**Audit on ultrasound performance in soft tissue tumor assessment**

**Descriptor:**

Audit of ultrasound image quality in soft tissue tumor assessment.

**Background:**

Ultrasound is often used as the initial assessment for soft tissue tumor. It helps to confirm the presence and location of a mass, determine the nature and assess the likelihood of malignancy of the mass.1Good image quality is essential for lesion characterization and diagnosis. Since ultrasound is operator dependent, appropriate scanning technique is important to ensure optimal images and accurate diagnosis. Reproducibility and reliability during subsequent follow-up imaging depends on appropriate image quality and documentation. Optimization of ultrasound settings including frequency and focal zone adjustment are essential in minimizing artifacts and improve image quality. According to the Practice Parameter for the Performance of a Musculoskeletal Ultrasound Examination published by American Institute of Ultrasound in Medicine (AIUM) in conjunction with the American College of Radiology (ACR), the Society for Pediatric Radiology (SPR), and the Society of Radiologists in Ultrasound (SRU) in 2017, all soft tissue mass should be scanned in both long axis and short axis planes with 3 orthogonal dimensions measurement, and evaluated with colour or power doppler to delineate any internal vascularity.2  According to the literature recommendation, the ultrasound focus should be adjusted at the target of interest to optimize image quality and avoid potential artefacts.3-4

## The Cycle

**The standard:**

1. Soft tissue mass should be scanned in both long- and short-axis planes; and measured in 3 orthogonal dimensions.2
2. Soft tissue mass should be routinely assessed with colour doppler imaging to determine vascularity.2
3. Soft tissue mass should be assessed with appropriate focal zone ie. At the depth of lesion.3-4

**Target:**

100% of ultrasound scans should meet these standards.

## Assess local practice

**Indicators:**

The percentage of ultrasound scans that adhere to each of the standards.

**Data items to be collected:**

1. Clinical history and indications.

2. The mass should be scanned in both long- and short-axis planes.

2. The size of the masses measured in 3 orthogonal dimensions.

3. Any vascularity demonstated on Doppler ultrasound.

4. Depth and appropriateness of focal zone.

**Suggested number:**

Ultrasound scans with soft tissue masses should be collected and reviewed. All consecutive cases performed in 3 months interval, or 50 consecutive cases (whichever number is greater).

Inclusion criteria: Examinations with discrete mass

Exclusion criteria: Interventional procedures, diffuse pathology, lymphadenopathy, normal scan

**Suggestions for change if target not met:**

1. Education and promotion of the good practice among radiologist through departmental meetings.
2. Publicise the standards for soft tissue tumor ultrasound scanning technique through in-person departmental radiology meetings and dissemination of written material to radiologists and sonographers.
3. Discuss with radiologists and sonographers about the underlying contributing factors, and to identify measures for improvement.
4. Re-audit after the implementation of the recommended practice. Continue the audit spiral, to ensure sustained compliance with the standards.

**Resources:**

1. Radiology information system (RIS) to review reports and clinical information.

2. Picture archiving computer system (PACS) to review ultrasound images.

3. Statistical computer software, such as Microsoft Excel, for recording and analysing data.

[**musculoskeletal\_soft\_tissue\_mass\_usg\_technique.pdf**](https://www.rcr.ac.uk/sites/default/files/audit_template/musculoskeletal_soft_tissue_mass_usg_technique.pdf)PDF - 832.32 KB

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2. American Institute of Ultrasound in Medicine (AIUM) Practice Parameters: AIUM practice parameter for the performance of a musculoskeletal ultrasound examination 2017.

3. Carra BJ, Bui-Mansfield LT, O'Brien SD, Chen DC. Sonography of musculoskeletal soft-tissue masses: techniques, pearls, and pitfalls. AJR Am J Roentgenol. 2014 Jun;202(6):1281-90.

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