



Incidentalomas: I've found it, now what?

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Incidentalomas

- Incidental findings on imaging studies
- Increasing incidence due to widespread use of imaging in clinical practice
- Concerns
 - What is the clinical significance? Is this cancer?
 - What is the appropriate evaluation, management, and follow-up?
- Many recommendations based on **expert opinion** and extrapolation from observational studies



Agenda – concentrate on SIX incidentalomas

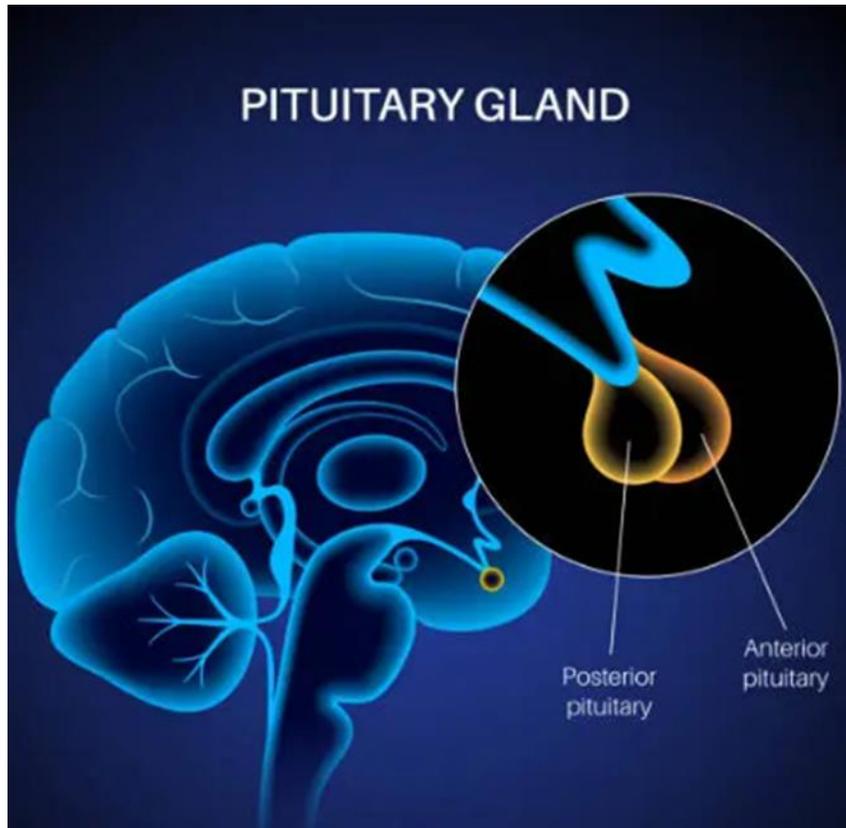
- Pituitary
- Thyroid
- Lung
- Adrenal
- Renal
- Ovarian



Pituitary Case

- 45 M for \$2 mil term life. Admitted to ER visit with brain imaging last year for small concussion while playing soccer with his friends.
- APS obtained
 - Symptoms in ER: none reported; neurologically intact
 - MRI brain: a **5 mm non-enhancing lesion** in **anterior pituitary**; stalk was midline with no compression of optic chiasm
- What is the mortality and morbidity concern?

Pituitary Gland



Hormones	Hypopituitarism	Hyperpit/Excess
Anterior lobe		
ACTH (corticotropin)	Adrenal insufficiency	Cushing's disease
FSH, LH	Hypogonadism	(very rare)
Growth Hormone (GH)	GH deficiency	Acromegaly
Prolactin	(rare)	Prolactinoma
TSH	Secondary hypothyroidism	(very rare)
Posterior lobe		
ADH (vasopressin)	Diabetes insipidus	SIADH
oxytocin	(rare)	(very rare)

MRI brain: a 5 mm non-enhancing lesion in anterior pituitary; stalk was midline with no compression of optic chiasm



Pituitary Incidentaloma (10-38% prevalence on MRI in adults)

- MRI with pituitary protocol – preferred imaging study
- Functioning (8.8-24%) vs. Nonfunctioning
 - ALL screen for hyperprolactinemia and acromegaly
 - ≥ 6 mm eval for hypopituitarism
 - ≥ 10 mm eval for hyper- and hypopituitarism
- Functioning – refer/treat as appropriate
- Nonfunctioning – Monitor vs. Resect
 - 2-4 mm no further imaging or blood tests vs. MRI at 1 year
 - 5-9 mm MRI yearly for 2 to 3 years (extend interval with stability)
- Lesions ≥ 1 cm are more likely to grow and cause symptoms
 - **Eye exam with visual field testing** (if deficit, refer to neurosurgery)
 - Repeat MRI, visual fields and labs at 6 months and 1 year then yearly for 3 years (extend interval with stability)

Differential Dx

- Nonfunctioning adenoma
- Rathke's cleft cyst
- Prolactinoma
- Other functioning adenoma
- Hyperplasia
- Malignant tumors

