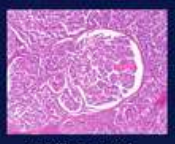
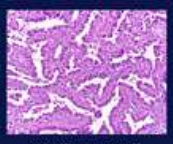
When to think about hereditary RCC

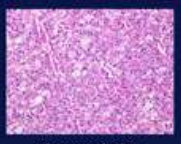
Patients with any renal tumour (benign or malignant) AND any one of the following:

a. Bilaterality or multifocality
b. Onset of ≤50 years of age
c. 1st or 2nd degree relative with any renal tumour
d. Pneumothorax (BHD/FLCN)
e. Dermatologic findings:
   i. Skin leiomyomas (HLRCC/FH)
   ii. Skin fibrofolliculomas/trichodiscomas (BHD/FLCN)
f. Associated tumours:
   i. Pheochromocytoma/paraganglioma (VHL, SDH)
   ii. Hemangioblastoma of the retina, brainstem, cerebellum or spinal cord (VHL)
   iii. Early onset of multiple uterine fibroids (<30 years of age) (HLRCC/FH)
g. Lymphangiomyomatosis (TSC)
h. Childhood seizure disorder (TSC)

Patients with non-clear cell RCC with unusual associated features, such as:

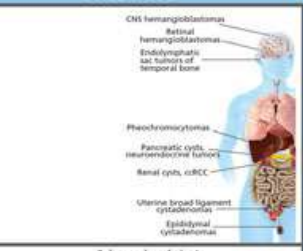
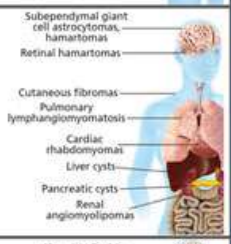
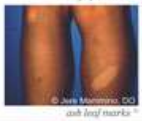
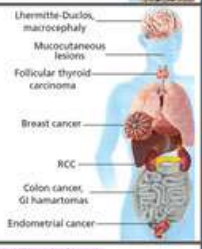
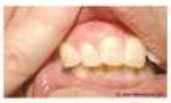
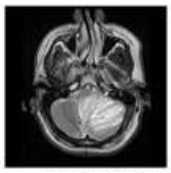
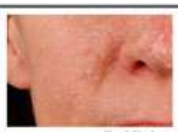
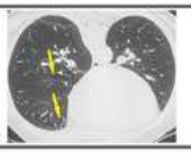

papillary type I


papillary type II


chromophobe, oncocytoma, oncocytic hybrid

Patients, with or without RCC, who report a family member with a known clinical or genetic diagnosis of any one of the syndromes in the table below;

Patients with RCC and history of a second cancer suggestive of any one of the syndromes below:

ASSOCIATED CLINICAL FINDINGS	SYNDROME / *GENE* / (RCC HISTOLOGY)	SUGGESTED SURVEILLANCE IN ADULTS
	**Von Hippel-Lindau** *VHL* (ccRCC)	- Annual imaging alternating between US and MRI - Annual ophthalmologic examination - Annual 24-hour urine catecholamines/metanephrines, plasma metanephrines - Annual audiometry - MRI of brain and spine every 2y
	**Tuberous sclerosis complex** *TSC1/TSC2* (Angiomyolipoma, RCC)	- MRI of abdomen every 1–3y - MRI of brain every 1–3y (age ≥25 y) ± EEG - CT of chest for women every 5-10y or symptomatic males - Annual dermatologic examination - Dental exam every 6mo - Annual ophthalmologic examination - ECG every 1–3y  angiofibromas  ash leaf marks
	**PTEN hamartoma syndrome/ Cowden syndrome** *PTEN* (various)	All patients: - US of abdomen every 1-2y (age ≥40y) - Annual US of thyroid - Colonoscopy every 5y (age ≥35y), - Dermatologic examination Women: - Clinical breast exam every 6-12mo (age ≥25y) - Annual mammography and MRI of breast (age ≥30y) - Annual random endometrial biopsies and/or transvaginal US (age ≥30y)  mucocutaneous papillomas  Lhermitte-Duclos disease
 < Papillary type I histology	**Hereditary papillary RCC (HPRCC)** *MET* (Papillary type I)	- Annual MRI of abdomen
 < cutaneous leiomyomas	**Hereditary leiomyomatosis and RCC (HLRCC)** *FH* (Papillary type II)	- Annual MRI of abdomen - Dermatologic examinations every 1–2y - Annual gynecologic assessment and transvaginal US
Paraganglioma, pheochromocytoma, GI stromal tumors	**SDH-associated kidney cancer** *SDH* (ccRCC, chromophobe, oncocytoma)	- Annual MRI of abdomen and MRI of head and neck - Annual 24-hour urine catecholamines/metanephrines, and plasma metanephrines
 fibrofolliculomas	**Birt-Hogg-Dubé (BHD)** *FLCN* (Oncocytoma, mixed oncocytic, chromophobe)	- Annual CT or MRI of abdomen or every 3y in persons without renal lesions - Baseline CT of chest - Annual dermatologic examination  multiple lung cysts (cerrous) can lead to pneumothorax
Uveal melanoma, melanoma, mesothelioma	**BAP1 Hereditary Cancer Syndrome** *BAP1* (ccRCC)	- Not established; consider annual abdominal imaging - Annual dermatologic assessment - Annual ophthalmologic assessment
Multiple cancers: - Sarcoma - breast cancer - brain tumours - adrenocortical carcinoma - leukemia, lymphoma	**Li-Fraumeni Syndrome** *TP53* (various)	- US of abdomen every 6mo - Annual rapid full body MRI - Annual MRI of brain - CBC, LDH, ESR every 6mo - Annual mammography and MRI of breast - Colonoscopy every 2-5y - Annual dermatologic examinations

UHN Princess Margaret Cancer Centre

Monthly Renal Genetics Rounds
3rd Thursday Monthly GU Clinic North
Submit cases to Rehab Chahin
rehab.chahin@uhn.ca

Referral: Dr. Raymond Kim MD/PhD
Medical Geneticist
Princess Margaret Cancer Centre
fax 416-619-5523
raymond.kim@uhn.ca

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[Thai H. Ho and Eric Jonasch; 2014]; [Kidney Cancer Research Network of Canada; 2013]; [P.L. Choyke, G.M. Glenn, M.M. Walther, et al., 2003]; [Jere Mammino, AOCD; 2015]; [WebPathology, 2015]; [Ed Cowen, NIH, NCI, 2015]; [HLRCC Family Alliance; 2015]; [Lieke M. C. Gijezen et al.; 2014]; [Frank Gaillard et al.; Radiopaedia.org; 2015]

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