

## **Contrast-Enhanced US In Paediatrics: Practical Application And Challenges**

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In pediatrics ultrasound has long been viewed more favorably than imaging that exposes patients to radiation and iodinated contrast or requires sedation. It is child-friendly and diagnostic capabilities have been improved with the advent of contrast-enhanced ultrasound (CEUS). Off-label use of drug is of the utmost importance in paediatrics because many drugs have not been evaluated in randomized trials in children. This is true for CEUS and the application of CEUS is promising. The contrast agent SonoVue<sup>®</sup> (Bracco Imaging, Milan, Italy) has recently been approved by the FDA to be used in hepatic investigations in adults and children, and for use in ultrasonography of the urinary tract (voiding ultrasonography) for the evaluation of suspected or known vesicoureteral reflux (VUR). In addition to these approved indications, CEUS is safe and effective for the examination of many organs, as recently highlighted by the European Federation of Societies for Ultrasound in Medicine and Biology (EFSUMB). The usual indications of CEUS are parenchymal injuries in blunt abdominal trauma, focal liver lesions, solid tumours and voiding cystogram.

The challenge of off-label use of CEUS in paediatric patients is balancing between the need to deal with unresolved legal issues with the need for high diagnostic performance in daily clinical routine. The other challenges are the lack of procedure standardization, and no approved official written recommendation of the dose for different intravenous application related to the child's weight.

The aim of this lecture is to present basic knowledge about the use, the findings and the limitations of contrast-enhanced ultrasound (CEUS), and the role of off-label use of US contrast agents in paediatric patients. Tips and tricks about "how to perform the exam" in some cases will be presented. In conclusion, when restrictions are respected, CEUS holds promising perspectives and may help reduce radiation exposure and use of iodinated contrast agents in pediatrics, thereby potentially reducing complications in routine imaging.