

# Current Use in Growth-Friendly Implants: A Ten-Year Update

Walter Klyce, S Mitchell, J Pawelek, D Skaggs, J Sanders, S Shah, R McCarthy, S Luhman, B Akbarnia, **P Sponseller**, GSSG, CSSG

# Introduction

- Study of growth-friendly implants JPO 2010, on data from 1994-2007
- Little published on treatment trends since MCGRs in the U.S.
- Sought to characterize current practices
  - age at first surgery
  - construct type
  - Diagnosis
  - Cobb angle
  - lengthening intervals

# Hypotheses

- 1 – Age at first surgery increased 2007-2017  
recognizing importance of auto-fusion
- 2 – Lengthening intervals have increased  
to minimize burden
- 3 – C-EOS distribution categories have changed  
with CP and MM representing decreasing percents of all  
diagnoses

# Methods

- GSSG & CSSG databases studied 2007-17
- Constructs studied as either TGR, MCGR, VEPTR, or growth guidance
- Diagnoses categorized using C-EOS

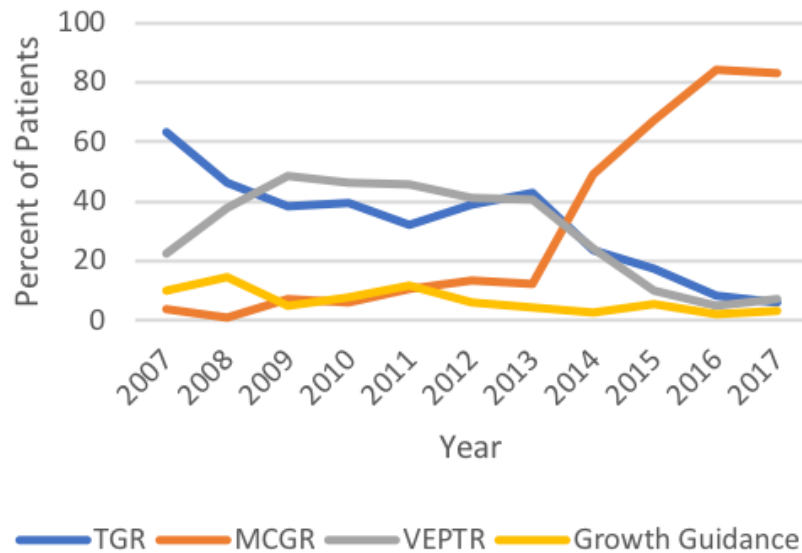
# Methods

- Data available for 1339 undergoing index surgery
- Lengthening intervals available for 614 patients
- Definitive treatment data available for 182 patients

# Results

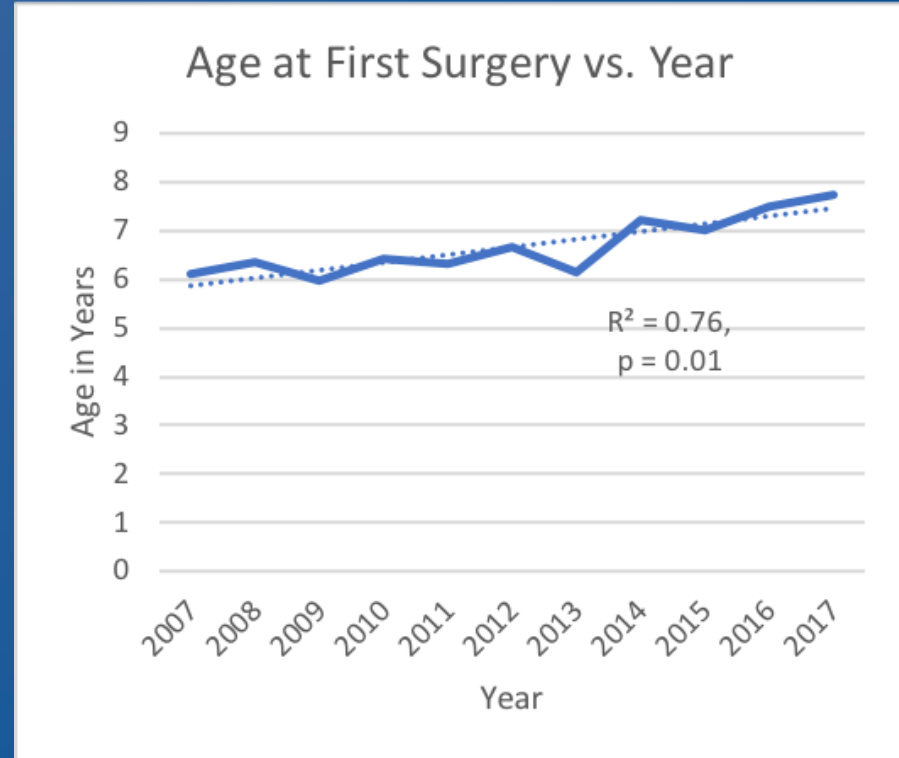
- MCGRs comprise > 80% of implants by 2016
- All other implants types down to < 10% each by 2016
  - Growth Guidance least at all times