Functioning vs. Nonfunctioning

- Prolactin
- IGF-1
- AM cortisol
- TSH/free T4
- LH/FSH
- AM Testosterone (men)
- Estradiol (women)
- ACTH
- 24-hr urine free cortisol

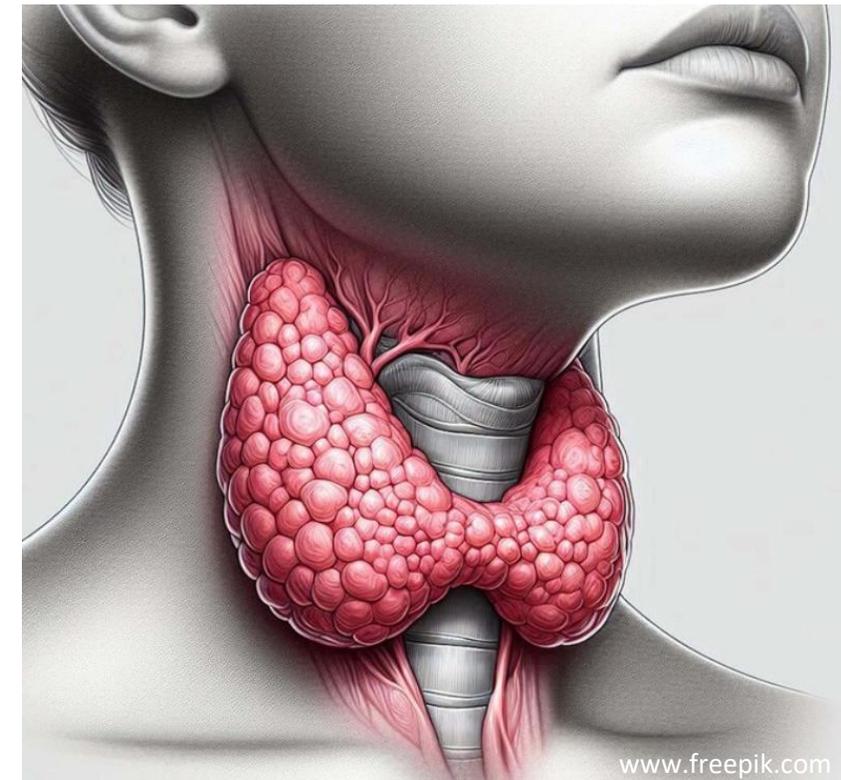


Pituitary Incidentaloma

- APS, cont. Had follow-up visit with PCP a week after MRI. **No symptoms** suggestive of hormonal imbalance, no changes in vision, libido, or energy levels. **A comprehensive endocrine panel** was ordered with serum cortisol, ACTH, prolactin, TSH, free T4, LH, FSH, and IGF-1 all **within normal limits**.
- Diagnosis: incidental non-functioning pituitary microadenoma
- Plan: observation, f/u with Endocrine in 6-12 months, repeat MRI in 1 year to assess for growth/changes, monitor for any symptoms
- Underwriting decision?

Thyroid Case

- 50 y/o female with **palpable thyroid nodule** found on routine physical exam, no past medical history, no family history of thyroid cancer, no radiation exposure, no symptoms, TSH normal
- Thyroid US revealed a **1.4 cm solid, hypoechoic** nodule with regular margins, no evidence of any lymphadenopathy
- No TI-RADS score mentioned



Thyroid Nodules

- 90% of nodules are benign

Benign	Malignant (4-6%)
Multinodular goiter	Papillary carcinoma
Hashimoto's thyroiditis	Follicular carcinoma
Cysts	Medullary carcinoma
Follicular adenomas	Anaplastic carcinoma
Hurthle cell adenoma	Primary thyroid lymphoma
	Metastatic carcinoma (breast, kidney, etc.)



Risk factors for malignancy

- Neck irradiation
- FHx thyroid cancer
- Age < 30
- Age > 70



American College of Radiology (ACR)

ACR Reporting and Data Systems (RADS)

- Expert-devised guidelines endorsed by ACR
- Standardized framework
- Facilitate effective communication
- Enhance consistency in reports
- Majority are related to cancer imaging

