

 Lakeridge Health	Computed Tomography (CT) Protocoling – Medical Directive	
	Manual: Medical Directives & Delegated Controlled Acts	Original Date: JAN2022
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Authorizing Prescribers

Radiologists working at Lakeridge Health (LH) Oshawa, Bowmanville, Port Perry and Ajax.
Cardiologists working at Lakeridge Health Ajax who perform CT Cardiac Studies.

Authorized to Whom

Medical Radiation Technologists (MRT) employed at LH sites who have the knowledge, skill and judgement to protocol Computed Tomography (CT) requests.

Patient Description/Population

Any adult patient who has been assessed by the Most Responsible Practitioner (MRP) and has a completed CT request or electronic order.

Order and/or Procedure

The order and/or procedures are not presented in sequential order. Any one of or combination may be performed by the MRT upon receipt of the completed CT requisition. Refer to [Table 1: Order Table Form](#) and [Table 2: Scan Priority Levels, By Location and Exceptions](#)

Indications to the Implementation of the Directive

Any patient from the patient description/population who meets the criteria in the order table form and has a fully completed CT Request – must be clear, legible, include clinical history and/or symptoms and is signed/electronic signature by the MRP.

Contraindications to the Implementation of the Directive

The Radiologist or Cardiologist must always be consulted if the MRT is unsure of the protocol or if the patient:

- is less than 18 years old (exception is non-contrast CT head)
- has a known allergy or sensitivity to intravenous contrast
- has prior imaging of the same body part within last month (exception is non-contrast CT head)

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Documentation Requirements

Documentation of an implemented directive will be recorded in the order section of the patient's health record and must include:

- Name of the Medical Directive
- Date
- Name and signature of the implementer including credentials

Review/Evaluation Process

This directive will be reviewed by Diagnostic Imaging every 2 years.

References

College of Medical Radiation Technologists. (2018). *Performing procedures* (WYM-KAS).
https://www.cmrito.org/pdfs/wymkas/performing_procedures_2018.pdf

College of Medical Radiation Technologists. (n.d.). *Standards of practice: Professional practice*. <https://www.cmrito.org/programs/professional-practice/standards-of-practice/>

College of Physicians. (n.d.). *Delegation of controlled acts*. [Information document].

Health Quality Ontario. (n.d.). *Measuring wait times for diagnostic imaging*.
<https://www.hqontario.ca/System-Performance/Measuring-System-Performance/Measuring-Wait-Times-for-Diagnostic-Imaging>

Ontario Health. (2020, December). *DI WTIS clinical indication for scan by priority level examples* (Version 3).

This table must **not** be used independently apart from the Medical Directive

Table 1: Order Table Form

Head and Neck

Protocol	Indication for Protocoling	Contraindications to Protocoling
CT Head Non-contrast	ED or IP request only: Acute Headache Head Injury Stroke/TIA/bleed (any acute onset focal neurological symptoms) Decreased level of consciousness (LOC) Confusion Asymmetric pupils Follow up bleed (ICH, SAH, SDH) Follow up CVA or TIA Chronic headache (greater than 1 month) Dizziness, vertigo, syncope Seizure	Pregnancy MRT unsure of protocol
CT Head With IV contrast	ED, IP or DRCC request only: Brain metastasis	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
Orbits Only With IV contrast	ED or IP request only: Rule out abscess Peri-orbital or orbital cellulitis	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
Sinuses Non-contrast	Chronic sinusitis	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month
Temporal Bones non-contrast	ENT, ED or IP request only: Tinnitus Hearing loss Sensorineural hearing loss (SNHL)	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month

	Middle ear lesion Cholesteatoma	
Facial Bones Non-contrast	ENT, ED or IP request only: Trauma	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month
Temporal Mandibular Joints (TMJ) Non-contrast	Dr. Laur referral only	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month
Neck/Face Non-contrast	ENT, ED or IP request only: Foreign Body Salivary duct stone	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month
Neck With IV contrast	Malignancy workup, (re)staging Mass Retropharyngeal abscess	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
CT Angiography (CTA) Carotids and Circle of Willis (COW) With IV Contrast	TIA/stroke work up Prior to stroke prevention clinic referral Carotid dissection Vertebral dissection	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
Endovascular Treatment (EVT) Candidate (Code Stroke)	ED or IP request only: Code EVT	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month

