

This primary care pathway was co-designed provincially by Primary Care Providers, Specialist Physicians (specialties), Patient and Family Advisors, and the Alberta Health Services (AHS) Provincial Pathways Unit. It is intended to be used in conjunction with specialty advice services, when required, to support care within the medical home.

EXPANDED DETAILS

Pathway Primer

A renal mass is an abnormal growth in the kidney. Most renal masses are benign; however, a significant number of them require further intervention [1]. Due to the advancement of imaging tests such as CT, MRI and ultrasound, most renal masses are detected incidentally during other workups, not during physical exam or for signs and symptoms.

Renal masses are classified into either solid, cystic or complex cystic masses. The main concern for solid masses and cystic masses with a solid component (complex) is they are suspicious for renal cell carcinoma, the most common kidney cancer, although there are other types of kidney cancer that may require different treatment. In 2022, it is estimated that 8100 Canadians (5400 men and 2700 women) were diagnosed with kidney and renal pelvis cancer, and that 1300 Canadians will die from kidney and renal pelvis cancer [3, 4].

This pathway focuses on the management of adult patients when a renal mass is identified on diagnostic imaging and will guide necessary investigations and referral triggers to urology when indicated.

1. Renal Mass identified on diagnostic imaging

- Renal masses are classified as either solid or cystic categories and a significant proportion of them will require further investigation once identified on diagnostic imaging [1].
- Imaging modalities such as CT, MRI, or ultrasound are used to diagnose renal masses.

2. Cystic Renal Mass(es)

- Most renal masses detected incidentally are simple cysts and do not require further radiological investigation or consultation by a urologist. It is estimated that up to one-third of individuals over 60 years of age will be diagnosed with at least one simple renal cyst following abdominal imaging [6]. This pathway offers guidance using the CUA guideline [CUA guideline on the management of cystic renal lesions.pdf].
- Simple renal (kidney) cyst is a pocket of fluid that originates from the surface of the kidney and is contained by a thin wall. One or more simple cysts may form within the kidney and are the most common type of renal cyst [8]. Renal cysts are defined using sonographic criteria and include the absence of internal echoes, posterior placement, round/oval shape and sharp, thin posterior walls. If all criteria are met the cyst is benign and no follow-up is required.
- **Complex** renal (kidney) cysts have a chance of being or becoming cancerous and look different from a simple cyst. Complex kidney cysts may be solid (not filled with fluid), irregularly shaped or have a thick outer wall. Complex cysts are far less common than simple cysts [9]. Renal cysts that do not meet the rigid criteria of a simple cyst require further investigation with a renal mass protocol CT or MRI and clinicians rely on the Bosniak Classification System to identify benign versus malignant masses to guide treatment options.

Bosniak Classification v2019 and management recommendations

Bosniak v2019 CT scan classification	Recommendations
Bosniak category I (simple renal cyst) • Well-defined, thin (≤2mm), smooth wall • No septa or calcification • Homogenous simple fluid (-9 to 20 HU) • The wall may enhance	No follow-up required
 Bosniak category II 6 types; all with well-defined, smooth wall 1. Cystic mass with thin (<2mm) and few (1-3) septa; septa and wall may enhance; calcification of any type 2. Homogenous hyperattenuating (>70 HU) at non-contrast CT 3. Homogenous non-enhancing masses >20 HU at renal mass protocol, may have calcification(s) 4. Homogenous mass -9-20 HU at non-contrast CT 5. Homogenous mass 21-30 HU at portal venous-phase CT 6. Homogenous low-attenuation masses that are too small to characterize 	No follow-up required
 Bosniak Category IIF Smooth, minimally thickened (3mm), enhancing wall Smooth, minimally thickened (3mm) of one or more enhancing septa Many (>4) smooth, thin (<2mm), enhancing septa 	 Follow-up recommended Imaging every 6-12 months for the first year and annually for 5 years if no progression
 Bosniak Category III One or more enhancing thick (≥4mm) wall or septa One or more enhancing nodule(s) (displaying ≤3mm convex protrusion with obtuse margins – perpendicular axis) 	 Active surveillance if <2cm Active surveillance or surgical excision if 2-4 cm Surgical excision if >4cm Thermal ablation in select cases
 Bosniak Category IV One or more enhancing nodule(s) (displaying >4mm convex protrusion with obtuse margins – perpendicular axis) One or more enhancing nodule(s) (convex protrusion of any size with acute margins) 	 Active surveillance if < 2 cm Active surveillance or surgical excision if 2-4 cm

