

Comparison of Newly Implanted versus Converted Magnetically Controlled Growing Rods (MCGR) from the Post-United States Release

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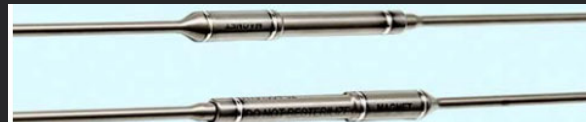
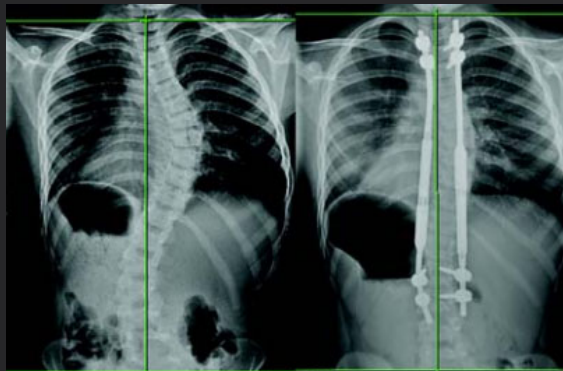
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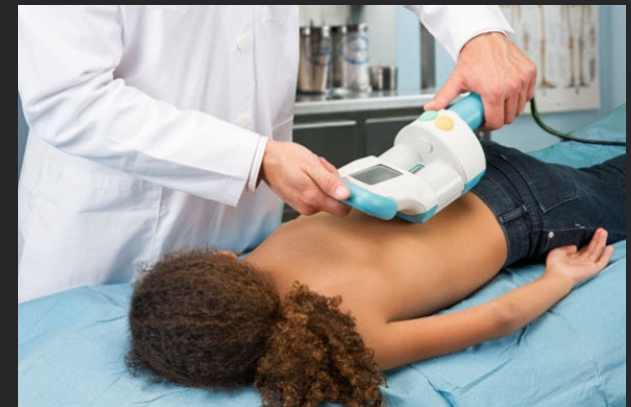
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Background

- Magnetically Controlled Growing Rods (MCGR)
 - Treatment for correcting early onset scoliosis (EOS)
 - Obviates need for invasive procedures for lengthening
 - Recent evidence shows cost neutrality between MCGR and traditional growth rods is achieved within 6 years (Polly Jr et al, ClinicoEconomics and Outcomes Research 2016)



Thompson et al, Bone and Joint 2016



Purpose

While MCGR appears beneficial for EOS, it is still unclear if patients with traditional growth instrumentation will benefit from conversion to MCGR.

Hypothesis: For EOS patients, greater curve correction will result for new MCGR implants, while higher complications will be observed for conversions at 1 year follow-up after index surgery.

Study Design

Design – Retrospective cohort study involving 5 sites from the Children's Spine Study Group