Key features

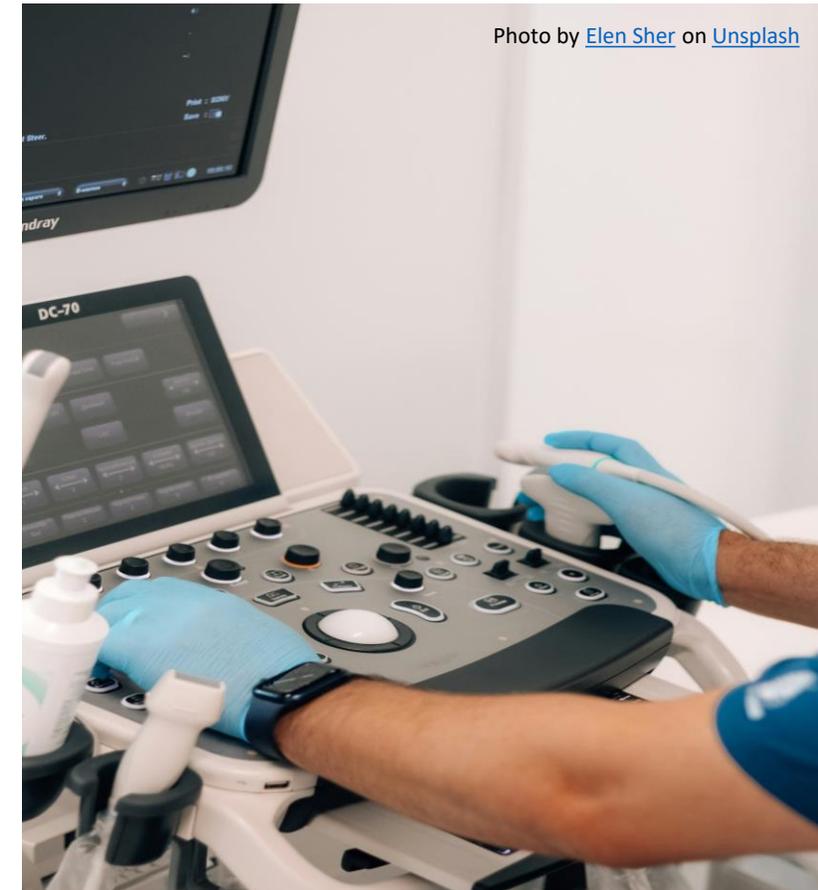
- Standardized terminology
- Report organization
- Assessment structure
- Classification system
- Clinical recommendations and guidance

“The goal of the **ACR**[®] RADS is to **reduce the variability of terminology** in reports and to **ease communication** between radiologists and referring physicians.”¹

<https://www.acr.org/Clinical-Resources/Clinical-Tools-and-Reference/Reporting-and-Data-Systems>

TI-RADS (Thyroid) – 2017 v.1

- American College of Radiology
- Thyroid Imaging Reporting and Data System
- Risk stratification for **thyroid nodules**
- Incidental findings on CT, MRI, PET, or US of the thyroid/carotid
- **Recommendations for which nodules warrant FNA biopsy**
- Free online calculators available



ACR TI-RADS White Paper <http://dx.doi.org/10.1016/j.jacr.2017.01.046>

What is the TI-RADS for our case?



TI-RADS (Thyroid) – 2017 v.1

1.4 cm solid, hypoechoic nodule with regular margins

Composition

- Spongiform, cystic, or almost completely cystic (0 points)
- Mixed solid and cystic (1 point)
- Solid or almost completely solid (2 points)

Echogenicity

- Anechoic (0 points)
- Hyperechoic or isoechoic (1 point)
- Hypoechoic (2 points)
- Very hypoechoic (3 points)

Echogenic Foci

- None or large comet-tail artifacts (0 points)
- Macrocalcifications (1 point)
- Peripheral (rim) calcifications (2 points)
- Punctate echogenic foci (3 points)

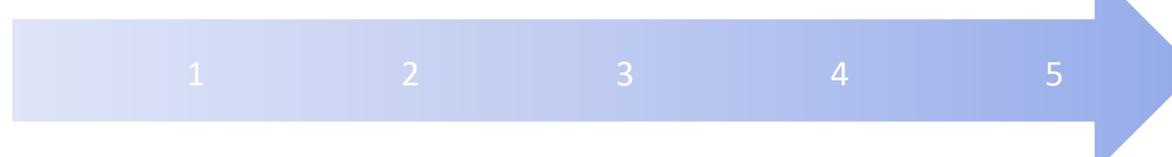
Shape

- Wider than tall (0 points)
- Taller than wide (3 points)

Margin

- Smooth or ill-defined (0 points)
- Lobulated or irregular (2 points)
- Extrathyroidal extension (3 points)

Points	Category	Designation	Recommendation
0 to 1	TR1	Benign	No FNA
2	TR2	Not suspicious	No FNA
3	TR3	Mildly suspicious	FNA if lesion ≥ 2.5 cm or follow if lesion ≥ 1.5 cm
4 to 6	TR4	Moderately suspicious	FNA if lesion ≥ 1.5 cm or follow if lesion ≥ 1 cm
7 to 17	TR5	Highly suspicious	FNA if lesion ≥ 1 cm or follow if lesion ≥ 0.5 cm



ACR Thyroid Imaging, Reporting and Data System (TI-RADS): White Paper of the ACR TI-RADS Committee - Journal of the American College of Radiology



Thyroid Case

- Thyroid nodules that do not meet sonographic criteria for FNA
 - should be monitored
 - with periodic ultrasonography
 - frequency depends on the sonographic features of the nodule(s)
 - ranging from 6 to 24 months