For the v2019 version MRI classification, please refer to the Silverman et al original publication [5]. CT: computerized tomography; HU: Hounsfield units

3. Symptoms

Renal masses are frequently found incidentally without signs or symptoms. The triad of hematuria, flank pain and flank mass are seen infrequently as imaging has often detected the mass before symptomatology. However, if these findings are present along with the detection of a simple cyst, then it warrants further evaluation [1]:

- Gross hematuria
- Persistent flank pain

4. Solid Renal Mass(es)

- **Suspicious for Malignancy**: The main concern for solid renal masses is malignancy and while investigating for this it is also important to identify benign tumours such as oncocytoma, angiomyolipoma, and adenoma that may require active surveillance with no intervention needed.
- The most critical indication of malignancy is the size of a tumour and is commonly divided into two size categories: less than 4 cm and more than 4 cm. Larger tumours have a higher malignant potential than smaller tumours. Up to 40% of 2 cm renal masses are benign and only a small percentage, 10%, are high-grade renal cell carcinoma. In contrast, 30% of 4 cm or larger renal masses are high- grade cancer [1].

5. Angiomyolipoma (AML)

- Angiomyolipoma's are **benign** neoplasms composed of varying amounts of blood vessels, smooth muscles, and adipose tissue. While being the most frequently occurring benign solid renal tumour, their incidence in the general population is still uncommon but with the increased use of intra-abdominal sonography and cross-sectional imaging, more have been incidentally identified [7].
- Diagnosis All cases of suspected renal AML should be confirmed with either contrast-enhanced CT or MRI

6. Investigations for complex cysts and solid renal mass(es) suspicious for malignancy

• Laboratory Testing:

- o Routine bloodwork including CBC, creatinine, urea, calcium, albumin, AST, ALT, ALP, bilirubin
- Diagnostic Imaging: A complex cyst or solid renal mass found on ultrasound require further characterization
 - o Contrast-enhanced Renal Mass Protocol CT/MRI is recommended
 - o Chest X-Ray is recommended for solid renal mass to assess for pulmonary metastasis

7. Referral Criteria

- Bosniak Category I or II (simple renal cyst(s)) with no symptoms require no further investigation or urologic consultation as they are considered to be benign
- Complex cysts and solid renal mass require Renal Mass protocol CT/MRI
 - Bosniak Category IIF primary care provider to organize follow-up imaging q6-12 months for the first year and then yearly x 5 years. If progression to next Bosniak category (III or IV) is noted on any surveillance imaging refer to urology for assessment and management. Laboratory investigations are not mandatory
 - Bosniak Category III & IV or any Bosniak Category cyst with symptoms refer to urology for assessment and management
 - ALL solid renal mass(es) suspicious for malignancy require referral to urology for assessment and management
 - Angiomyolipoma > 4 cm require a referral to urology for assessment
 - Angiomyolipoma < 4 cm do not often require a urology consult but should obtain non-urgent urology advice using preferred advice options

8. Referral Process

Referral pathways are guidelines to help referring providers know what information, labs and diagnostic imaging are required with their referral to a specialty. These pathways are co-designed with Primary and Specialty Care, AHS Operations, and patients to ensure the right amount of information is included throughout the referral process to triage the patient as quickly as possible. To ensure referring providers have referral information at their fingertips, referral pathways may link to clinical pathways when available. AHS manages referral pathways and extensive work is ongoing as part of the <u>Alberta Surgical Initiative</u>. If you have questions or want to know more about the referral pathway development process, please email <u>access.ereferral@ahs.ca</u>.

- Urgent Referral Call surgeon on call via RAAPID or call 911.
- Follow the <u>Provincial Urology</u>, Adult Referral Pathway.
- <u>Alberta Referral Directory</u> is also a helpful resource for all referral information.

