AI IN PEDIATRIC RADIOLOGY: SPECIAL CONSIDERATIONS, ETHICS, AND EXPLAINABILITY

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DECLARATION OF CONFLICTS OF INTEREST

The speaker is a significant stockholder in the following companies:

- **Alzeca Inc.**
- **Sensulin LLC.**
- Abbott Laboratories Inc.
  - Abbvie Inc.
  - Nektar Inc.
SPECIAL CONSIDERATIONS

- **Children are NOT**...
  - **Adults**
  - **Like Adults**
  - **Small Adults**

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**Second Opinion Interpretations by Specialty Radiologists at a Pediatric Hospital: Rate of Disagreement and Clinical Implications**

**Conclusion** A high incidence of radiologic interpretation errors may occur in pediatric trauma patients at risk for abusive head trauma who are referred from a community hospital. This suggests value for second interpretations of head CTs at a tertiary pediatric hospital for this patient population.

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Translational Imaging Group: TIGr
ETHICS: CHILDREN ARE: VULNERABLE NON-ACCIDENTAL TRAUMA

NO MARGIN FOR ERROR

False Positive: CPS takes child away from caring family
False Negative: Child is exposed to further danger
EXPLAINABILITY IS CRITICAL:
OPEN GROWTH PLATES VS. FRACTURES

False Negative

False Positive

A

B

C

D

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Definition
Explainability is the extent to which the internal mechanics of a deep learning system can be explained in human terms.

Current State-of-the-art
- Post-hoc Explanations
  - Explaining pre-trained models
  - LIME (Local Interpretable and Model-Agnostic Explanations)
  - SHAP (Shapely Additive exPlanations)
  - LRP (Layer-wise Relevance Propagation)

Knowledge Gaps
- User-focused Explanations
- Concept-based explanations

Can be fooled. For example, See arXiv:1911.02508 [cs.LG]