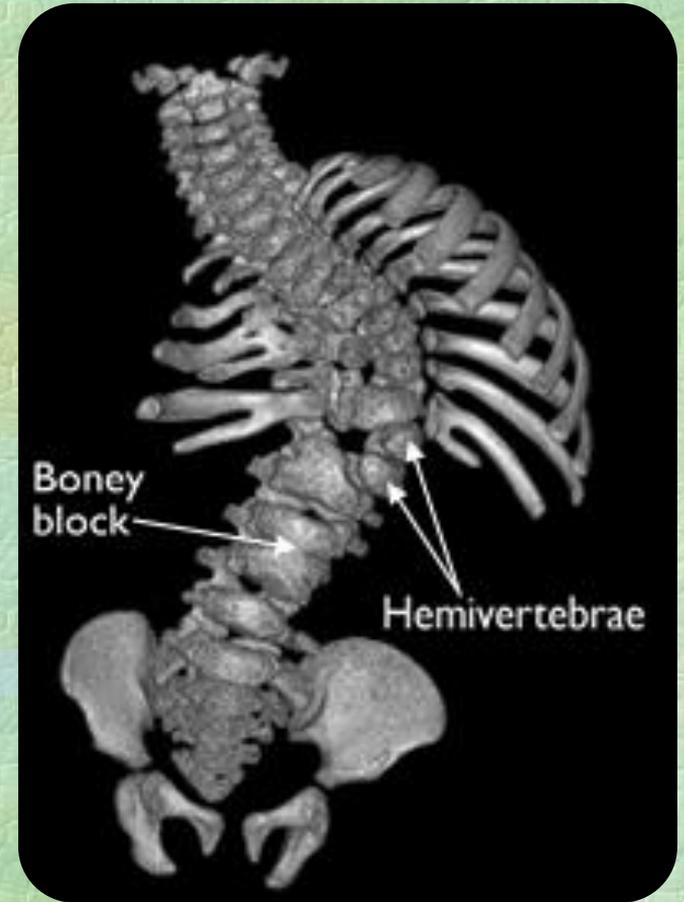


Scoliosis

Mojtaba Kamyab, PhD, Orthotist



Definition

- Four main categories
 - Congenital
 - Degenerative
 - Neuromuscular /syndromic
 - Idiopathic



Classification

Based on the order of occurrence in relation to the spinal growth.

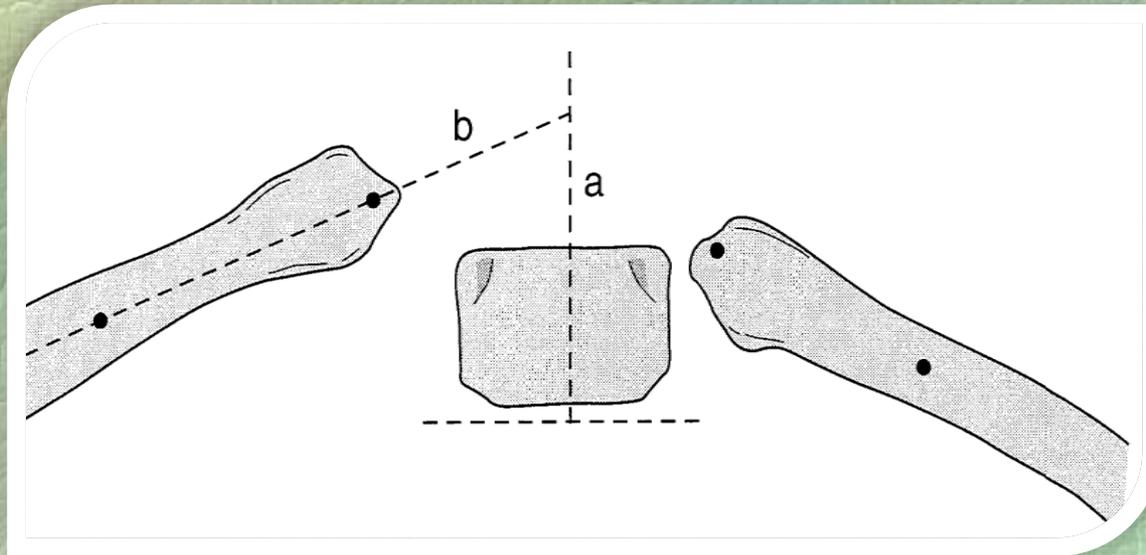
- Early-onset idiopathic scoliosis
 - Presence of scoliosis before 5 yrs old.
- Late-onset idiopathic scoliosis
 - Presence of scoliosis after 5 yrs old (before puberty).