BACKGROUND

About this pathway

- This pathway was developed in collaboration with urologists, radiologists, medical oncologists, primary care
 physicians, patient/family advisors, provincial pathways unit and members of the former Cancer Strategic Clinical
 Network (CSCN).
- Condition-specific clinical pathways are intended to offer evidence-based guidance to support primary care providers in caring for patients with a range of clinical conditions.

Authors and conflict of interest declaration

- This pathway was reviewed and revised under the auspices of Cancer SCN in 2024, by a multi-disciplinary team.
- Names of the content creators and their conflict-of-interest declarations are available on request by emailing AlbertaPathways@ahs.ca.

Pathway review process, timelines

• Primary care pathways undergo scheduled review every two to three years, or earlier if there is a clinically significant change in knowledge or practice. The next scheduled review is October 2027. However, we welcome feedback at any time. Please send us your feedback by emailing <u>AlbertaPathways@ahs.ca</u>.

Copyright information

This work is licensed under a Creative Commons Attribution-Noncommercial-Share Alike 4.0 International license. You are free to copy, distribute and adapt the work for non-commercial purposes, as long as you attribute the work to Alberta Health Services and abide by the other license terms. If you alter, transform, or build upon this work, you may distribute the resulting work only under the same, similar, or compatible license. The license does not apply to content for which the Alberta Health Services is not the copyright owner.



© 2024 Alberta Health Services



PROVIDER RESOURCES

Advice Options

You can request non-urgent advice at any point when uncertain about medications, next steps in treatment, investigations, or resources available.

For emergency medical attention call **RAAPID** for on-call surgeon, or 911.

Zone	Program	Online Request	Phone Number
Urgent Telephone			
All Zones	RAAPID CHD RAAPID Rend Acces. Adva. Pacement, Hormation & Destination	N/A	North: 1-800-282-9911 or 780-735-0811 South: 1-800-661-1700 or 403-944-4486
Non-Urgent Electronic			
All Zones	Netcare eReferral		N/A
	eReferral		
Non-Urgent Telephone			
Edmonton, North	<u>ConnectMD</u>	Online Request	1-844-633-2263
	ConnectMD		

PATIENT RESOURCES

Health information and tools for Albertans	Kidney (Renal Cell) Cancer (alberta.ca)
A patient-led organization to support Canadians touched by kidney cancer	Main Home Kidney Cancer Canada
Living well with cancer supports and resources	Home (wellspring.ca)
Cancer information for the public	What is kidney cancer? Canadian Cancer Society

REFERENCES

- Ballard BD, Guzman N. Renal Mass. [Updated 2023 Jan 2]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK567761/
- Mittal MK, Sureka B. Solid renal masses in adults. Indian J Radiol Imaging. 2016 Oct-Dec;26(4):429-442. doi: 10.4103/0971-3026.195773. PMID: 28104933; PMCID: PMC5201069.
- 3. Renal Cell Carcinoma (albertahealthservices.ca)
- 4. 2022_prevalence_report_final_en.pdf (cancer.ca)
- Silverman SG, Pedrosa I, Ellis JH, et al. Bosniak classification of cystic renal masses, version 2019: An update proposal and needs assessment. Radiology 2019;292:475-88. https://doi.org/10.1148/ radiol.2019182646
- Richard, Patrick & Violette, Philippe & Jewett, Michael & Pouliot, Frederic & Leveridge, Michael & So, Alan & Whelan, Thomas & Rendon, Ricardo & Finelli, Antonio. (2017). CUA guideline on the management of cystic renal lesions. Canadian Urological Association Journal. 11. 66. 10.5489/cuaj.4484.
- Guo, Y. ., Kapoor, A., Cheon, P. ., So, A. I. ., Lattouf, J.-B. ., & Jamal, M. (2020). Canadian Urological Association best practice report: Diagnosis and management of sporadic angiomyolipomas. Canadian Urological Association Journal, 14(11), E527–36. https://doi.org/10.5489/cuaj.6942
- 8. Garfield K, Leslie SW. Simple Renal Cyst. 2023 Aug 28. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan–. PMID: 29763075.