The role of training level and diurnal rhythms in ultrasonography accuracy for acute appendicitis in childr

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Background

Acute appendicitis is a common pediatric surgical emergency.
Ultrasound (US) is preferred to avoid CT radiation.
Its diagnostic accuracy may vary with **operator experience** and **day vs. night imaging**.
To determine whether:
The **training level** of the US operator
The **timing** of the exam (day vs. night)
affect diagnostic performance in children with appendicitis.

Methods

Retrospective cross-sectional study
326 pediatric appendectomy cases (Mar 2021–Sep 2022)
US performed by:

- Attending radiologists (22.4%)
- Radiology residents (52.5%)
- Non-academic radiologists (25.2%)

US vs. pathology results compared
Metrics: **Sensitivity, Specificity, PPV, NPV**

KeyResults

Attending radiologists had the highest ability to rule out disease (specificity, NPV)
Non-academic radiologists detected more true cases (sensitivity)

Diagnostic Metric	Attending	Resident	Non-Academic
Sensitivity	84.6%	81.8%	**87.8%**
Specificity	**57.1%**	36.3%	31.2%
PPV	83.0%	78.7%	**84.0%**
NPV	**60.0%**	41.0%	38.4%

Day vs. Night Performance

Night-time scans → fewer false positives, slightly better rule-out ability
(with night time sensitivity 84.7%,and 43.4% specifity the NPV 49.1%

Conclusion

US overall shows **good sensitivity** but **low specificity** for appendicitis in children.
Operator experience **trends** exist but are **not statistically significant**.
Night shifts demonstrate slightly better diagnostic balance.
US remains a reliable first-line tool but:
➜ Adjuncts (clinical scoring, labs, possibly CT) improve accuracy
➜ Ongoing operator training is essential