

consecutive ML followed by subsequent successful lengthening; 2/22 (9%) had at least 1 ML and did not have subsequent successful lengthening.

**Conclusion:** 18% of EOS patients treated with MCGR had minimal lengthening episodes resulting in < 1mm of distraction; of those patients that attempted further lengthening, 91% successfully lengthened on subsequent attempts.

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### Paper #23

#### Optimization of a MCGR US-Guided Lengthening Clinic

Judson Karlen, Monique Riemann



**Summary:** MCGR adjustment is performed in dedicated clinics in our institution. We, in close coordination with our radiology department, restructured the lengthening clinic to increase efficiency. We changed our primary imaging to US to decrease radiation exposure, moved the clinic to the ultrasound suite in radiology, and utilized 2 sonographers/rooms at a time. US was fast and accurate. Radiation exposure decreased 83% and patient wait times decreased 64%. Patients and providers were very satisfied with the change.

**Hypothesis:** Changing from XR to US measurement of MCGR lengthening would improve patient safety without sacrificing quality or satisfaction.

**Introduction:** MCGR lengthening is safe, fast, and well-tolerated by the patients. However, imaging is needed to confirm the actual movement. This was originally done with before-and-after radiographs at our institution, which combined with more frequent adjustments, raised obvious

concerns about radiation exposure. Presented results using ultrasound(US) instead of radiography(XR) for this indication provided an opportunity improve the quality and safety of our patient care.

**Methods:** We engaged our radiology colleagues to set up a dedicated clinic. Once the accuracy of the ultrasound was verified, efforts were made to improve the clinic. In return for moving the clinic to the Radiology Department they were willing to provide 2 US suites and techs.

**Results:** Average radiation exposure decreased 83%, from 43.7 mSv to 7.3 mSv.

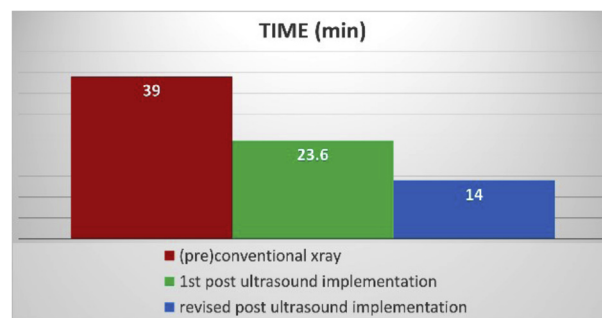
Average patient wait time decreased 64%, from 39 min to 14 min. Treatment time has decreased as well, so the scheduled time slot for each patient has decreased from 30 minutes to 15 minutes (50%).

Patient and parent satisfaction were excellent.

**Conclusion:** Changing from XR to US has improved patient safety by decreasing radiation exposure 83%.

Patient wait times and satisfaction have improved. Efficiency for providers improved remarkably as well, cutting in half the time needed to run the clinic.

We are well aware that some of the results are institution-specific, and that some of the improvement in efficiency is simply a learning curve. However, we do submit that this is an example of how coordinated efforts can lead to improved patient care and safety.



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### Paper #24

#### Changes of Vertebral and Disk Morphology Following Treatment with MCGR

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**Summary:** Significant changes of morphology of lumbar vertebra and disks are observed under distraction with MCGR compared to segments below instrumentation and to the control group. The rigidity of the thorax seems to protect the thoracic vertebra from overgrowth and seems to protect the disk spaces from significant loss of height.

**Hypothesis:** Continuous distraction by MCGR in the treatment of EOS leads to changes of disk and vertebral morphology.

**Introduction:** Reports in the literature suggests that changes in vertebral morphology may occur after treatment with TGR or VEPTR. However, there are no such reports following treatment with MCGR. This study was undertaken to analyze changes of morphology of disks and thoracic and lumbar vertebrae following treatment with MCGR.

**Methods:** 30 patients, 21 girls and 9 boys, who were treated with MCGR for EOS were included in the study and compared to a matched control group of 19 patients (12 girls and 7 boys) which was treated by observation or bracing. Age at surgery was 8+9 (4+7-11) years compared to an onset of treatment at age 7+9 (3+6-10+4) years in the control group. Mean f/u was 45 months (24-65 months) in the surgery group vs 42 months (24-65 months) in the control group.

Calibrated x-rays were used to digitally measure vertebral and disk height as well as vertebral body depth and width immediately after the index surgery