Radiology Diagnostic Confidence in Oncology, an Oncologist's Perspective
James Geller, MD

1. Goals of surveillance imaging in oncology include:
   A. Early diagnosis of relapse
   B. Early diagnosis of secondary malignancies or other morbidities
   C. Facilitation of long-term cure
   D. All of the above

Correct Answer: D

2. Recommended Imaging surveillance for Wilms tumor, after completion of therapy, will soon include:
   A. Interval MRI or CT of abdomen and CT of chest
   B. No imaging is necessary
   C. Interval Abdominal ultrasound and chest xray
   D. Interval Abdominal ultrasound and CT chest

Correct Answer: C

Staging and Following Common Pediatric Malignancies – MRI vs. CT vs. Other Imaging Approaches?
Stephan Voss, MD, PhD

3. Which of the following statements regarding surveillance imaging is CORRECT?
   A. For most pediatric tumors routine surveillance imaging has NOT been shown to improve overall outcome as compared to relapse detected based on symptoms or serologic markers
   B. Surveillance imaging should be performed in all patients – finding disease earlier is better
   C. The sensitivity of surveillance imaging can be increased by adding PET/CT to the surveillance regimen
   D. The benefits of MRI, with no ionizing radiation, always outweigh the potential risks of sedation and anesthesia

Correct Answer: A

References:


4. Which statement is best describes the role of MRI in staging and response assessment for common pediatric solid tumors?
   A. MRI is the method of choice for ALL pediatric tumors, regardless of location or indication
   B. The choice of MRI vs CT should made by the clinician. They know their patients best.
   C. MRI can be either complementary to, or superior to, other imaging modalities when staging and assessing response to therapy
   D. Pulmonary metastatic disease is most effectively evaluated by MRI and should be used whenever possible instead of CT.
   
   **Correct Answer: C**

References:


**MRI Assessment of Therapy Response – What to Look For and How to Report**

*Ethan Smith, MD*

5. Based on RECIST 1.1 criteria, which of the following lesions would be an appropriate target lesion?
   A. T2 hyperintense liver lesion measuring 0.8 cm in maximum diameter
   B. Lymph node in the right hilum measuring 1.3 cm in short axis diameter
   C. Heterogeneously enhancing subcarinal mass measuring 2.5 cm in maximum diameter
   D. Focal hyperintense bone marrow lesion seen on STIR images
   E. Right kidney simple cyst measuring 3.2 cm in diameter

   **Correct Answer: C**

**Rationale:**

A. Incorrect – a target lesion must measure over 1 cm in diameter
B. Incorrect – lymph nodes, in order to be target lesions, must measure over 1.5 cm in short axis diameter
C. Correct – a target lesion must be over 1 cm in diameter
D. Incorrect – in order to be a target lesion, a bone lesion must have an identifiable soft tissue component
E. Incorrect – simple cysts cannot be included as target lesions because they are not a part of the malignant process

Reference:

6. Based on iRECIST criteria, a patient with which of the following lesion measurements would be considered iCPD?
   A. 1 cm → 3 cm
   B. 1 cm → 3 cm → 1 cm
   C. 1 cm → 3 cm → non-measurable
   D. 1 cm → 3 cm → 5 cm
   E. 0.1 cm → 0.3 cm → 0.5 cm

Correct Answer: D

Rationale:
A. Incorrect – only 1 post treatment assessment, so progression cannot be confirmed
B. Incorrect – progression not confirmed as the lesion shrinks on the second post-treatment assessment
C. Incorrect – non-measurable disease on a post-treatment scan is considered iCR (complete response)
D. Correct - progression is confirmed on the second post-treatment scan. iCPD (confirmed progression) requires a measurable lesion at baseline that meets RECIST criteria for progressive disease at post-treatment assessment (iUPD – unconfirmed progression), and then continues to progress on a second follow up assessment.
E. Incorrect – a lesion of 0.1 cm at baseline is not a valid target lesion by RECIST criteria

Reference:

Imaging of Neuroblastic Tumors, Including IDRFs
Alex Towbin, MD

7. Which of the following terms is defined as an organ that has no visible layer between tumor and neighboring structure?
   A. Separation
   B. Contact
Correct Answer: B

Rationale:
According to the INRG definitions contact is defined as: “Contact means that no visible layer is present between the tumor and the neighboring structure. For an artery, contact means that less than 50% of the vessel’s circumference is in contact with the tumor. In addition, the term flattened is used to describe veins with a reduced diameter that still have a partially visible lumen. When a tumor is in contact with a vital structure or is flattening a vein without encasement, an IDRF is not present, except in the case of renal vessels.”