Intervals for US Examinations during Active Surveillance	
Society	US evaluation
Six Italian Societies (2018)	Every 6 months in the first 2 years and once a year thereafter
ESMO (2019)	Every 6-12 months
JAES (2020)	Once or twice a year
JAES (2021)	Every 6 months in the first 1-2 years and once a year thereafter
SFE/AFCE/SFNM (2022)	Every 6 months in the first year and once a year until the end of the 5 th year, then at 7 years, then every 2-3 years (level of evidence ++, Grade B)
Polish Scientific Societies (2022)	Every 6 months in the first 2 years and once a year thereafter (low quality of evidence, weak recommendation)
SBEM (2022)	Every 6 months in the first 2 years and once a year thereafter

US, ultrasonography; ESMO, European Society for Medical Oncology; JAES, Japanese Association of Endocrine Surgeons; SFE, French Society of Endocrinology; AFCE, French Association of Endocrine Surgery; SFNM, French Society of Nuclear Medicine; SBEM, Brazilian Society of Endocrinology and Metabolism.

Endocrinology and Metabolism 2024;39(1):47-60.
DOI: <https://doi.org/10.3803/EnM.2024.1937> Published online: February 15, 2024



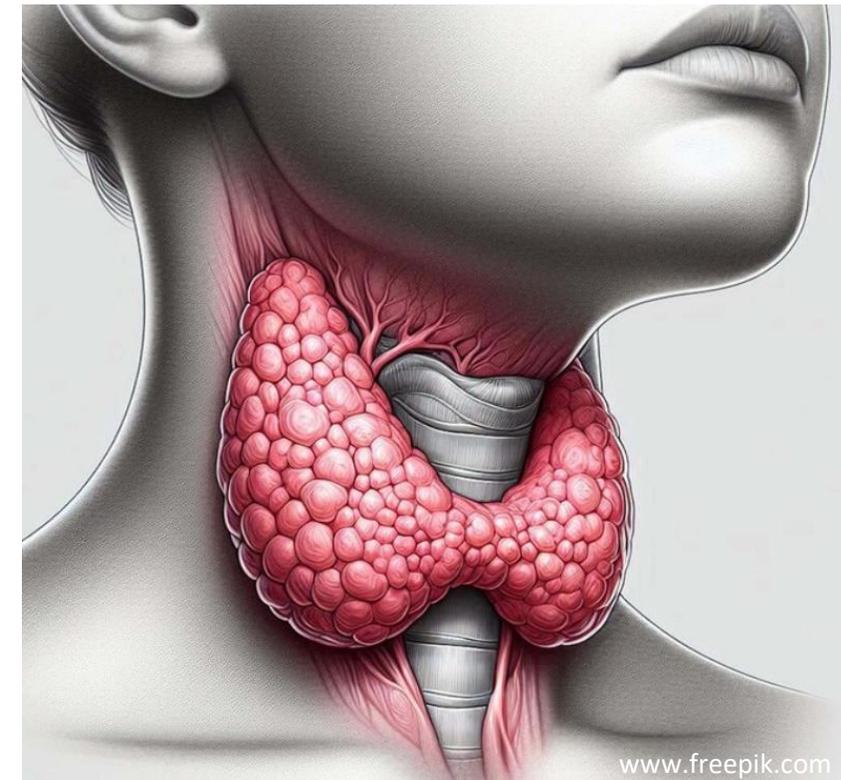
I-TIRADS

- Other countries have also developed categories
 - American Thyroid Association (ATA, 2015)
 - Europe (EU-TIRADS, 2017), Korea (K-TIRADS, 2016), China (C-TIRADS)
- **International Thyroid Imaging Reporting and Data System**
 - European Thyroid Association
 - Italian Association of Clinical Endocrinologists
 - Korean Society of Thyroid Radiology
 - American College of Radiology
 - Phase 1 (2023), Phase 2 Recommendations PENDING

<https://pubs.rsna.org/doi/full/10.1148/radiol.231481>

Thyroid Case

- 50 y/o female with **palpable thyroid nodule** found on routine physical exam, no past medical history, no family history of thyroid cancer, no radiation exposure, no symptoms, TSH normal
- Thyroid US revealed a **1.4 cm solid, hypoechoic** nodule with regular margins, no evidence of any lymphadenopathy
- TI-RADS 4
- **Underwriting decision?**





Lung/Pulmonary Incidentalomas (8-51% prevalence on CT)

- **Solitary Pulmonary Nodule (SPN)** – small (≤ 30 mm), well-defined, and surrounded by normal lung parenchyma
- Majority are benign
- Chest CT without contrast – preferred imaging study
- **Determine risk for malignancy** (low $<5\%$, medium, high $>65\%$)
 - Risk factors for malignancy: age, smoking history, history of lung cancer or other malignancy, family history, asbestos exposure, irregular spiculated margins, upper lobe location, subsolid (ground-glass)
 - Calculators available online ([Lung Nodule Risk Calculators https://www.sts.org/lung-nodule-risk-calculators](https://www.sts.org/lung-nodule-risk-calculators) | STS)
- Stability by CT over time (2+years) is favorable (for solid nodules growth = >2 mm increase in diameter)