Thorax

Protocol	Indications for Protocoling	Contraindications to Protocoling
Low Dose Non-contrast	Lung nodule follow up	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month
CT Chest With IV Contrast	Malignancy workup, (re)staging Pleural effusion Empyema	Pregnancy MRT unsure of protocol Patient less than 18 years old

	Pneumonia Chest tube Placement	Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
Chest Non-contrast	Follow up ground glass opacities (GGO) Assess opacity/scarring on CXR	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month
High Resolution CT (HRCT) Non-Contrast	Respirologist referral only: Emphysema Bronchiectasis Interstitial lung disease Pulmonary Fibrosis	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month
Pulmonary Angiogram With IV Contrast	ED or IP request only: Pulmonary Embolism	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
Chest CTA – Dissection protocol Without and with IV Contrast	ED or IP request only: Rule out dissection	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
Cardiac With IV contrast	Cardiologist referral only: Rule out obstructive coronary artery disease (CAD) Rule out coronary anomaly Assess presence, or patency of coronary bypass grafts (CABG) Assess for presence of congenital heart disease	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
Pulmonary Vein (PVI) With IV Contrast LHAP ONLY	Cardiologist referral only: Assess pulmonary vein dimensions and configuration prior to planned Pulmonary Vein Isolation procedure	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
Calcium Score	Cardiologist referral only: Cardiac risk stratification in patients without known coronary disease (i.e. for Coronary Calcium score)	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month

	Assess for possible severe aortic stenosis (i.e. for Aortic Valve calcium score)	
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Abdomen and Pelvis

Protocol	Indications for Protocoling	Contraindications to Protocoling
Abdomen Pelvis Without IV contrast Without oral contrast	Vascular surgeon referral only: Follow up of abdominal aortic aneurysm (AAA)	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month
Routine Abdomen Pelvis With IV contrast +/- oral contrast *Refer to Table 3: Oral Contrast Checklist for CT Abdomen Pelvis with IV contrast	ED or IP request only: Abscess Appendicitis/diverticulitis Small bowel obstruction Post-op complications Rule out leak Colitis or C. Difficile Follow up abscess, collection, diverticulitis, appendicitis or pancreatitis <u>Malignancy workup, (re)staging -must include organ of origin</u> Generalized pain NYD	Pregnancy MRT unsure of protocol Patient less than 18 years old Known allergy or sensitivity to intravenous contrast
Trauma Abdomen Pelvis With IV Contrast	ED or IP request only: Acute Trauma with suspicion of visceral injury or pelvic fracture (stabbing, MVC, gunshot)	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
Renal Colic Non-contrast	Renal colic Flank pain +/- hematuria r/o renal stones	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month
Renal Colic Ultra Low Dose Non-contrast	Urologist referral only: Follow-up known renal or collecting system stone	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month
Urogram With IV contrast	Urologist referral only: Gross Hematuria, Micro hematuria Hematuria Not Otherwise Specified (NOS)	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast

Renal Mass With IV contrast	Initial workup or follow up of renal mass Follow up known renal cell carcinoma (RCC) or renal cancer Follow up post radiofrequency ablation (RFA)	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
Enterogram – Single With IV contrast	Gastroenterologist or General Surgeon referral only: Extent of involvement of Crohn’s disease Query Crohn’s disease	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
Enterogram - Dual With IV contrast	Gastroenterologist or General Surgeon referral only: GI Blood loss/anemia And/or query small bowel mass (Negative gastroscopy and colonoscopy)	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
Bowel/Mesenteric Ischemia With IV contrast	ED or IP request only: Bowel or mesenteric ischemia and patient is greater than 60 years old	Pregnancy MRT unsure of protocol Patient less than 60 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
Active GI Bleed With IV contrast	ED or IP request only: Active GI Bleed	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
Colonography Non-contrast	Query polyp Colon cancer screening	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month
Abdomen and Pelvis CTA With IV contrast	Vascular surgeon referral only: Abdominal Aortic Aneurysm (AAA)	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
Abdomen/Renal Arteries CTA With IV contrast LHAP Only	Query renal artery stenosis	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast

Combination Scans

Protocol	Indications	Contraindications to Coding
CT Neck, Chest With IV contrast	Malignancy workup, (re)staging - <u>must include organ of origin</u>	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
CT Neck, Chest, Abdomen With IV contrast	Malignancy workup, (re)staging - <u>must include organ of origin</u>	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
CT Neck, Chest, Abdomen and Pelvis With IV contrast	Malignancy workup, (re)staging - <u>must include organ of origin</u>	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
CT Chest and Abdomen With IV contrast LHO, LHB ,LHP Only	Malignancy workup, (re)staging - <u>organ of origin must be lung or esophagus</u>	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
CT Chest, Abdomen, Pelvis With IV contrast	Malignancy workup, (re)staging - <u>must include organ of origin</u>	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
CT Chest, Abdomen Pelvis With IV contrast (arterial phase upper abdomen)	Cancer staging/follow-up for Hypervascular primary malignancy (RCC, neuroendocrine, melanoma, chorio CA, thyroid) - <u>must include organ of origin</u>	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
CT Abdomen and Pelvis with Lower Extremity Angio (Runoff)	ED, IP, Vascular surgeon request only: Occlusion Pulseless Leg Ischemia	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
Whole Body (Myeloma)	Oncology request only	Pregnancy MRT unsure of protocol

With IV contrast		Patient less than 18 years old Prior imaging of same body part within last month Known allergy or sensitivity to intravenous contrast
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Spine

Protocol	Indications for Protocols	Contraindications to Protocols
Cervical Trauma Non-contrast	ED or IP request only: Trauma	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month
Lumbar Trauma Non-contrast	ED or IP request only: Trauma	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month

Extremity

Protocol	Indications for Protocols	Contraindications to Protocols
Pelvis Non-contrast	ED or IP request only: Trauma, Fracture	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month
Hip – Unilateral Non-contrast	ED or IP request only: Trauma, Fracture	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month
Shoulder Non-contrast	Trauma, Fracture	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month
Knee Non-contrast	Trauma, Fracture	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month
Extremity Non-contrast	Trauma, Fracture	Pregnancy MRT unsure of protocol Patient less than 18 years old Prior imaging of same body part within last month

Table 2: Scan Priority Levels, By Location and Exceptions

Priority Level	Description
Priority 1 Within 24 hours of order received	Emergent – An examination necessary to diagnose and/or treat disease or injury that is immediately threatening to life or limb.
Priority 2 Within 48 hours of order received	Urgent – An examination necessary to diagnose and/or treat disease or injury and/or alter treatment plan that is not immediately threatening to life or limb. Includes all inpatients except where imaging is unrelated to patient admission based on clinical indication.
Priority 3 Within 10 days of order received	Semi-Urgent – An examination necessary to diagnose and/or treat disease or injury and/or alter treatment plan, where provided clinical information requires that the examination be performed sooner than the Priority 4 benchmark period.
Priority 4 Within 28 days of order received	Non-Urgent – An examination necessary to diagnose/treat disease or injury, where the provided clinical information does not require the study to be performed within the semi-urgent time frame (Priority 3 benchmark period of 10 days.)
Timed – Specified Date Procedure	An examination to be completed after a medically specified time (or future date) period.

Source: Ontario Health, DI WTIS Clinical Indication for Scan by Priority Level Examples. December, 2020 Version 3

Scan Priority Levels Location & Exception Rules

Priority 1 = Emergency Department

Priority 2 = In-Patients

Priority 3 = Urgent Out-Patients – Requisition indicates Urgent or Stat

Priority 4 = Out-Patients with the Exception of: Re-staging, Empyema, Pneumonia, Query Crohn’s disease acute exacerbation, Gross Hematuria (Urologist request) are priority 3

Table 3: Oral Contrast Checklist for CT Abdomen & Pelvis with IV Contrast

Indication	Omnipaque	Water	Readi -Cat
BMI less than or equal to 25	<input checked="" type="checkbox"/>		
Age less than or equal to 18	<input checked="" type="checkbox"/>		
History of GI Cancer (including cancers of the esophagus, stomach, small intestine and colon)	<input checked="" type="checkbox"/>		
Ovarian Cancer	<input checked="" type="checkbox"/>		
Peritoneal Cancer (including mesothelioma)	<input checked="" type="checkbox"/>		
Recent abdominal surgery to rule out leak	<input checked="" type="checkbox"/>		
Complex bowel pathology to rule out fistula, abscess	<input checked="" type="checkbox"/>		
Contraindication to IV contrast (due to renal failure)	<input checked="" type="checkbox"/>		
Bowel Ischemia		<input checked="" type="checkbox"/>	
Bowel Obstruction		<input checked="" type="checkbox"/>	
Omnipaque allergy and NOT allergy prepped			<input checked="" type="checkbox"/>
For all other cases: 900ml H ² O as tolerated, do not delay imaging			