MRI	Indicated only in specific circumstances[B]	0	Not routinely used. Can assess for marrow involvement.

5 The role of imaging in patient management is to define the local extent of disease for treatment planning.

(continued on next page)

Clinical/Diagnostic Problem	Investigation	Recommendation (Grade)	Dose	Comment
K66. Staging *(continued)*	PET-CT	Specialized Investigation [B]	☢☢☢☢	1. PET may have a role in staging of Hodgkin lymphoma or non-Hodgkin's lymphoma for patients with apparent limited stage (Stage I and II) being treated with curative intent and/or when imaging is equivocal for differentiating between limited stage disease and advanced stage disease. 2. PET may have a role for apparent limited stage follicular lymphoma and other indolent non-Hodgkin's lymphomas where curative radiation therapy is being considered for treatment.
K67. Follow-up	CXR	Indicated [B]	☢	For evaluation of response to treatment.
	CT	Indicated [B]	☢☢☢	CT of thorax, abdomen and pelvis if suspicion of disease progression or recurrence following treatment.
	MRI	Not indicated initially [B]	0	May be useful is assessing significance of residual mass seen on CT.
	PET-CT	Specialized Investigation [B]	☢☢☢☢	FDG-PET/CT can be used as a problem solving tool where the presence of disease relapse remains indeterminate after routine clinical and diagnostic imaging.
K68. Response Assessment	CT	Indicated [B]	☢☢☢	CT of at least involved area partway through treatment where this information will alter the treatment plan. CT of at least involved area upon completion of treatment where this information will alter the treatment plan.
	MRI	Not indicated initially [B]	0	In select cases where indicated clinically.
	PET-CT	Indicated [A]	☢☢☢☢	1. For the evaluation of residual mass(es) following chemotherapy, in a patient with Hodgkin or non-Hodgkin lymphoma when further potentially curative therapy (such as radiation or stem cell transplantation) is being considered. 2. For the assessment of response in early stage Hodgkin lymphoma following two (2) or three (3) cycles of chemotherapy when chemotherapy is being considered as the definitive single modality therapy.