Percent of Patients Receiving Implant Type vs Year, 2007-2017



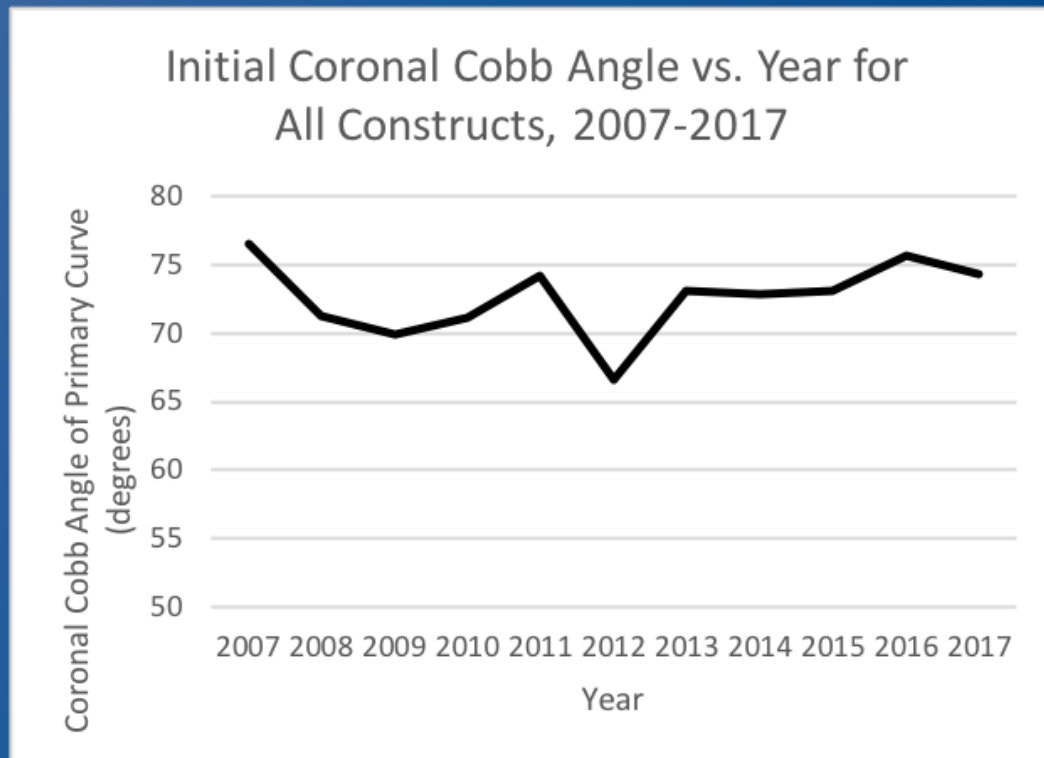
# Results

- Steady increase in age at first surgery, from mean = 6.1 yrs in 2007 to mean = 7.7 yrs in 2017