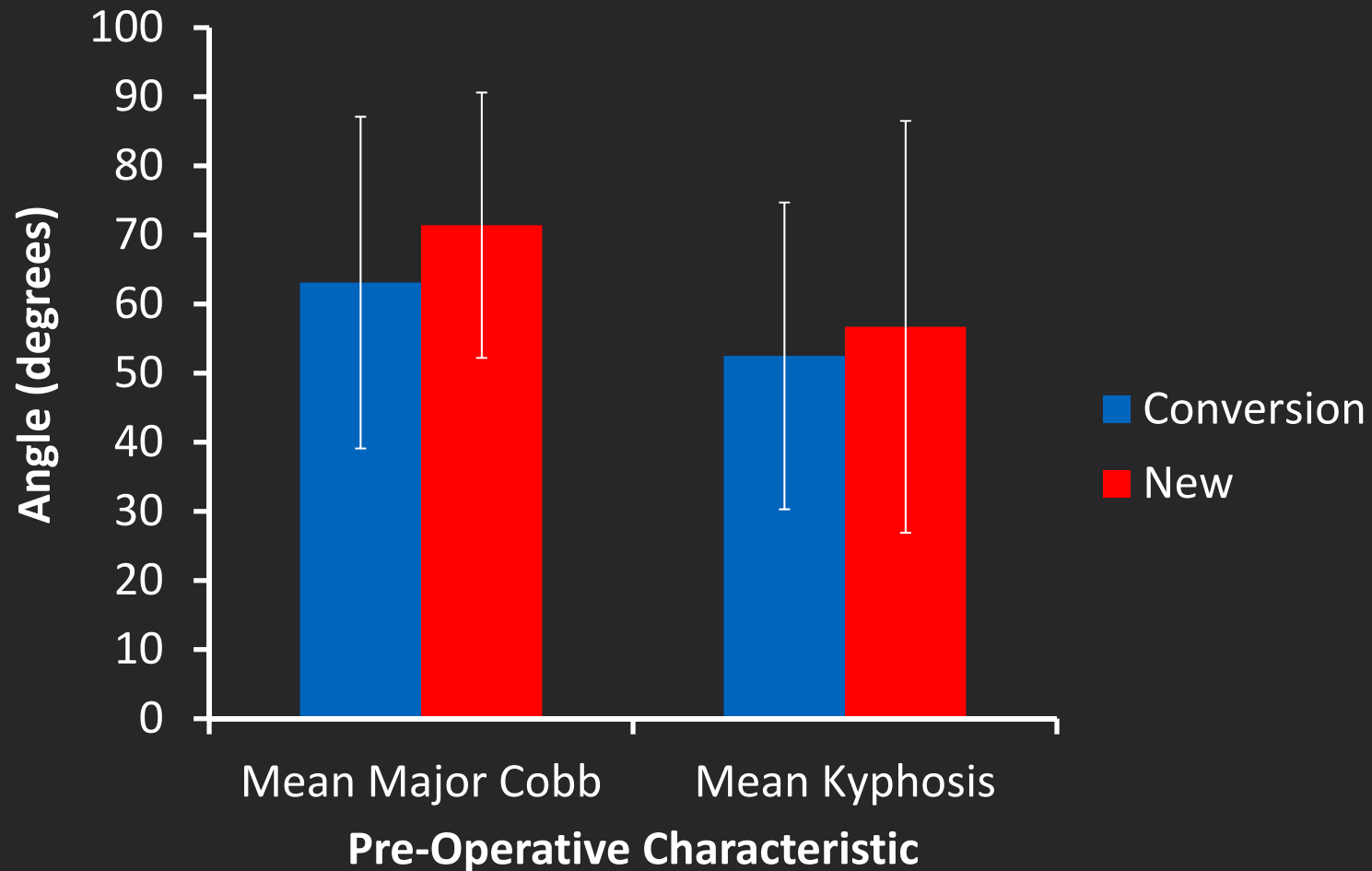
Inclusion Criteria

- MCGR Implant for EOS
- Follow-up minimum of 1 year after index surgery

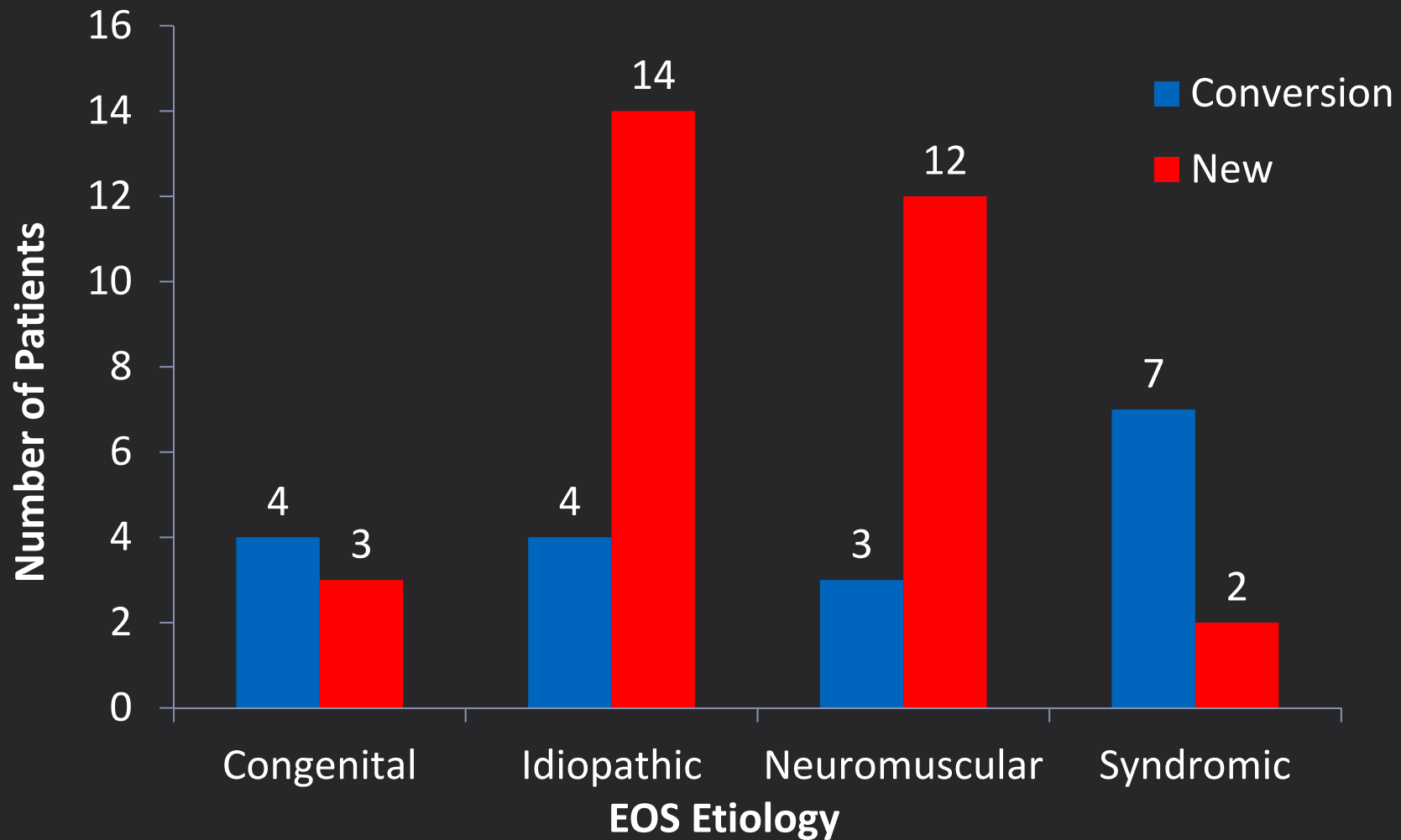
Patient demographics are similar between groups except for gender

| | New | Conversion | Total | p |
|-------------|-----------|------------|-----------|----------|
| Female | 14 | 14 | 28 | p = 0.03 |
| Male | 17 | 4 | 21 | |
| | | | | |
| Age (y) | 8.1 ± 2.3 | 7.6 ± 2.7 | 7.8 ± 2.5 | p = 0.53 |
| Weight (kg) | 22.4 | 24.8 | 24 | p = 0.46 |
| Height (cm) | 114.3 | 121 | 119 | p = 0.34 |
| BMI | 17.1 | 16.3 | 16.5 | p = 0.38 |