Differential Dx

- Residual scar tissue
- Benign granuloma
- Hamartoma
- Lipoma
- Fibroma
- Primary lung cancer
- Lung metastases
- Carcinoid tumor
- Lymphoma



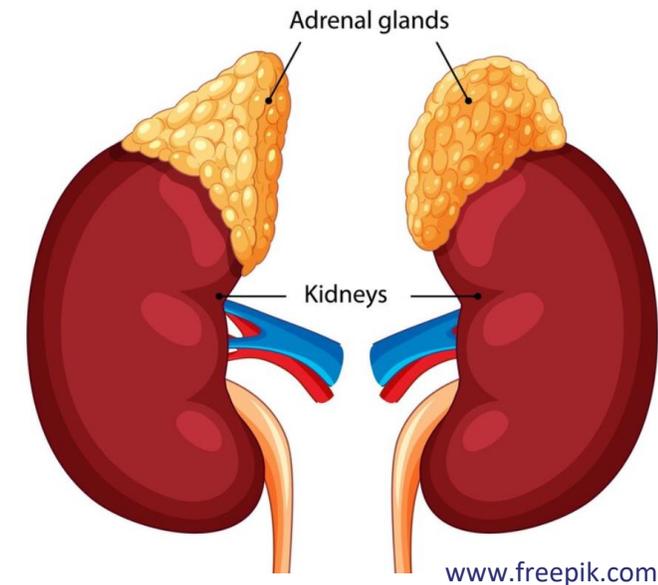
Fleischner Society Guidelines (2017)

<u>SOLID NODULES</u>	<6 mm	6-8 mm	>8 mm
SINGLE			
Low risk	No routine follow-up	CT at 6-12 months, then consider at 18-24 months	Consider CT at 3 months, PET/CT or tissue sampling
High risk	Optional CT at 12 months	CT at 6-12 months, then 18-24 months	Consider CT at 3 months, PET/CT or tissue sampling
MULTIPLE*			
Low risk	No routine follow-up	CT at 3-6 months, then consider 18-24 months	CT at 3-6 months, then consider 18-24 months
High risk	Optional CT at 12 months	CT at 3-6 months, then if persistent at 18-24 months	CT at 3-6 months, then if persistent at 18-24 months

<u>SUBSOLID</u>	<6 mm	≥6 mm
SINGLE		
Ground-glass	No routine follow-up	CT at 6-12 months, then every 2 years until 5 years
Part solid	No routine follow-up	CT at 3-6 months, then if persistent and solid component remains <6 mm, annual CT until 5 years
MULTIPLE*	CT at 3-6 months If high risk, repeat CT at 2 and 4 years	CT at 3-6 months Subsequent management based on most suspicious nodule(s)

Adrenal Case

- 65 F for \$5 mil term life. Hx HTN controlled on lisinopril 20 mg/day. No history of prior cancer.
- APS obtained for amount
 - Two years prior to application underwent abdominal CT to evaluate transient right lower quadrant abdominal pain
 - CT abdomen revealed a **2.1 cm left adrenal nodule (26HU)**; remainder of CT was normal.
 - CPE 6 months ago was normal. BP wnl. No abdominal pain. CBC, CMP normal.
- What is the mortality concern?





Adrenal Incidentaloma (3-4% prevalence on CT and MRI)

- Mass lesion on adrenal gland ≥ 1 cm; only 1.2% malignant (all > 5cm)
- Most (71-84%) are benign, non-functional adrenal adenomas
- Preferred imaging
 - Non-contrast Abdominal CT
 - Second-line imaging – washout CT or chemical shift MRI

Differential Dx

Benign non-functional

- adenoma
- ganglioneuroma
- myelolipoma
- cyst

Benign functional

- Cortisol-secreting adenoma
- Aldosterone secreting adenoma
- Pheochromocytoma

Malignant

- Carcinoma
- Metastases
- Pheochromocytoma



Adrenal Incidentaloma

Malignant features

- Characteristics on non-contrast CT
 - inhomogeneous, irregular shape
 - larger lesions (>4cm)
 - higher attenuation (> 20 HU)
 - tumor calcification

Metastatic lesions rare in patients w/out prior history of cancer
(lung, renal cell, and melanoma)
Primary adrenal carcinoma (1.9%)
Metastases (0.7%)

CT abdomen **2.1 cm left adrenal nodule (26HU)**

Benign features

- Characteristics on non-contrast CT
 - homogeneous, well-circumscribed
 - smaller lesions (<4cm)
 - lower attenuation (< 10 HU) (same density as fat)
 - Large areas of macroscopic/bulk fat (suggests benign myelolipoma)
- Indeterminate lesions need secondary imaging with washout CT or chemical shift MRI



Adrenal Incidentaloma – Adrenal Washout CT

CT ABDOMEN ADRENAL W WO CONTRAST

Collected on Jun 26, 2025 10:08 AM

PROCEDURE: CT ABDOMEN ADRENAL
TRIPLE PHASE

HISTORY: Indeterminate 2.1 cm left
adrenal nodule seen on prior CT

TECHNIQUE: Helical CT of the abdomen
was performed before and after the
administration of non-ionic intravenous
contrast using the department adrenal
protocol.