# Results

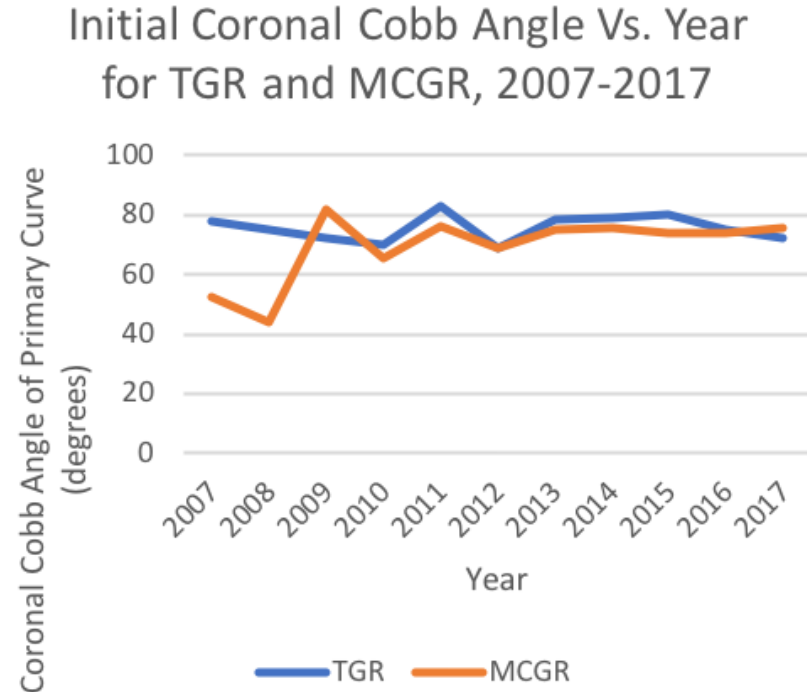
- Preop Curve:
- Relatively stable, mean = 75°