EIS

- Mostly diagnosed within the first 6 months of life.
- More often in boys
- Mostly left thoracic pattern.
- Resolving is possible.

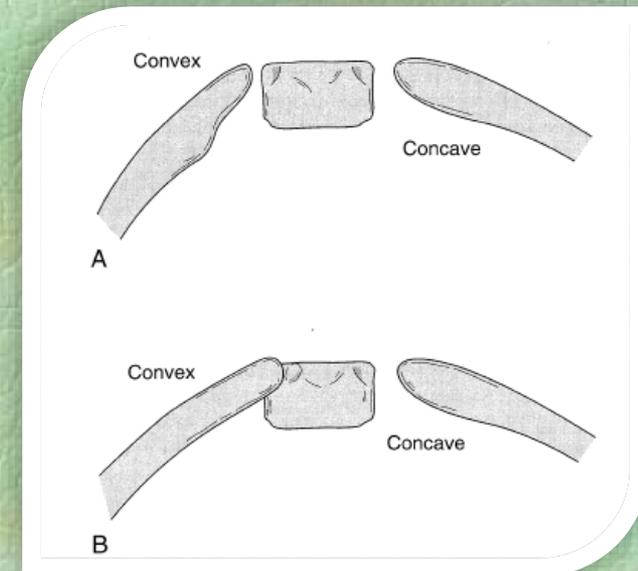
Prediction of resolving

- Rib-Vertebra Angle Difference
 - $RVAD < 20$: resolving is probable
 - $RVAD > 20$: progression is probable



Prediction of resolving

- The phase of the Rib Vertebra Angle Difference:
 - Phase 1: No overlapping
 - Resolving is possible.
 - Phase 2: The rib head intersecting the vertebral body.
 - Progression is almost certain.



Differences between idiopathic and non-idiopathic

Differentiation:

It depends on the degree of diagnosis.

Progression:

Unpredictable rate of progression

Compliance:

Due to associated problems is poor

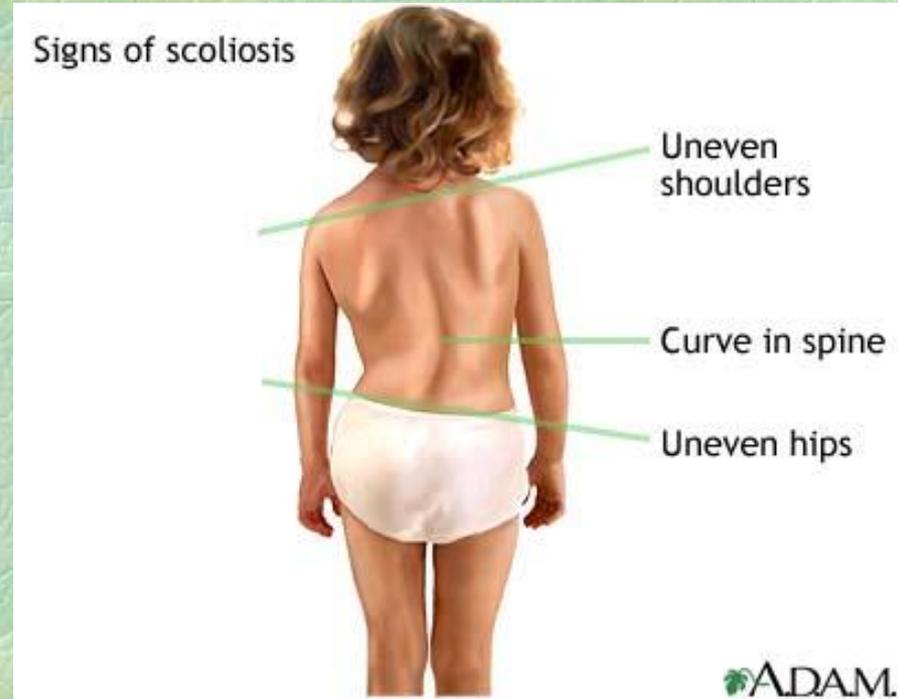
Pattern:

Irregular

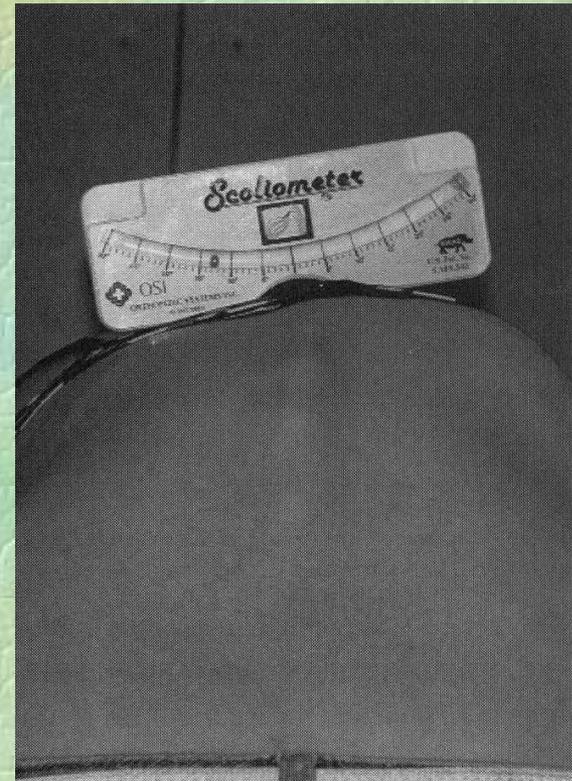


Physical Exam

- Iliac crest height
 - Leg length discrepancy
- Shoulder height
- Arm trunk space
- Scapular position
- Trunk shift
- Inspection of skin

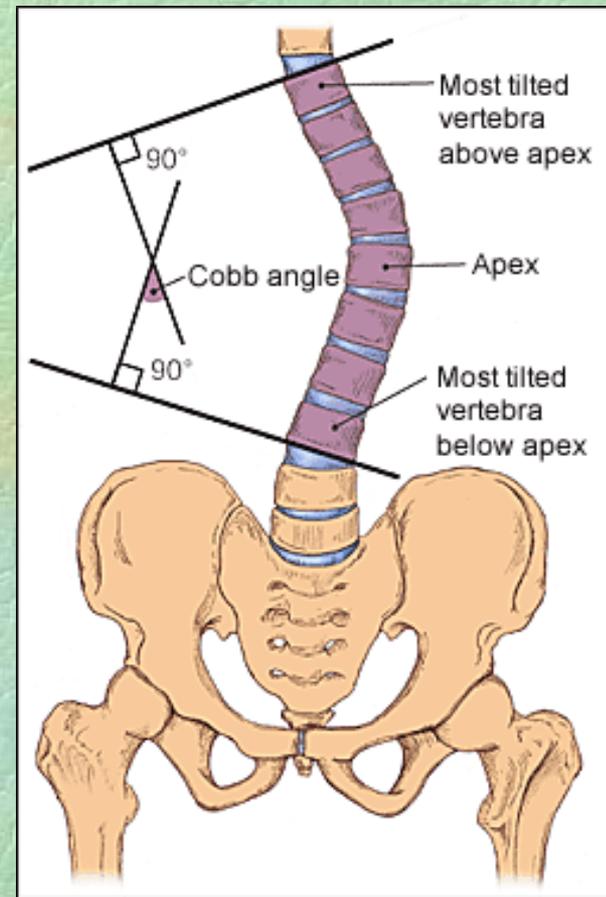


Forward Bend Test Adam's sign

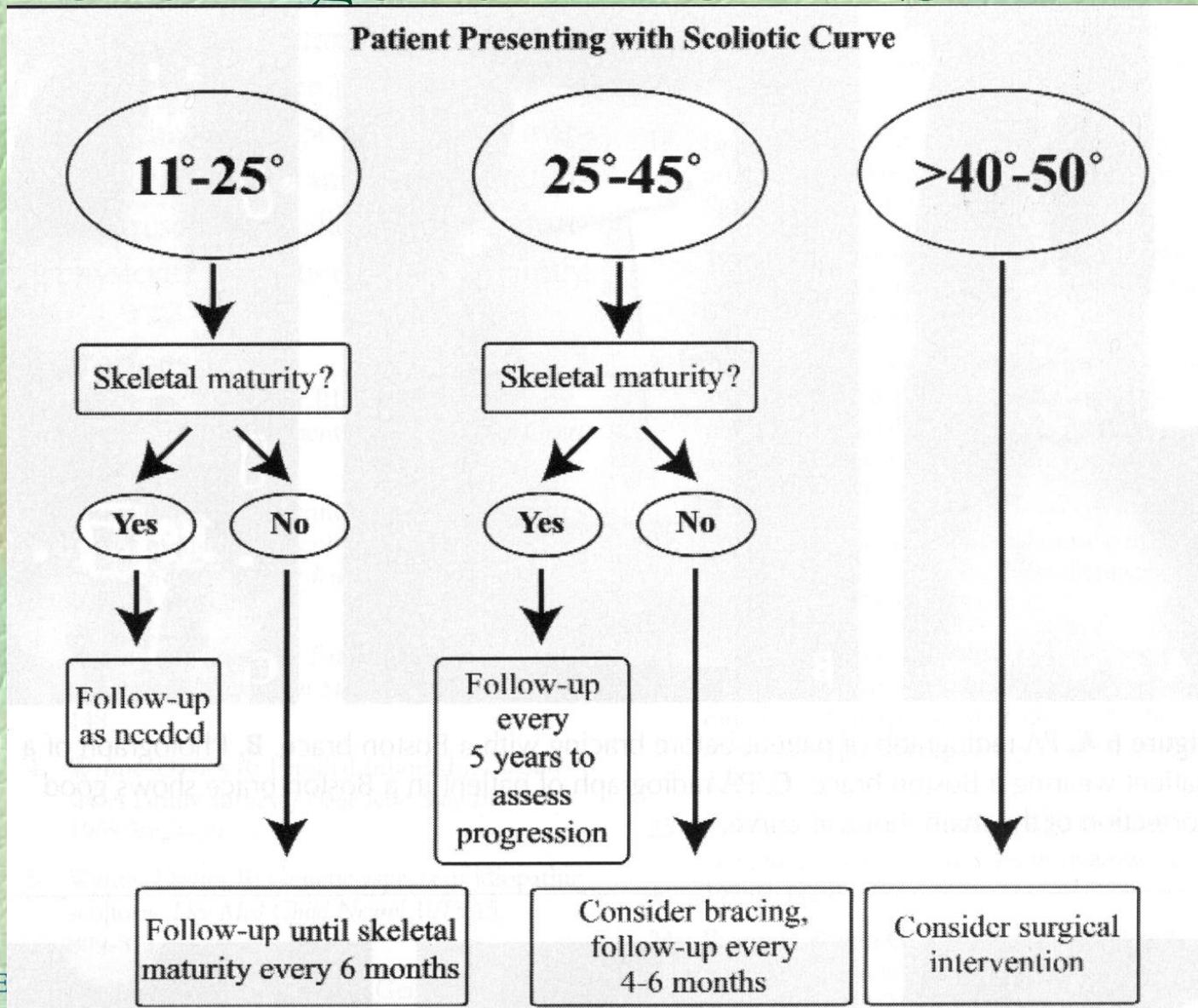


Imaging

- ✓ MRI is not required
- ✓ X-ray (or EOS)
 - ✓ Standing PA / Lateral
 - ✓ C1 – S1
 - ✓ True size is preferred
- ✓ Cobb method
- ✓ Risser sign



Treatment Algorithm for AIS



Natural History

TABLE II

INCIDENCE OF PROGRESSION AS RELATED TO THE
MAGNITUDE OF THE CURVE AND THE RISSER SIGN

Risser Sign	Percentage of Curves that Progressed	
	5 to 19-Degree Curves	20 to 29-Degree Curves
Grade 0 or 1	22	68
Grade 2, 3, or 4	1.6	25

TABLE III

INCIDENCE OF PROGRESSION AS RELATED TO THE MAGNITUDE
OF THE CURVE AND THE AGE OF THE PATIENT WHEN FIRST SEEN

Age When First Seen (Yrs.)	Percentage of Curves that Progressed*	
	5 to 19-Degree Curves	20 to 29-Degree Curves
10 and younger	45 (38)	100† (10)
11 to 12	23 (147)	51 (61)
13 to 14	8 (201)	37 (119)
15 and older	4 (67)	16 (84)

* Numbers in parentheses indicate the number of patients in each group.

† Note that this figure of 100 per cent is based on only ten patients.

Natural History

- Trying to prevent curves from reaching at skeletal maturity:
 - >40 degree thoracic
 - >30 degree lumbar
- Because these curves continue to progress in adulthood
- Adults with untreated, more mild scoliosis do well in adulthood



Why Milwaukee brace is still considered?

❖ Designed by Blount and Schmidt in 1946 for postoperative immobilization.

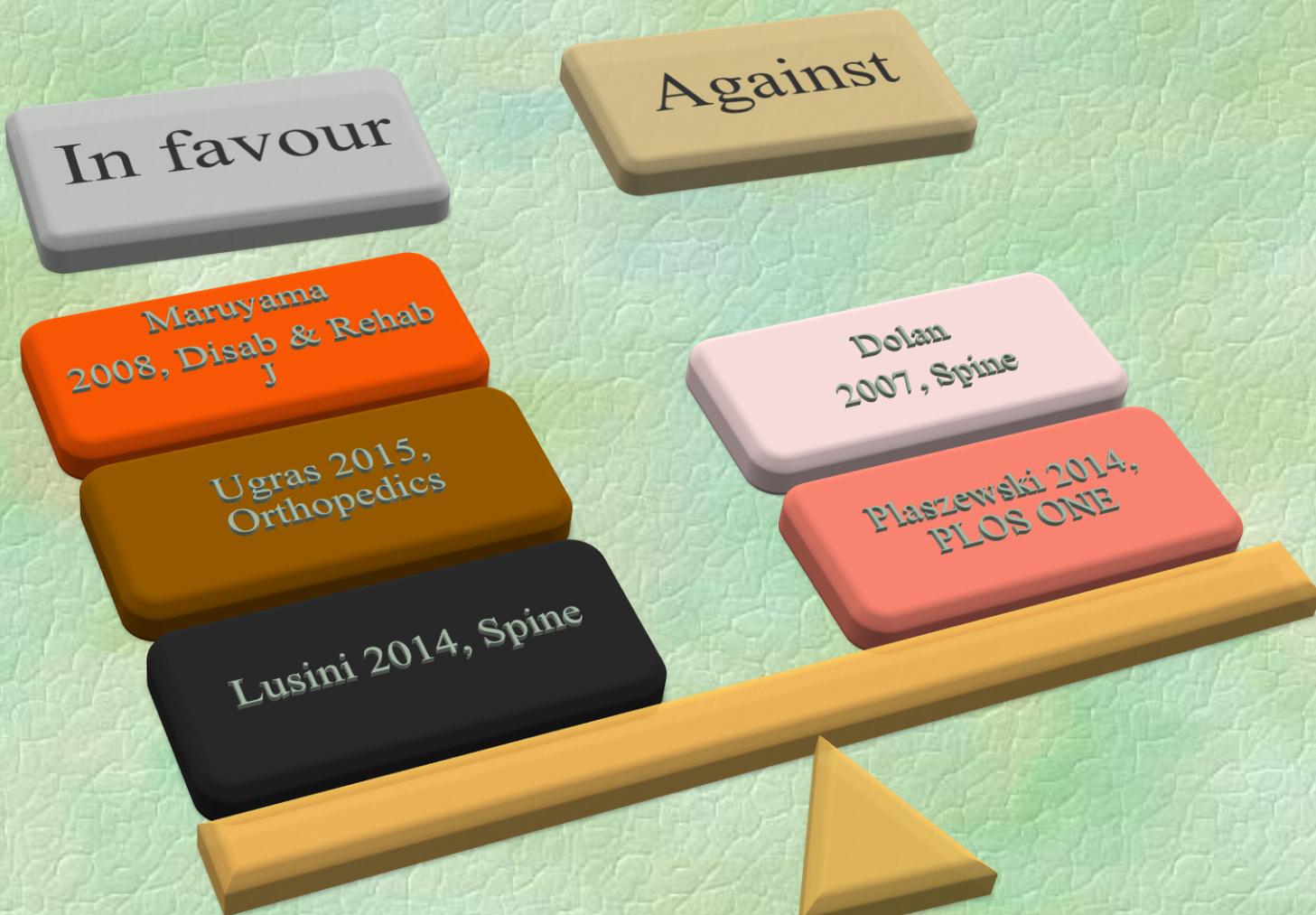
- An open design
- Dynamic forces
- Fully adjustable
- Effectiveness



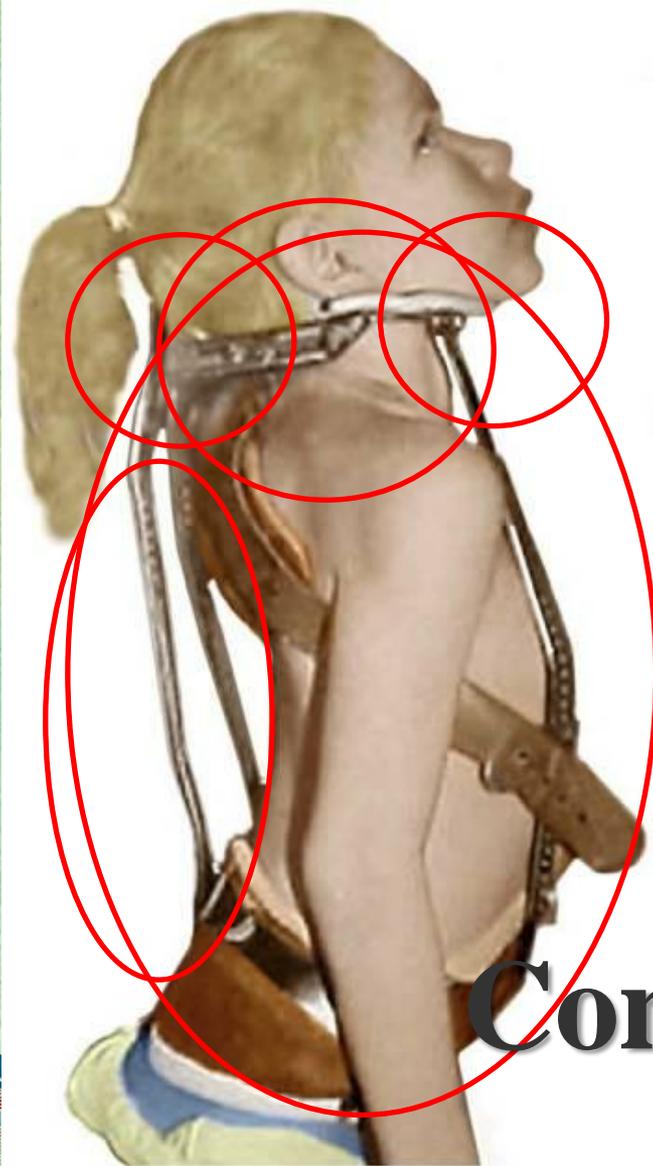
What studies recommend?

- ❖ Milwaukee brace is the most effective treatment for adolescent idiopathic scoliosis (Maruyama, 2008) – A systematic review.
- ❖ Milwaukee scored significantly higher than Boston, TLSO and Charleston bending orthosis in the overall quality of life evaluation (Climent, 1999)
- ❖ The compliance of patients in a dynamic SpineCor is as limited as in a conventional brace (Hasler, 2010)

Why brace is effective in some cases and not effective in others?