No significant differences in pre-operative spinal deformity between groups



The most common etiologies were Idiopathic and Neuromuscular

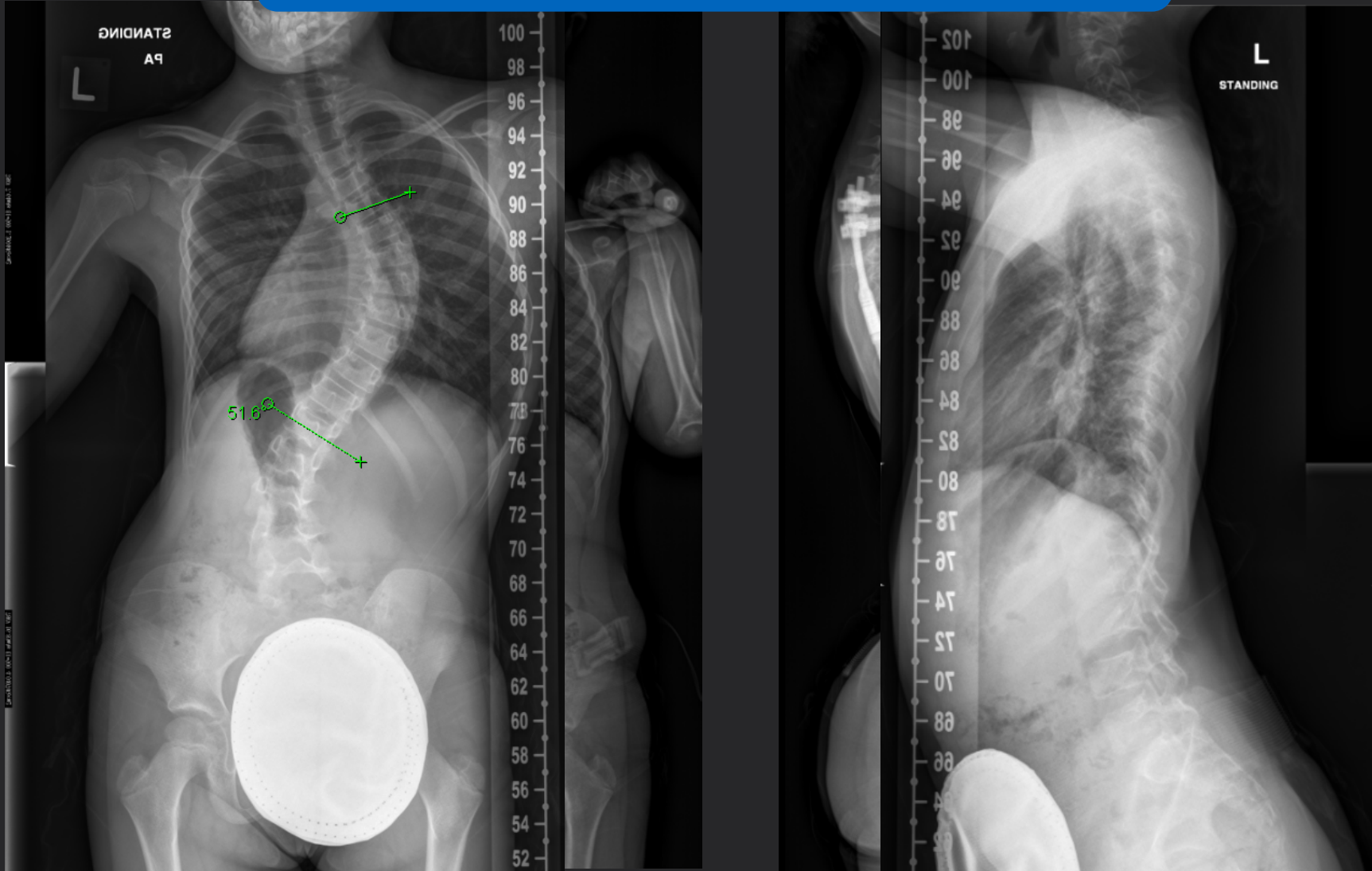


No significant differences in number of MCGR lengthenings between groups