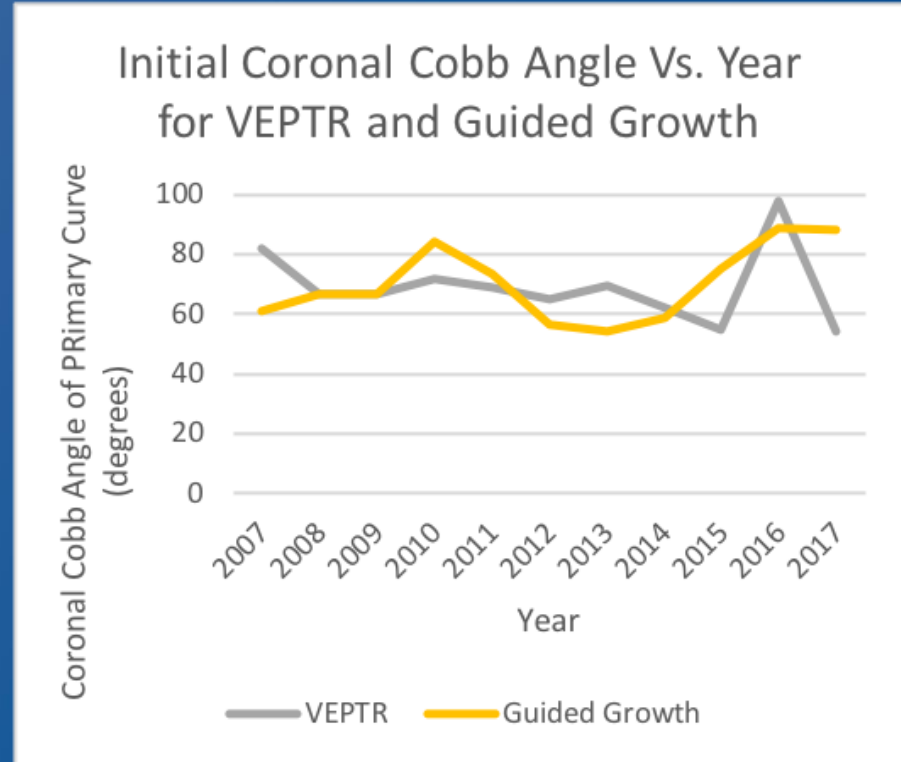
# Results

MCGR preop  
Cobb angles stabilized  
at similar magnitudes to  
TGR



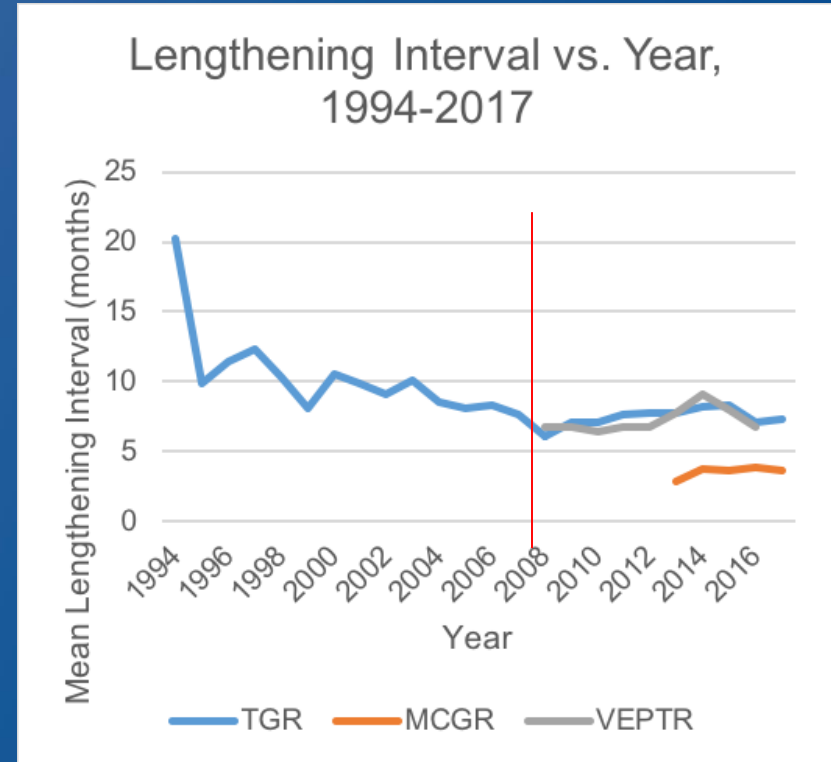
# Results

- More variation in curve sizes for VEPTR and guided growth



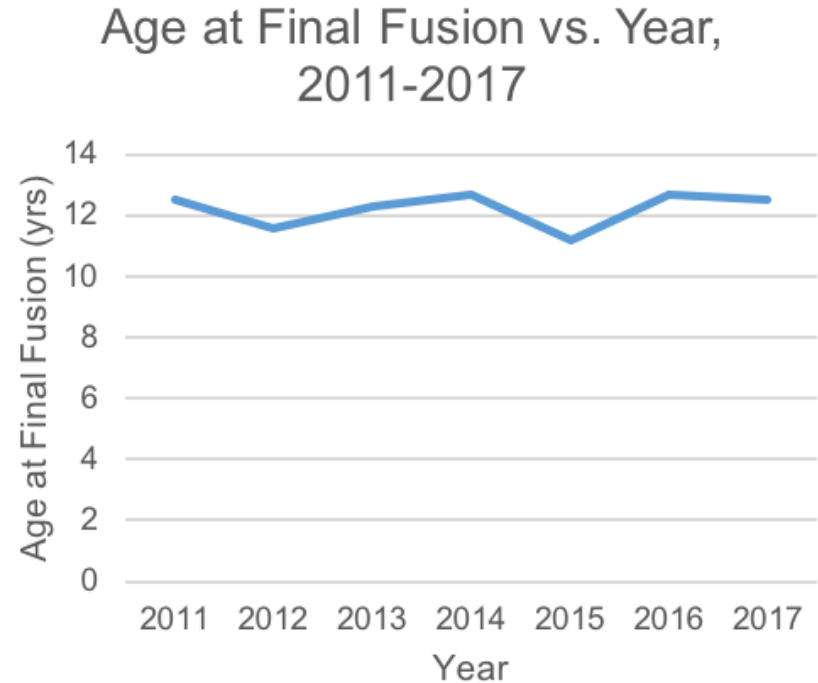
# Results

- Lengthening intervals available for 614 pts and compared to prior study
- TGRs and VEPTRs stable at 6-9 months since 2008
- MCGRs stable at 3-4 months