COMPARISON: CT abdomen pelvis
without contrast, 06/20/2025.

FINDINGS:

Right Adrenal Gland: No nodule.

Left Adrenal Gland:

Nodule: One

Measurement: 2.9 x 2.7 x 2.1 cm (3/38 and
7/72)

Unenhanced appearance: Homogenous

Unenhanced attenuation: 26 HU

Parenchymal phase attenuation: 106 HU

Delayed phase attenuation: 46 HU

Relative washout: 57 %

Absolute washout: 75 %

IMPRESSION:

A 2.9 cm left adrenal nodule demonstrates washout characteristics that are compatible with an adrenal adenoma, as detailed above. Of note, a portion of pheochromocytomas may demonstrate overlapping enhancement/washout characteristics with adrenal adenomas; correlate clinically and consider biochemical correlation, as appropriate.

Relative washout > 40% and
absolute washout > 60%
supports BENIGN



Adrenal Incidentaloma – functioning vs. non-functioning

- Lesions can secrete cortisol, aldosterone, catecholamines, sex hormones, or steroid precursors
 - 90% are nonfunctioning; **10-15% functioning**
 - Subclinical Cushing (6.4%); pheochromocytoma (3.1%); primary aldosteronism (0.6%)
- Evaluation should include a CPE aimed at identifying signs and symptoms of hormonal excess and/or potential malignancy risk
- **Who needs biochemical evaluation?**

Hx HTN controlled on lisinopril 20 mg/day.
CT abdomen 2.1 -2.9 cm left adrenal nodule (26HU)



Adrenal Incidentaloma – biochemical evaluation

Table 5. Functional work-up for adrenal incidentalomas

Hormone Excess	Population	Tests	Interpretation	Ancillary testing
Cortisol	All AIs	1 mg DST - 1 mg taken at 11PM, serum cortisol measured at 8AM	<50 nmol/L excludes cortisol hypersecretion 51-138 nmol/L possible autonomous cortisol secretion >138 nmol/L evidence of cortisol hypersecretion	ACTH independency should be confirmed in all patients considering intervention by measuring plasma ACTH. 24-hr urinary-free cortisol, midnight salivary cortisol. DHEAS
Aldosterone	Hypertension/ Hypokalemia	aldosterone/renin ratio	20 ng/dL per ng/mL/hr has excellent sensitivity and specificity (>90%) for confirming hyperaldosteronism (labs may have their own calibrated reference cut-offs).	Adrenal vein sampling for lateralization, Saline suppression and salt loading with 24-hr urine aldosterone measurement
Catecholamines	HU ≥10 or HU not available	Plasma free metanephrines 24-hour urinary fractionated metanephrines	>2X upper limit of normal	N/A
Androgens	Suspected ACC or virilization	DHEAS, testosterone	Higher levels suggest greater burden of disease	17β-estradiol, 17-OH progesterone, androstenedione, 17-OH pregnenolone, 11-deoxycorticosterone, progesterone, and estradiol.

Biochemical evaluation was NL

Hx HTN controlled on lisinopril 20 mg/day.
CT abdomen 2.1 -2.9 cm left adrenal nodule (26HU)



Adrenal Incidentaloma – management and follow-up

Function	Size	Management and Follow-Up
Benign non-functional	< 4 cm	< 10 HU – Do not require further imaging or hormonal f/u Others – additional imaging (washout CT, MRI, or repeat CT in 6-12 months)
	≥ 4cm	Repeat CT in 6-12 months
Benign functional	any size	Endocrine referral Surgical referral for possible adrenalectomy
Suspected malignancy	any size	Surgical referral for adrenalectomy Consider biopsy and PET/CT





Adrenal Case Assessment

- The 2.9 cm left adrenal mass is consistent with a benign, non-functioning adrenal adenoma
- No signs of hormonal hypersecretion or malignancy
 - Physical Exam and Hormonal evaluation was negative for cortisol excess, pheochromocytoma, and aldosterone excess
- Adrenal wash-out CT was consistent with adenoma, Repeat CT @ 12 months stable
- No immediate intervention needed, no further imaging or hormonal evaluation recommended
- Underwriting Assessment?

