IDIOPATHIC SCOLIOSIS

SpineCor Concept

Etiopathogenesis &
The Dynamic Corrective Brace Principles
SpineCor Brace

- The First and Only True Dynamic Corrective Brace for Idiopathic Scoliosis
- Utilises a radically new Treatment Approach based on the Etiology & Pathogenesis of Idiopathic Scoliosis
IDIOPATHIC SCOLIOSIS

NEURO-MUSCULO-SKELETAL PATHOLOGY in GROWTH and MATURATION
Dr Christine Coillard’s Concept of Idiopathic Scoliosis

- Neuro-musculo-skeletal pathology
- Clear evidence of abnormalities in all 3 areas in advanced cases

No accepted publications detailing the precise causation and subsequent sequence of events in the disease process.
The initiation is Genetic & the Pathogenesis Involves:

- 3 dimensional deformation of the spine
- Postural disorganization
- Unsynchronized growth
- Particular movement patterns of the body
IDIOPATHIC SCOLIOSIS: ETIOPATHOGENIC CONCEPT

NEURO-MUSCULO-SKELETAL PATHOLOGY

Genetic temporal fault = Unsynchronised osseous growth

Scoliosis

Dysfunction of the neuro-muscular-skeletal system

Hormonal maturation

Functional unit deformation

Rupture of the internal preloaded spine
Homeobox Genes

Genetic temporal fault

Delayed ossification in the posterio-lateral part of the vertebra

Initial deformity
IDIOPATHIC SCOLIOSIS: ETIO-PATHOGENIC CONCEPT

NEURO-MUSCULO-SKELETAL PATHOLOGY

Genetic temporal fault = Unsynchronised osseous growth

Specifically confined to one vertebra + half of the superior + half of the inferior vertebra

Functional unit deformation
General Bone Deformity in an Advanced Case

Localised vertebral bone deformity is present early on and is proposed to be the initialising factor.

Deformation of the pelvis
Large Bony Deformation

Limitation to conservative treatment

- Laying x-ray
  - Flexibility of the curve
  - Extent of bone deformity

- Comparison of laying x-ray vs erect x-ray Cobb angles
  - Potential of reducibility
  - Potential of treatment success
3D Deformities

1. Lateral Wedging

1. Anterior/Posterior Wedging

2. Rotational Deformity
Vertebra - 4 Growth Plates

- **Anterior**
  - vertebral body

- **Lt Posterior-lateral**
  - transverse process, part of the body, articular process and laminar

- **Rt Posterior-lateral**
  - transverse process, part of the body, articular process and laminar

- **Spinous process**
3D Deformities

Lateral Wedging

- Intercostal asymmetry
  - Decreased concave side / increased convex side
- Rib vertebral angle differences
3D Deformities

Anterior/Posterior Wedging

Modification of the sagittal profile

- Hypokyphosis,
- flat back
3D Deformities

Rotational Deformity

Prescribing an arc from spinous process through the vertebral body

Rotation in the rest of the spine is a disorientation as a result of this.
Vertebral Growth Plate Dynamic Loading
Fundamental research proved that the bone growth is stimulated by the alternation of compression and decompression.

Pure distraction does not stimulate the bone growth.
Catch up of the Vertebral Side Deficient in Growth

1. Curve reduction/opening needs to be focused at the level of the initiating deformity

2. Dynamic opening is necessary to stimulate bone growth for true correction to occur
   - Static opening may stop progression but does not facilitate true correction
Initial Bone Deformity is Not a Consequence of the Scoliosis but a Causation of it

Growth disharmony resulting in localised vertebral deformity is the initiating factor
Muscles/Scoliosis Patients

- Length, strength and direction altered
- Shorter – concave side
- Longer – convex side

Can not actively work to correct the progressing deformity
Action of the Brace

Activate those muscles GLOBALLY

CORRECTIVE MOVEMENT

DREIDIMENSIONALE SKOLIOSE BEHANDLUNG
CHRISTA LEHNERT-SCHROTH 1998
SpineCor Brace

- Overcorrecting the posture by the use of the Corrective Movement
- Dynamic forces
NEUROLOGICAL CONTROL

SPINAL SYSTEM

GROWTH MATURATION

MOTOR CONTROL CENTER

FEED BACK

PERIPHERAL RECEPTORS
Ligament / muscle joint capsule
IDIOPATHIC SCOLIOSIS:
ETIO-PATHOGENIC CONCEPT

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NEURO-MUSCULO-SKELETAL PATHOLOGY

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The prognosis in any one patient will depend on the timing and severity of the insult.
Age of onset is a significant but not the only factor determining risk of progression.
PREDICTORS OF PROGRESSION IN IDIOPATHIC SCOLIOSIS

- Genetic Insult Severity
- Velocity of Growth
- Age
- Maturation
- The Starting Time of Treatment
- How Old is the Deformity
SpineCor is NOT just another Scoliosis Brace

- Does not use 3-Point Pressure traditional Biomechanical principles

- Uses Global Postural Re-education

To treat the muscular, neurological and osseous elements of the scoliosis
Dynamic Corrective Bracing
4 Modes of Action

1. Dynamic opening of curves
2. Normalization of postural disorganization
   - Globally and dynamically overcorrecting the posture
3. Neuromuscular re-education
4. Neuromuscular integration
IDIOPATHIC SCOLIOSIS

DYNAMIC FORCES ↔ NEW MOVEMENT STRATEGY

PROGRESSIVE CURVE REDUCTION + NEURO-MUSCULAR INTEGRATION
SpineCor Brace Construction
SpineCor Brace Fitting

STEP 1

STEP 2

STEP 3

STEP 4

STEP 5
SpineCor Brace Fitted

Very easy to put it on and take it off – a minute or so!
Right Thoracic Type 1 curve
Global Corrective Movement Strategy
Effectiveness of the Corrective Movement
Case Study – Initial x-rays