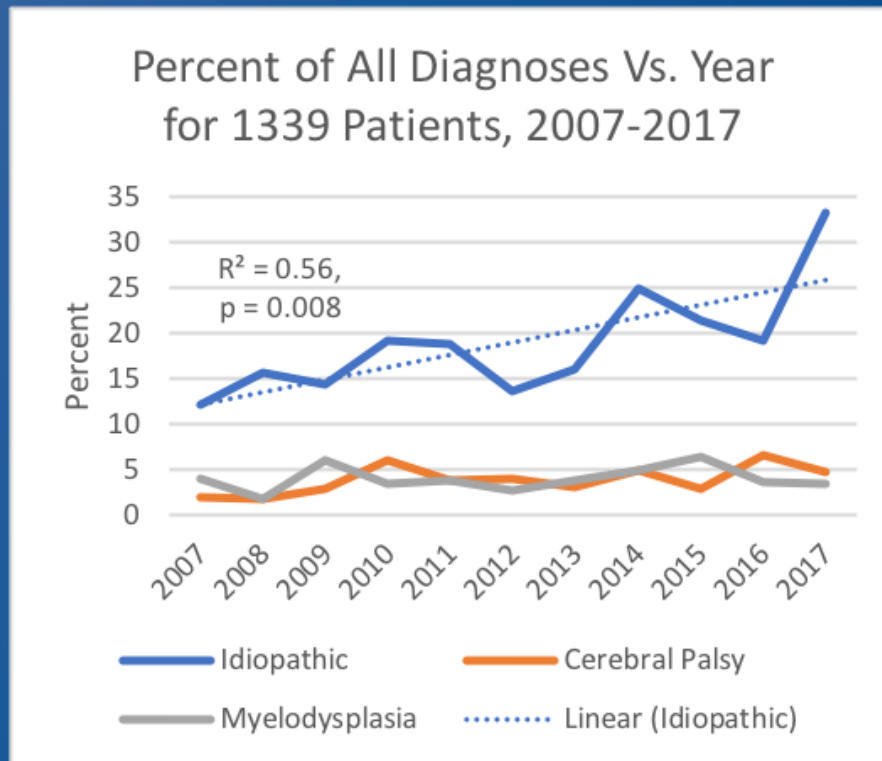
# Results

- Definitive treatment for 182 pts, of whom 159 (87%) had final fusions
- Mean age at final fusion stable at = **12.3 yrs**



# Results

- % idiopathic has increased steadily
- % CP and MM stable 2-7%



# Conclusions

- Treatment in EOS has largely shifted toward MCGR
- Mean age at first surgery has increased from 6.1 to 7.7yrs
- Final fusions are performed in ~87% of patients at a mean age of 12.3 yrs
- Percent idiopathic has increased, but percent myelo and CP have not changed and remain low

# Thanks



# Acknowledgements

With thanks to additional contributors from the Complex Spine Study Group (CSSG) for the recent addition of their patients, which improved and changed several conclusions in our study



# Disclosures

- As stated in program

# Results

## Preoperative demographics of 1339 pts undergoing initial growth-friendly instrumentation from 2007-2017

	TGR (n=397)	MCGR (n=371)	VEPTR (n=489)	Guided Growth (n=85)	p-value (ANOVA)
<b>Age (yrs)</b>	6.7 ± 2.6	7.7 ± 2.5	5.9 ± 2.9	7.4 ± 2.7	<0.001
<b>Primary Curve (degs)</b>	75 ± 22	74 ± 20	68 ± 24	69 ± 19	<0.001
<b>N (%)</b>					
<b>Female</b>	230 (58)	206 (56)	255 (52)	48 (56)	0.37
<b>Etiology</b>					
Congenital	98 (25)	44 (12)	172 (35)	13 (15)	<0.001
Neuromusc	72 (18)	102 (28)	58 (12)	25 (30)	<0.001
Syndromic	95 (24)	73 (20)	66 (14)	17 (20)	<0.001
Idiopathic	132 (33)	149 (40)	190 (39)	29 (35)	0.27

# Results

- >100 MCGRs placed in 2015 and 2016
- Decrease seen from 2016-2017 likely because data was not back from all sites at time of database queries