No excess mortality risk



Renal incidentaloma (40% prevalence on CT)

- Most are **benign cysts**
 - Ultrasound findings:
 - Round, sharply demarcated with smooth walls
 - No echoes within the cyst
 - Good transmission through the cyst with a posterior wall echo
 - CT with/without contrast
 - Sharply demarcated with smooth, thin wall
 - *No enhancement* with contrast
 - < 20 HU (same density as water)
- **Angiomyolipomas (benign)** can be diagnosed by imaging alone
 - macroscopic fat and no calcifications
 - low but ^ risk for hemorrhage as they grow, surveillance with CT or MRI
 - if bilateral, assess for tuberous sclerosis and add surveillance for RCC

Differential Dx

Benign

- Cyst
- Angiomyolipoma
- Oncocytoma

Malignant

- Renal cell carcinoma

Vascular

- AV fistula
- Renal artery aneurysm
- pseudoaneurysm



Bosniak Classification of Cystic Renal Masses, v. 2019

1986 – original classification system developed for CT

2019 – major revision to incorporate MRI

cystic renal mass has less than 25% enhancing components

Category	Bosniak 1986 (CT)	Bosniak 2019 (CT and MRI)	Wall Thickness	# Septa	Smooth enhancing septal thickening	Irregular enhancing wall/septal thickening	Enhancing nodule	Follow-Up
I	Simple cyst	Benign simple renal cyst	≤ 2mm	0	-	-	-	No
II	Minimally complicated cyst	Likely a benign renal mass	≤ 2mm	1-3	≤ 2mm	-	-	No
IIF	Minimally complicated, need f/u	Cystic renal mass	3mm	≥ 4	3 mm	≤ 3 mm	-	Reimage 6 mo, 12mo, then annually x 5 yrs
III	Indeterminate, need f/u	Intermediate risk of malignancy	≥ 4mm	-	≥ 4mm	≤ 4 mm	-	Urology consultation
IV	Presumed malignant	Presumed malignant	-	-	-	-	+	Urology consultation



Renal Solid Enhancing Mass – r/o RCC

- Lesions < 3 cm and stable over five years can be considered BENIGN

Size	Recommendation
< 1 cm solid enhancing mass	Surveillance Imaging (q 6-12 mo x 5 years) (malignant lesions of this size often indolent with low rates of mets)
1 to 4 cm solid enhancing mass	80% RCC, 20% benign Resection, thermal ablation, biopsy, active surveillance
> 4 cm solid enhancing mass	Presumed RCC, refer to Urology



Ovarian Incidentalomas

- Most are benign
 - Functional Cysts in premenopausal women
 - Cystadenoma in postmenopausal women
- Transvaginal US is the preferred imaging modality
- Risk Factors for Malignancy
 - Post-menopause with ^ CA-125
 - Complex cysts and masses
 - Thickened wall/septa, solid components with blood flow
 - Size > 3cm in premenopausal or > 1cm in postmenopausal

Society of Radiologists in Ultrasound

Premenopausal: physiologic cysts \leq 3 cm

Postmenopausal: simple cysts \leq 1 cm

NO f/u NEEDED

American College of Radiology

Benign-appearing cysts

Probably benign cysts



O-RADS™ v2022

Ultrasound

O-RADS Score	Risk Category
0	Incomplete evaluation
1	Normal Ovary
2	Almost Certainly Benign
3	Low Risk (1-<10%)
4	Intermediate Risk (10-<50%)
5	High Risk (>50%)

MRI

O-RADS Score	Risk Category
0	Incomplete evaluation
1	Normal Ovaries
2	Almost Certainly Benign (<0.5%)
3	Low Risk (~5%)
4	Intermediate Risk (~50%)
5	High Risk (~90%)

<https://www.acr.org/Clinical-Resources/Clinical-Tools-and-Reference/Reporting-and-Data-Systems/O-RADS>



O-RADS™ v2022 – Management

O-RADS Score	Risk Category	Pre-menopausal	Post-menopausal
0	Incomplete evaluation	Repeat US	Repeat US
1	Normal Ovary	No f/u	No f/u
2	Almost Certainly Benign		
	Simple Cysts	> 5 cm f/u US in 12 months	> 3 cm f/u US in 12 months
	Non-simple cysts	< 3 cm no f/u 3 to 10 cm f/u US 6 months	< 3 cm f/u 12 months 3-10 cm f/u 6 months
3	Low Risk (1-<10%)	Includes lesions > 10 cm; If not surgically excised, consider repeat US in 6 months or MRI with O-RADS score	
4	Intermediate Risk (10-<50%)	Refer to Gyne/Onc and/or MRI with O-RADS score	
5	High Risk (>50%)	Refer to Gyne/Onc	

<https://www.acr.org/Clinical-Resources/Clinical-Tools-and-Reference/Reporting-and-Data-Systems/O-RADS>



Ovarian Cancer Screening

- Ovarian cancer is the second most common type of female reproductive cancer
 - More deadly than cervical and uterine cancer combined
- **No screening guidelines** shown to reduce mortality in average risk women, so screening is NOT recommended for asymptomatic women
- Women with BRCA+, Lynch Syndrome, and/or strong FHx have increased risk
 - Transvaginal US +/- CA 125 (< 35 U/mL)

ACR Reporting and Data Systems (RADS)