Th36

1814104
21-01-98
Risser-0

1814104
21-01-98
Risser 0
Brace fitting – First x-ray in brace
2 months after brace fitting
6 months after brace fitting
1 year after brace fitting

1 year ½ after brace fitting
Reduction of the vertebral wedge

Before brace fitting

At weaning point
Normalization of postural disorganization

Before treatment

After treatment
UNIQUE ASPECTS OF SPINECOR TREATMENT

- SpineCor offers a real opportunity to provide true sustainable long term improvement of curves
  - Must be worn 20 hours per day
  - Minimum of 18 months
SpineCor Treatment Vs Rigid Brace

- Rare occurrence of skin irritation but when this does occur it is easily managed & seldom long lasting
  - Bodysuit
  - Comfort band
  - Pads

- Ultimate post brace Cobb angles are very stable and are superior to rigid brace results
SpineCor Patient
Advantages

- Improved Comfort
- Easily concealed under clothing
- Good cosmetic
- Improved self image
- Increased compliance
- Allows normal activities of daily living
SpineCor

Indications

1. Idiopathic scoliosis patients
2. Initial Cobb angle between $15^\circ$ and $50^\circ$
3. Initial Risser sign 0, 1, 2 ... 3
4. No restriction except for swimming
# Idiopathic Scoliosis

## Spinecor Treatment Prognosis

<table>
<thead>
<tr>
<th>Start of Treatment</th>
<th>Principal Objective</th>
<th>Quality of Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Main Growth Spurt</td>
<td>Correction</td>
<td>High</td>
</tr>
<tr>
<td>During or After Main Growth Spurt</td>
<td>Stabilisation</td>
<td>Moderate</td>
</tr>
</tbody>
</table>
SpineCor Certification Requirements

- 2 day Phase I Training:
  Theory & Practical Exercises

- 2 Day Phase II Training:
  Patient Treatments

- SpineCor Accreditation:
  Delegates must fulfil all of the training objectives for Phase I & II before being certified as an Accredited SpineCor treatment provider
### Phase I – Day One
#### Morning Session

<table>
<thead>
<tr>
<th>New Concept and The SpineCor System</th>
<th>Multimedia presentation of Dr. Coillard’s etiopathogenic concept of idiopathic scoliosis and basic principles of scoliosis treatment with the SpineCor System.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SpineCor Concept</td>
<td>Overview of the SpineCor treatment concept.</td>
</tr>
<tr>
<td>Clinical Evaluation</td>
<td>Review of the key elements of the clinical exam.</td>
</tr>
<tr>
<td>X-ray Evaluation</td>
<td>Review of the key elements of the evaluation of the x-rays.</td>
</tr>
<tr>
<td>New Radiological Classification</td>
<td>Radiological characteristics of each class and sub-class of scoliosis patients.</td>
</tr>
</tbody>
</table>
# Phase I – Day One

## Afternoon Session

<table>
<thead>
<tr>
<th>Topic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Corrective Movements &amp; Brace Fitting</strong></td>
<td>Individual corrective movements, class specific corrective movements with video demonstration.</td>
</tr>
<tr>
<td><strong>SpineCor Assistant Software (3.6 Version)</strong></td>
<td>Role of the SAS in SpineCor treatment.</td>
</tr>
<tr>
<td><strong>Physiotherapy Program &amp; SpineCor Treatment</strong></td>
<td>Role of physiotherapy treatment to compliment SpineCor treatment.</td>
</tr>
<tr>
<td><strong>Treatment Protocols &amp; Patient Approach</strong></td>
<td>Patient education. SpineCor treatment, x-ray and weaning protocols.</td>
</tr>
<tr>
<td><strong>Multiple Choice Questions</strong></td>
<td>Examination with Open Book policy.</td>
</tr>
</tbody>
</table>
## Phase I – Day Two Morning Session

| SpineCor Classification  
| (Practical Exercise) | Classification of example patients using brief history, x-rays and photographs. Each delegate to practice manual classification of five example patients. Session to be supported by trainers who will provide guidance to delegates but not give answers. |
|-----------------------|
| SAS Software          
| (Practical Exercise)  | Software practice using the same five example patients from the classification session. Tasks to include:  
- Creation of new patient file  
- Data entry.  
- Classification : class selection / acceptance  
- Brace fitting instructions  
- Corrective movement video’s |
<table>
<thead>
<tr>
<th>Brace Fittings &amp; Corrective Movement With Model (Demonstration)</th>
<th>Demonstration of five different classification corrective movements and appropriate brace fittings. Including:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Standard pelvic base fitting</td>
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<td></td>
<td>- Standard bolero fitting</td>
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<tr>
<td></td>
<td>- Corrective movement and band fittings for:</td>
</tr>
<tr>
<td></td>
<td>RT Thoracic Type I</td>
</tr>
<tr>
<td></td>
<td>RT Thoracic Type III</td>
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</tbody>
</table>
Phase II Training
1 – 2 Days

- 4 – 6 patients to be treated during Phase II

- Patient selection criteria for training.
  - Idiopathic Scoliosis
  - Cobb angle equal or below 35°
  - Risser 0, 1 or 2
  - Girls pre-menarchial
  - Boys no voice change
  - Preferably single curves

- X-rays – recent (less than 1 month old) Erect PA and Lateral views.
Phase II Training

- This on site training is designed to reinforce the treatment principles taught in Phase I.

- Delegates clinical assessment and brace fitting skills will be evaluated for each patient.

- Final accreditation will be based on scores from Phase I exam and practical exercises as well as Phase II patient treatment evaluations.
REFERENCES


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