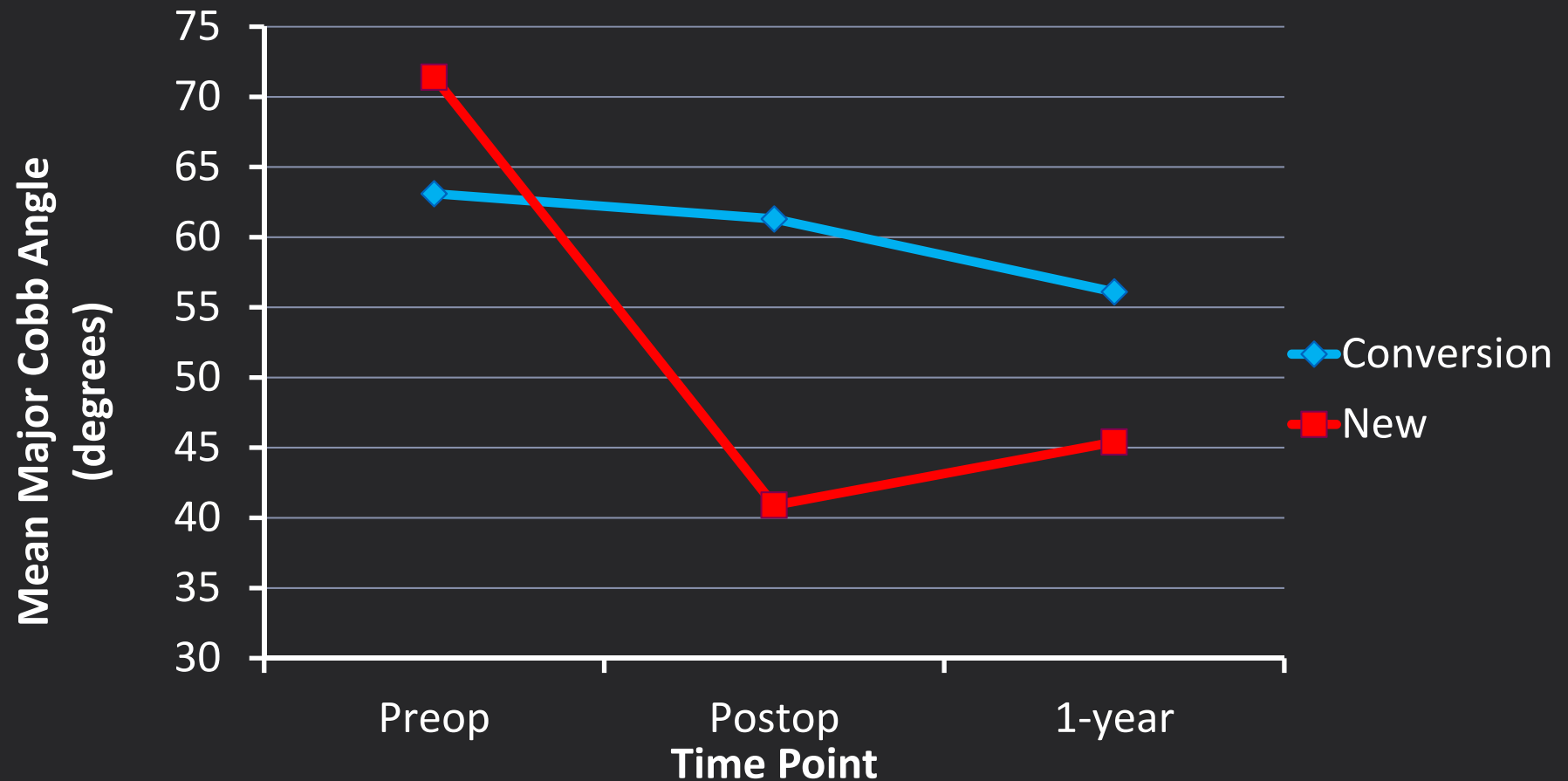
| | Average # of lengthening per year | Average interval between lengthening (weeks) |
|------------|-----------------------------------|--|
| Conversion | 3.8* | 17.5 |
| New | 3.6* | 17.4 |
| All | 3.7 | 17.5 |

*P = 0.73 (comparing conversion to new)