	Pathologic Condition	Score or Category	Score Assignment	Modalities
BI-RADS	Breast cancer	0-6 (4A-C)	Patient based	Mammography, MRI, US
C-RADS	Colon cancer	Colonic findings (C0-4); extracolonic findings (E0-4)	Lesion based	CT colonography
CAD-RADS	Coronary artery disease	0-5, N	Patient based	CT angiography
LI-RADS	Liver cancer (HCC)	1-5, TIV, NC, M, TR	CT, MR, CEUS: lesion based; US: patient based	CT, MRI, CEUS, US
Lung-RADS	Lung cancer (screening)	0-4 (4A, B, X), S, C	Patient based	Low-dose CT
NI-RADS	Head and neck cancers (diagnostic system)	0-4 (2A, B)	Patient based	PET, CT, MRI
O-RADS	Ovarian-adnexal masses	NA	NA	US
PI-RADS	Prostate cancer	1-5	Lesion based	Multiparametric MRI
TI-RADS	Thyroid cancer (incidental lesions)	1-5	Lesion based	US



ACR RADS in-progress

- Soft Tissue RADS
- Brain Tumor RADS
- TBI-RADS (traumatic brain injury)
- PE-RADS (pulmonary embolism)
- VI-RADS (vesical imaging)
- KI-RADS (kidney masses)



Whole-Body MRIs – Screening benefit or more incidentalomas?

- One-hour scan for “prevention” and “early detection” without the radiation of CT scans or X-rays
- Direct to consumer marketing
- Digital health start-ups
- \$2499

Whole-body MRI screening of asymptomatic individuals

576 participants in Turkey
Mean age 48
33% with clinically relevant findings
11% treated
15 (2.6%) undiagnosed cancer
28 (4.8%) brain aneurysms
16 (3%) false negative rate (among which five had cancers)

ONCO-RADS

REVIEWS AND COMMENTARY • REVIEW

Radiology

Oncologically Relevant Findings Reporting and Data System (ONCO-RADS): Guidelines for the Acquisition, Interpretation, and Reporting of Whole-Body MRI for Cancer Screening

Giuseppe Petralia, MD • Dow-Mu Koh, MD • Raj Attariwala, MD, PhD • Joseph J. Busch, MD • Ros Eeles, MD • David Karow, MD, PhD • Gladys G. Lo, MD • Christina Messiou, MD • Evis Sala, MD, PhD • Hebert A. Vargas, MD • Fabio Zugni, MD • Anwar R. Padhani, MD

International multidisciplinary expert panel of radiologists and a geneticist

ONCO-RADS

- International multidisciplinary expert panel of radiologists and a geneticist
- Cancer screening with whole-body MRI in individuals with cancer predisposition syndromes
 - Li-Fraumeni Syndrome (LFS)
 - Hereditary paraganglioma and pheochromocytoma syndromes
 - Hereditary retinoblastoma
 - Neurofibromatosis
- Imaging protocol, reporting template

General population	Higher-risk population	Likelihood of cancer after WB-MRI	Management
ONCO-RADS category 1-2 /		LOW	No Follow-up
ONCO-RADS category 3 1-2		INTERMEDIATE	Active Follow-up ^{a,b}
ONCO-RADS category 4-5 3-4 5		HIGH	Further investigation ± Biopsy

^aGeneral population: clarification of findings
^bHigher-risk population: guidelines follow-up

Radiology 2021; 299:494–507 • <https://doi.org/10.1148/radiol.2021201740>



Applying ONCO-RADS to whole-body MRI cancer screening in a retrospective cohort of asymptomatic individuals

Yong-Sin Hu^{1,2,3†}, Chia-An Wu^{2,3,4†}, Dao-Chen Lin^{2,3,5}, Po-Wei Lin^{2,3}, Han-Jui Lee^{2,3}, Lo-Yi Lin^{2,3} and Chung-Jung Lin^{2,3*}

- 2064 asymptomatic individuals (2017-2022)
- Median age 55
- 43 (2.1%) ONCO-RADS category ≥ 4
- 24 (1.2%) confirmed cancer

General population	Higher-risk population	Likelihood of cancer after WB-MRI	Management
ONCO-RADS category 1-2 /		LOW	No Follow-up
ONCO-RADS category 3 / 1-2		INTERMEDIATE	Active Follow-up ^{a,b}
ONCO-RADS category 4-5 / 3-4 / 5		HIGH	Further investigation \pm Biopsy

^aGeneral population: clarification of findings
^bHigher-risk population: guidelines follow-up

Conclusions The ONCO-RADS categories for cancer risk stratification were validated and found to be positively correlated with cancer risk.



Summary Key Points

- Increasing incidence of incidentalomas due to widespread use of imaging in clinical practice
- MDs and Underwriters must be able to assess the clinical significance, appropriate evaluation, management, and ideal follow-up to fully assess the mortality and/or morbidity risk
- Many recommendations are based on **expert opinion** and extrapolation from observational studies and may change over time and/or vary between organizations



Questions?



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