Reference:

8. Which of the following describes a tumor that is IDRF-positive?
   A. A tumor that is flattening the inferior vena cava
   B. A tumor that distorts the left renal capsule
   C. A tumor that contacts the left renal vein
   D. A tumor that extends into the left-sided L5 neural foramina occupies approximately 1/5 of the spinal canal at that level.

Correct Answer: B

Rationale:
According to the INRG definitions, an IDRF is present when the tumor is in contact with the renal vessels. “In the Shamberger et al series (31), 15% of children treated for abdominal neuroblastoma required nephrectomies or had a renal infarction during surgery. Furthermore, the risk for nephrectomy in children who underwent tumor excision up front was twice that of those who underwent resection after chemotherapy. Therefore, even isolated contact with renal vessels is considered an IDRF-positive condition.”

The remaining tumors are not considered IDRF-positive.
“When a tumor is in contact with a vital structure or is flattening a vein without encasement, an IDRF is not present”
“For other vital structures (ie, neighboring organs), a contact may be associated with displacement—that is, an abnormal anatomic location—or distortion—that is, an abnormal anatomic shape—of the structure. However, these situations are not considered IDRFs unless there is infiltration or total encasement.”
“Posterior lumbar or sacral foraminal extensions are IDRF negative”

Reference:

Imaging of Cancer Predisposition Syndromes
Mary-Louise Greer, MD

9. Based on recent consensus guidelines issued by the American Association for Cancer Research, Whole Body MRI (WBMRI) is recommended in surveillance of which childhood cancer predisposition syndromes (CPS)?
   A. DICER1 syndrome, Rothmund-Thomson syndrome
   B. Li Fraumeni syndrome, neurofibromatosis type 1
   C. All cancer predisposition syndromes
   D. No cancer predisposition syndromes

Correct Answer: B

Rationale:
WBMRI is recommended as a baseline investigation in NF1 between 16 and 20 years to document disease extent and annually from diagnosis in LFS for early detection of asymptomatic lesions. [1,3] Option A, C and D are not correct. While WBMRI may have some utility in RTS and DICER1 syndromes, its use is considered optional rather than being routinely recommended. For example, in DICER1 syndrome other modalities may provide adequate screening without need for WBMRI e.g. abdominopelvic and thyroid ultrasound and chest CT/x-ray with a lower propensity for malignant neoplasms than in LFS. There are a large number of CPS where WBMRI is not warranted and others such as LFS where there is proven benefit in reducing mortality. [2,3]

References:
III. Villani A, Shore A, Wasserman JD et al. Biochemical and imaging surveillance in germline TP53 mutation carriers with Li-Fraumeni syndrome: 11 year follow-up of a

10. In Li Fraumeni syndrome, whole body MRI (WBMRI) detects what % of malignant lesions in patients undergoing surveillance?
   A. 80%
   B. 65%
   C. 30%
   D. 10%

Correct Answer: C

Rationale:
Almost 30% of malignancies are detected by WBMRI and while this is higher than for any other single element of the surveillance protocol, the overall improved outcome depends on a multimodality approach.

Reference:

Body Imaging of Tuberous Sclerosis and Von Hippel-Lindau Disease
Alex Towbin, MD

11. Which of the following tumors is associated with tuberous sclerosis?
   A. Pheochromocytoma
   B. PEComa
   C. Pituitary adenoma
   D. Paraspinal neuroblastoma

Correct Answer: B

Rationale:
Of the tumors listed, only PEComa is associated with tuberous sclerosis.

Reference:

12. Based on the diagnostic criteria, which of the following patients has a definite diagnosis of tuberous sclerosis?
A. A patient with lymphangioleiomyomatosis and renal angiomyolipomas
B. A patient with a Shagreen patch and a splenic hamartoma
C. A patient with a cardiac rhabdomyoma and renal angiomyolipomas
D. A patient with renal and hepatic angiomyolipomas

Correct Answer: C

Rationale:
According to the International Tuberous Sclerosis Complex Consensus Group, definite diagnosis requires two major features or one major feature with ≥2 minor features. However, a combination of the two major clinical features (LAM and angiomyolipomas) without other features does not meet criteria for a definite diagnosis. Major features include:

1. Hypomelanotic macules (≥3, at least 5-mm diameter)
2. Angiofibromas (≥3) or fibrous cephalic plaque
3. Ungual fibromas (≥2)
4. Shagreen patch
5. Multiple retinal hamartomas
6. Cortical dysplasias
7. Subependymal nodules
8. Subependymal giant cell astrocytoma
9. Cardiac rhabdomyoma
10. Lymphangioleiomyomatosis (LAM)
11. Angiomyolipomas (≥2)

Reference: