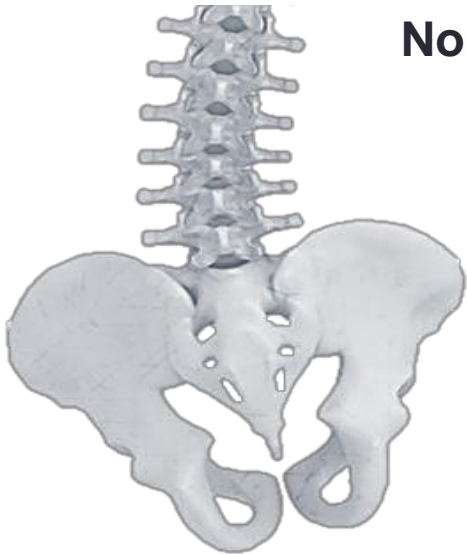


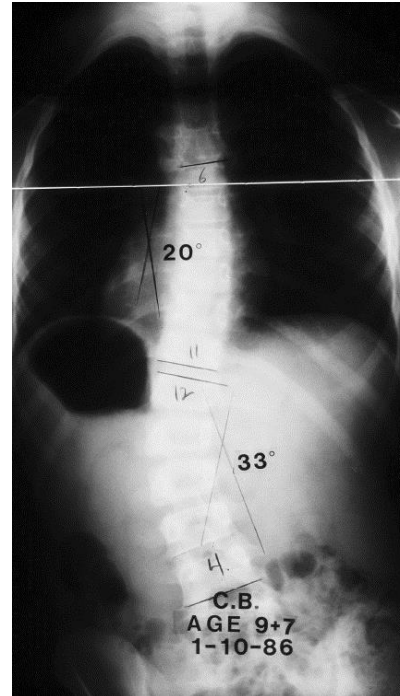


# The Original Bending Brace

**Non-Surgical, Nighttime, Scoliosis Management**



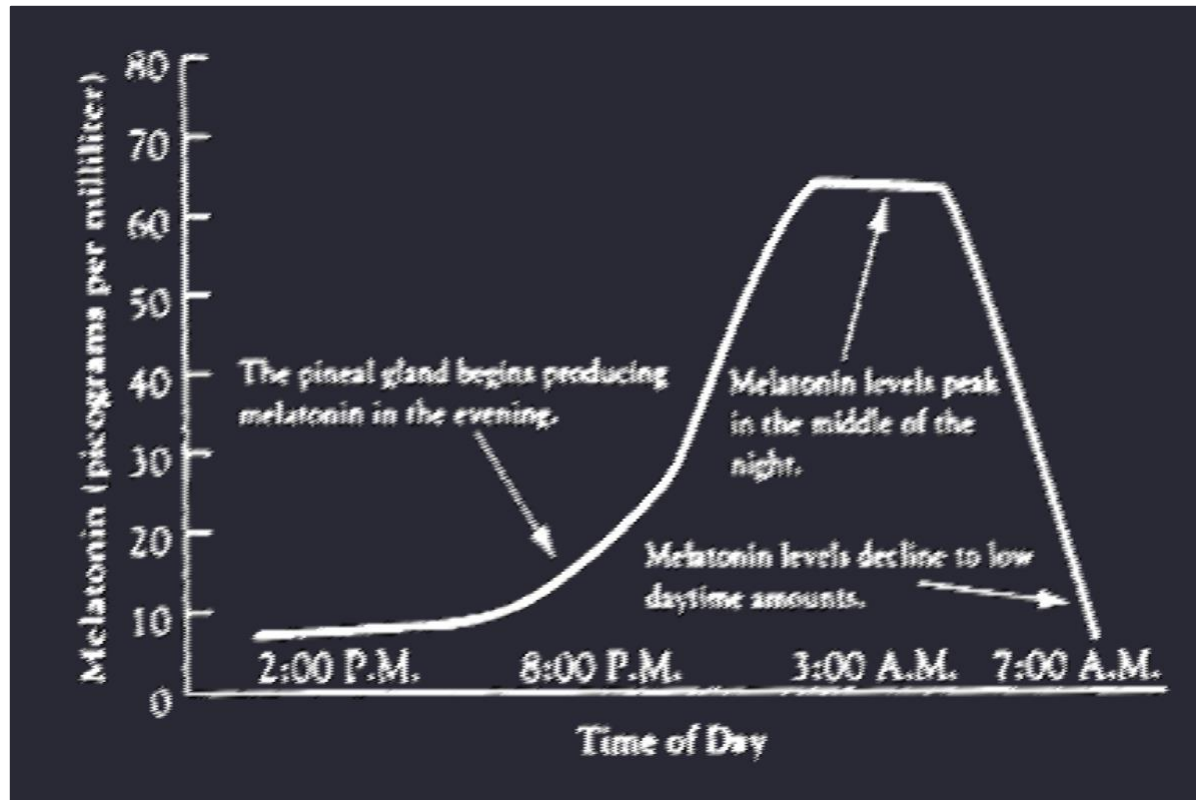
# Bending Brace: GROWTH MODULATION



# Gravity vs. Growth

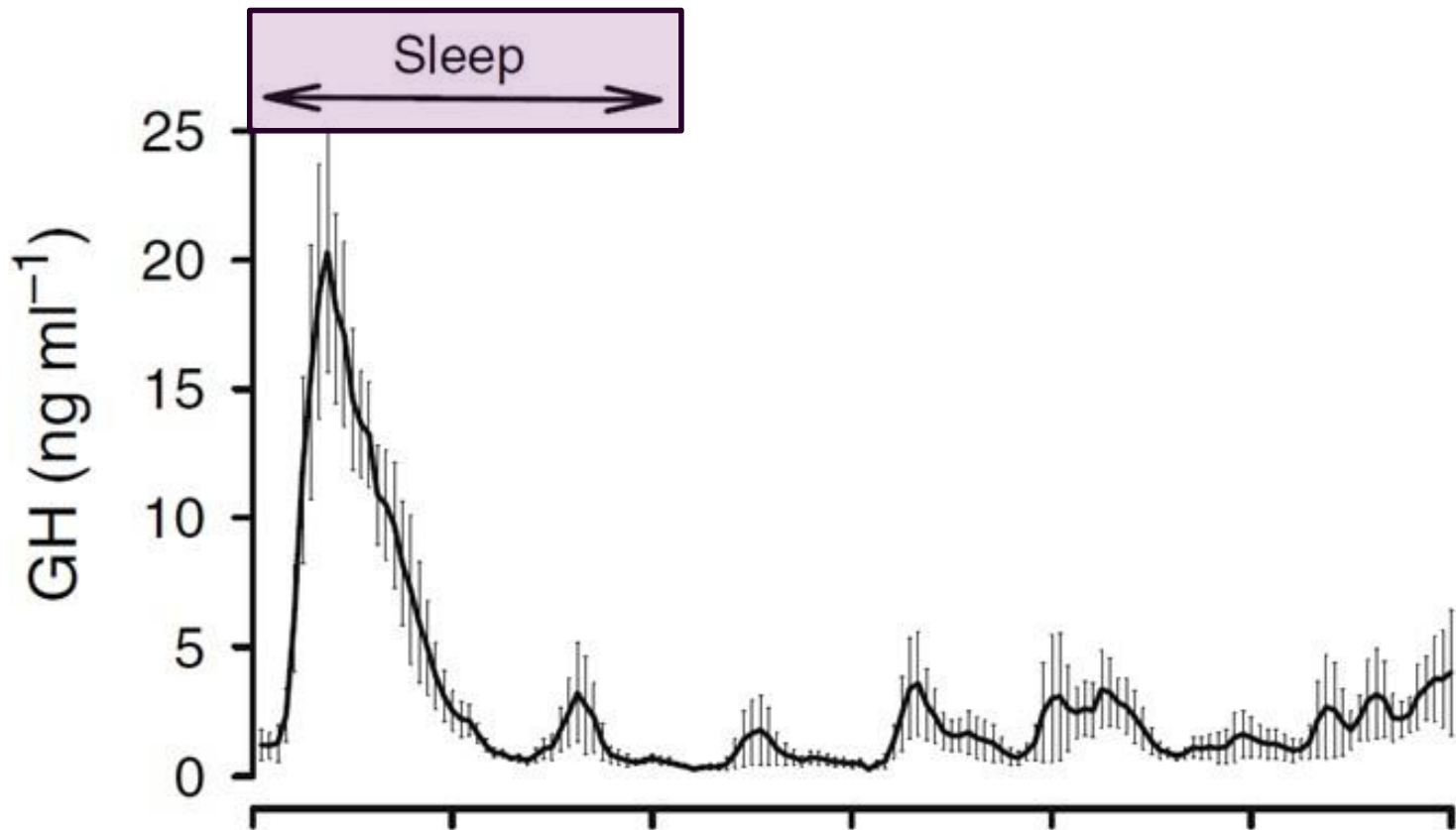
- **IF** scoliosis is a disorder of **GRAVITY** then **daytime** support is necessary.
- **IF** scoliosis is a disorder of **GROWTH** then **nighttime** bracing may be all that's required.