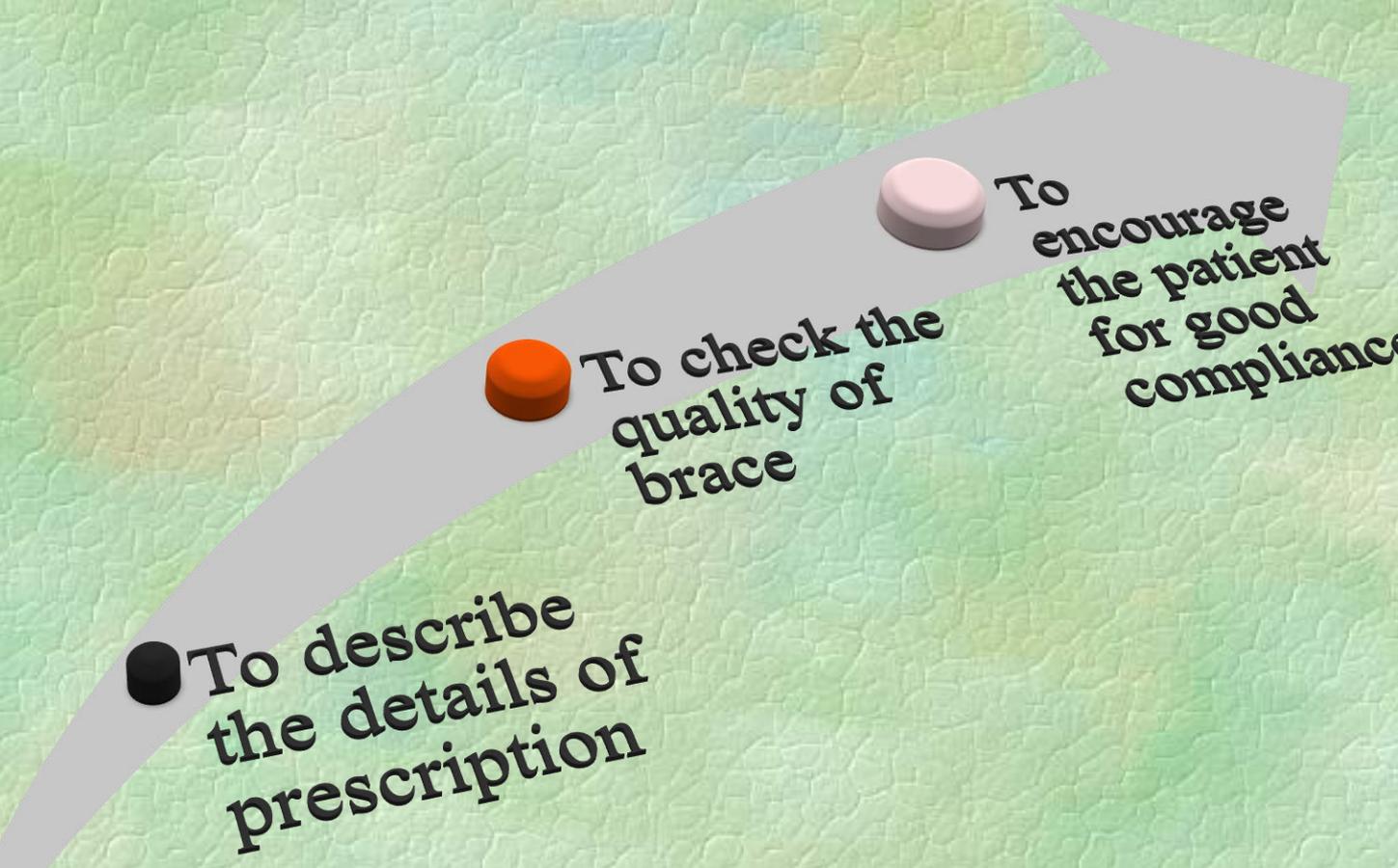


Which orthosis is Milwaukee?



Compliance

What can we do to make orthosis more effective?



● To describe the details of prescription



● To check the quality of brace



● To encourage the patient for good compliance

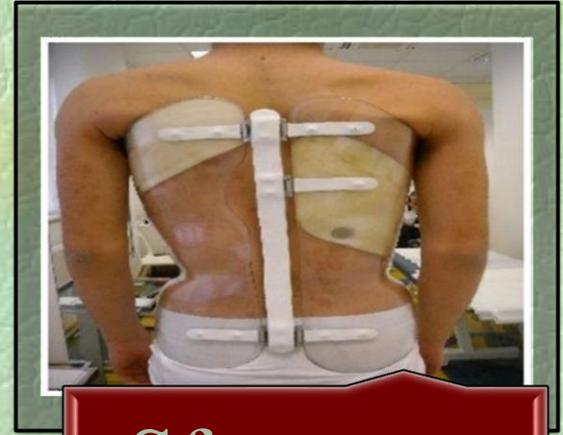
What other substitutes exist for Milwaukee?