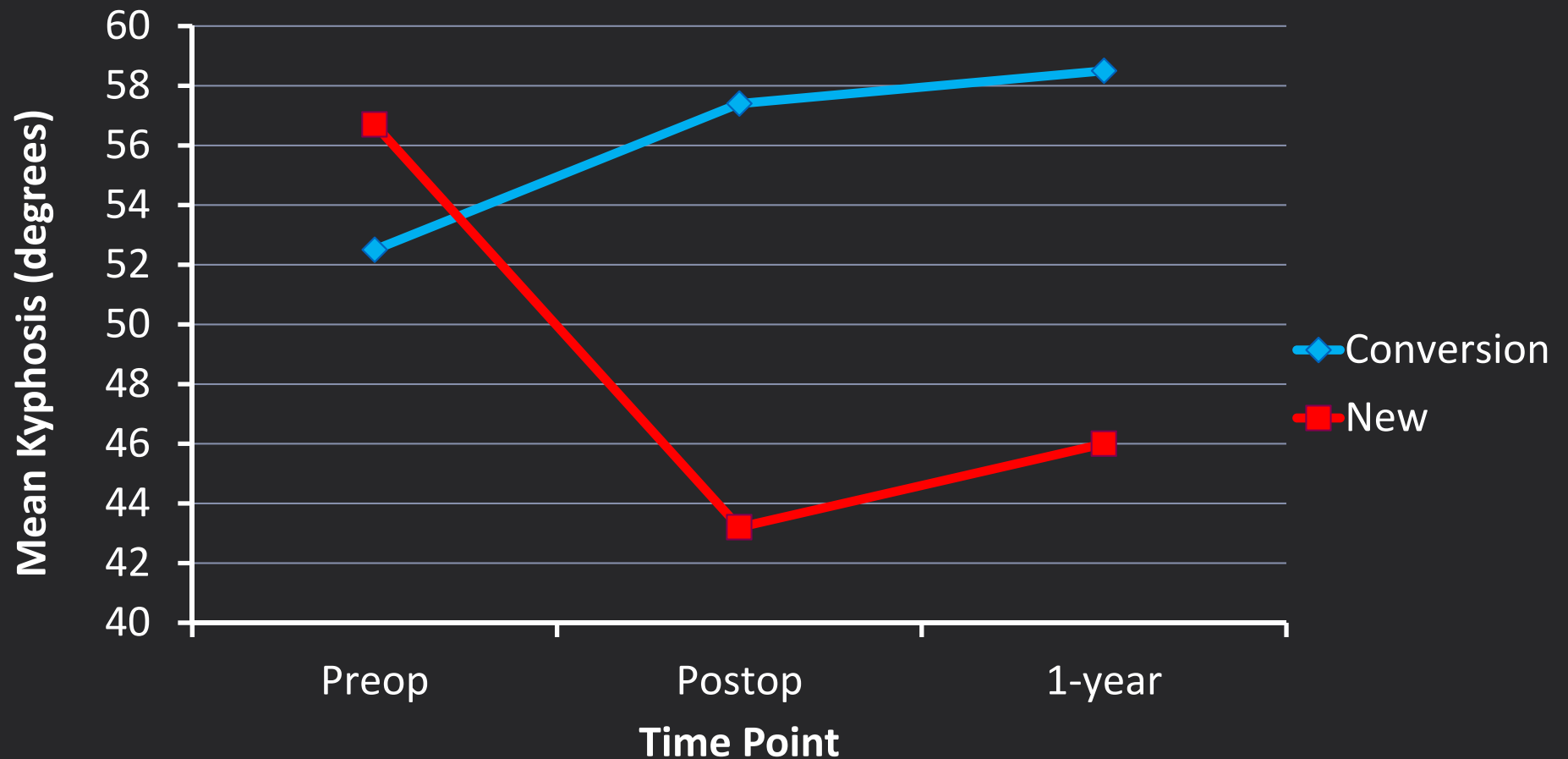
Post – MCGR Implantation



New implants experience significant major Cobb angle correction postoperatively; conversions maintain Cobb angle correction