# Melatonin



- Levels are high at **night** - minimal levels during the day
- Levels are low in patients with progressive AIS

# Growth Hormone is only present and active at night



Brandenberger G, "The 24-h growth hormone rhythm", J Sleep Res. 2004 Sep;13(3):251-5.

# Tibial growth in lambs

“...at least 90% of **bone elongation occurs during recumbency** and almost no growth occurs during standing or locomotion. The authors hypothesize that growth may also occur in children during rest or sleep.”

Noonan KJ, et al. JPO 2004; 24(6):726-31



# EVIDENCE-Spinal growth modulation by compression

1. Villemure I, Aubin CE, Dansereau J, Labelle H. *European Spine Journal*. 13:83, 2004
2. Newton PO, et.al. *Spine*. 30:2608, 2005
3. Stokes IA, Aronsson DD, et.al. *Journal of Orthopaedic Research*. 24:1327, 2006

# In Brace Correction Correlates to biomechanical effectiveness of brace treatment in AIS

“In the framework of the **Hueter-Volkman principle**...in brace correction predicts long-term outcome of the treatment and provides insights in the understanding of brace biomechanics.”

Clin J, Aubin CÉ, Sangole A, Labelle H, Parent S Spine 2010 ;35(18):1706-13.



# The Charleston Bending Brace

## Biomechanical Study

- This study quantified the Charleston Bending Brace's biomechanical effect, which consists in inverting the asymmetrical compressive loading in the major scoliotic curve
- The reduction of the major scoliotic curve varied between 58% and 97% and was in the range of published clinical data.
- Internal compressive stresses up to 1 MPa were generated on the convex side of the major scoliotic curve and tensile stresses up to 1 MPa on its concavity

**Labelle H, Clin J, Aubin CE, Parent S Spine 2010 1;35(19):E940-710**

# The Charleston Bending Brace

## Early Intervention Study

- Early intervention treatment with the CBB may reduce progression to full-time bracing threshold.
- This study focused specifically on curve magnitudes between 15-25 degrees in skeletally immature, pre-menarchal females
- 100% of patients in the control group (observation) resulted in curves progressing to standard criteria for full-time bracing
- 29% of patients randomized to night time wear were maintained without curve progression. (Statistically significant)

\* **Nighttime Bracing Versus Observation for Early Adolescent Idiopathic Scoliosis; Wiemann, Shah, MD, Price; *Pediatr Orthop* Volume 34, Number 6, September 2014**

# Bending Brace: Growth Modulation



- Bending increases pressure on convex vertebral growth centers to reduce growth
- Can be used for high thoracic curves
- Double curves are difficult to brace but can be treated by bending brace

# New Evidence. New Solutions.



## OBB-Standard

- Nighttime scoliosis management
- Benchmark for 35+ years
- Long single curves.

## NEW OBB-II with Lumbar Pad

- Nighttime dynamic treatment for Thoracolumbar Type II curves
- Dynamic alignment strap

## NEW OBB-Lite\*

- Nighttime wear for early intervention
- Cobb angles  $> 25^\circ$
- Neuromuscular patients
- Weaning transition



## The Original Bending Brace

**Non-Surgical, Nighttime, Scoliosis Management**

For all ordering information call Jackie Hooper at 843-884-2202

Send measurement forms and X-rays to:

jackie@cbb.org or fax to: 843-884-1554

or mail to: 524 Barbados Drive, Charleston, SC 29492

For certification information call Natasha at 843-577-9577 or

nhardina@cbb.org