Boston



Cheneau



Sforzesco



Spinecor



TriaC



Scoliotic

Which one helps our patients?

- ❑ No other orthosis have cervical component.
- ❑ No other orthosis is as adaptable as MB.
- ❑ Single lumbar curve or single thoracolumbar curves
- ❑ Caudal to T8



When MB is not a choice which substitute is preferred?

□ Sforzesco

- Open design
- Strong structure
- Editable
- Evidence based
- Acceptable look



What to do after start of bracing?

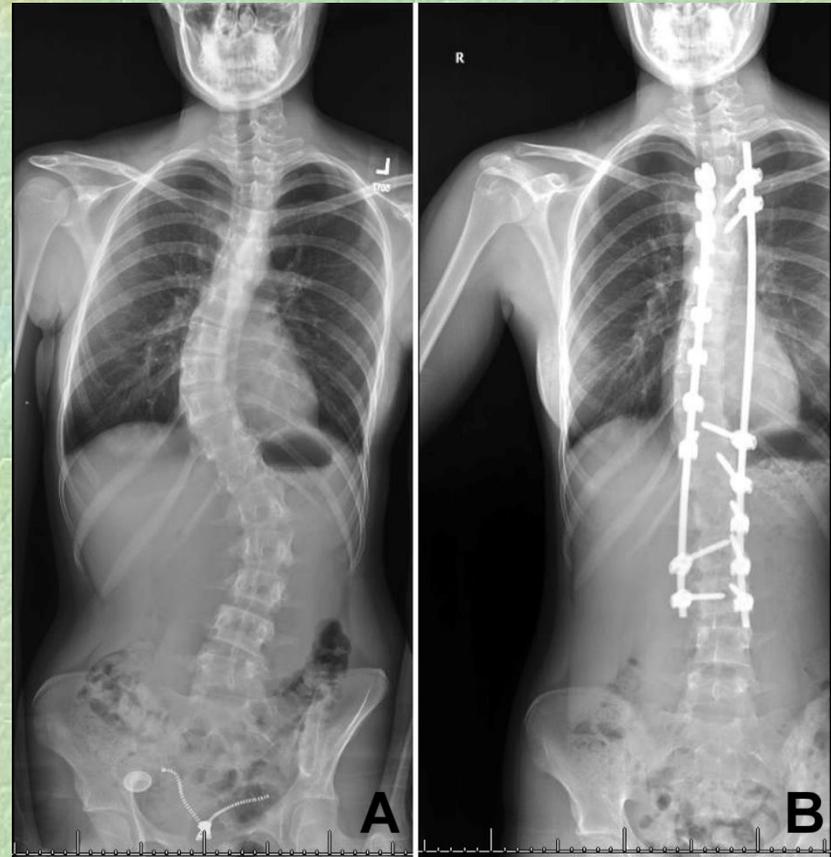
- PA/Lateral x-ray one month after start of bracing
 - In brace curve correction
 - Pad location
- Every 4 to 6 months thereafter
- When brace is considered unsuccessful?
 - Increase of 5 degrees in two consecutive x-rays.
- When Weaning can be started?
 - Scoliosis less than 10 or kyphosis less than 35
 - Reaching skeletal maturity
- Weaning process:
 - 4 hours out of brace, for 4 month → x-ray out of brace for 4 hours → another 4 hours for 4 months

When to prescribe an orthosis?

- Based on the protocol
- Congenital scoliosis to postpone surgery
- AIS to achieve skeletal maturity then perform surgery.
- Adult scoliosis?

Surgery

- ❑ Failed bracing
- ❑ Curves >45 degrees
- ❑ Unbalanced curves >40 degrees
- ❑ PSF



اساس از توجہ شما

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