New implants experience significant kyphosis correction postoperatively



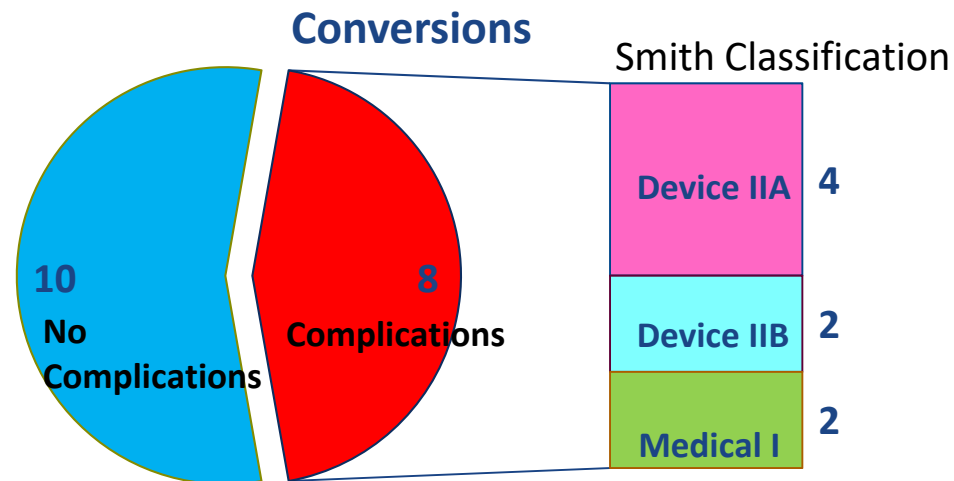
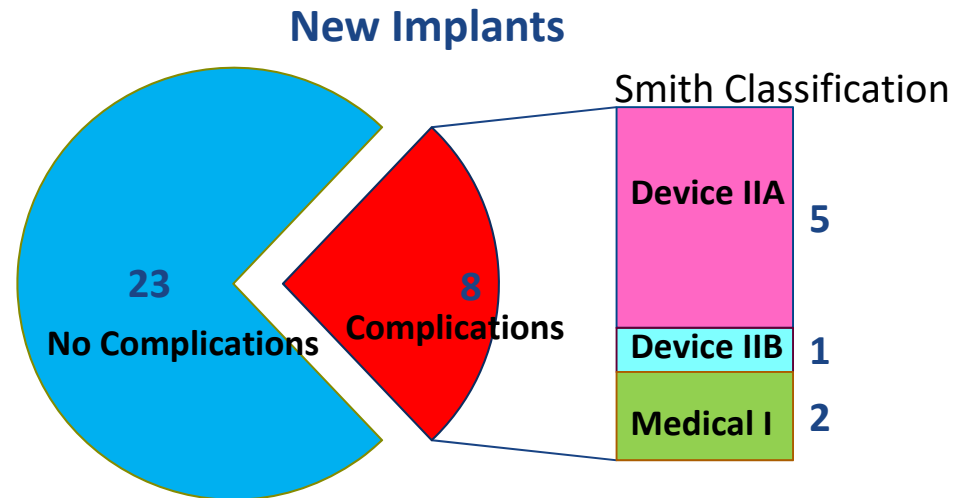
Higher complication risk for conversion patients trended towards significance

- 16 unique patients with complications
- 24 total reported incidences of complications

| Complications by Patient | Number | Risk |
|--------------------------|--------|------|
| New | 8/31* | 0.26 |
| Conversion | 8/18* | 0.44 |
| Total | 16/49 | 0.33 |

*P = 0.18

Despite higher complication risk for conversion, the severity of complications are similar.



Conclusions

- New implants achieved significant major Cobb and kyphosis angle correction, while conversions did not.
- Conversions were successful in maintaining curve correction.
- Conversions experienced higher risk of complications but severity was similar.
- Although conversions to MCGR experienced higher risk of complications, treatment goals were achieved by minimizing need for repeat lengthening surgeries and by maintaining curve correction.

Thank You



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