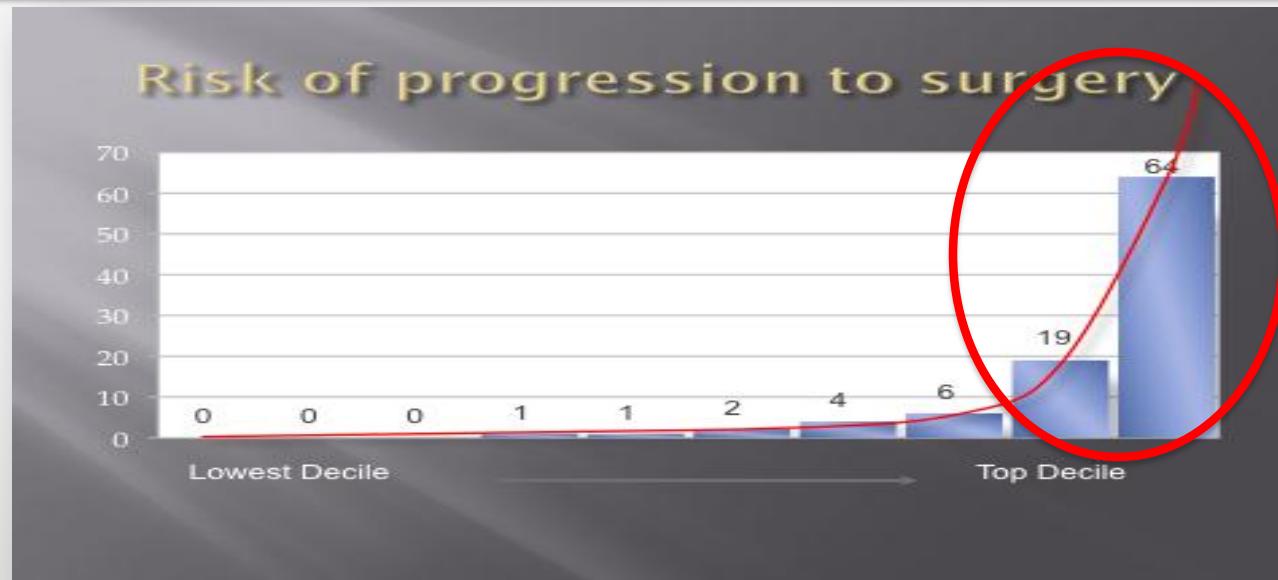


# Actualités du traitement orthopédique des déviations rachidiennes

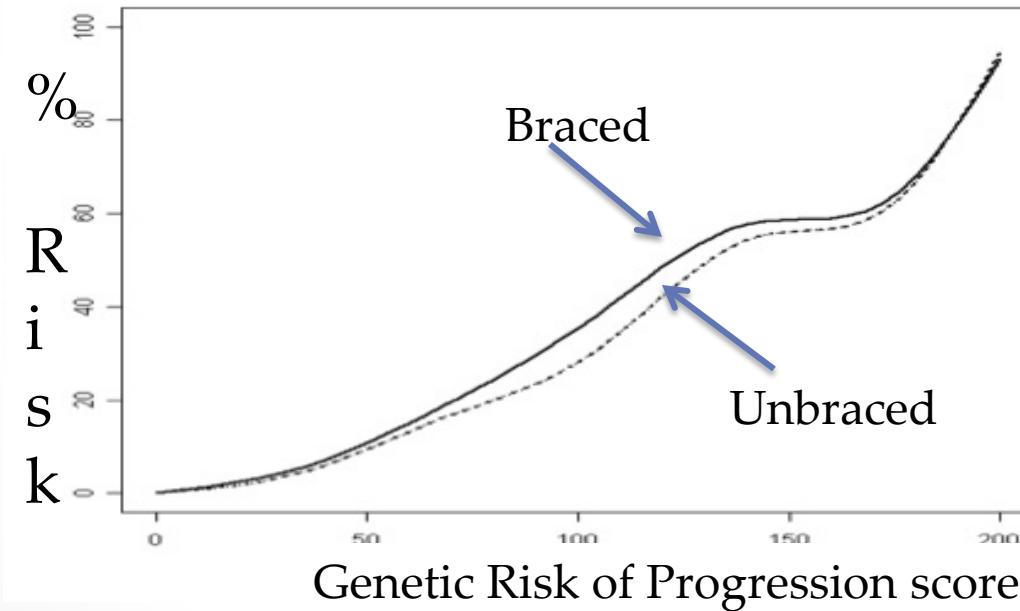
Jean Claude de Mauroy  
*Clinique du Parc - Lyon*

# Genome-wide Association Studies

- 276 single nucleotide polymorphism (SNP) markers associated with AIS progression.
- 53 SNPs with highest prognostic value for curve progression, e.g. causative and protective genes.
- SNP markers utilized for calculating an AIS progression score.



In this retrospective multi-center study, we could not demonstrate that bracing had a major influence on the natural history of AIS



Les corsets  
sans plâtre  
préalable ne  
modifient pas  
l'histoire  
naturelle de  
la scoliose

# BRAIST

## Bracing in Adolescent Idiopathic Scoliosis Trial (BrAIST)

**This study is currently recruiting participants.**

Verified by National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), September 2009

First Received: March 14, 2007 Last Updated: September 1, 2009 [History of Changes](#)

Sponsor:	<a href="#">National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)</a>
Collaborators:	University of Iowa Canadian Institutes of Health Research (CIHR) Shriners Hospitals for Children Children's Mercy Hospital Kansas City University of Rochester
Information provided by:	National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
ClinicalTrials.gov Identifier:	NCT00448448

### ► Purpose

Adolescent idiopathic scoliosis (AIS) is a structural curve of the spine with no clear underlying cause. Bracing is currently the standard of care for preventing curve progression and treating AIS. However, the effectiveness of bracing remains unclear. The purpose of this study is to compare the risk of curve progression in adolescents with AIS who wear a brace versus those who do not and to determine whether there are reliable factors that can predict the usefulness of bracing for a particular individual with AIS.



Children need Children's.<sup>®</sup>



An agency of the Provincial  
Health Services Authority



Children's Hospital Boston



## Welcome to *BraIIST* - *The Bracing in Adolescent Idiopathic Scoliosis Trial*



The Children's Hospital of Philadelphia®

Hope lives here.



# Critères d'inclusion

## ► Eligibility

Ages Eligible for Study: 10 Years to 15 Years  
Genders Eligible for Study: Both  
Accepts Healthy Volunteers: No

## Criteria

### Inclusion Criteria:

- Diagnosis of AIS
- Skeletally immature (Risser grade 0, 1, or 2)
- Pre-menarchal or post-menarchal by no more than 1 year
- Primary Cobb angle between 20 and 40 degrees
- Curve apex caudal to T7 vertebrae
- Physical and mental ability to adhere to bracing protocol
- Ability to read and understand English, Spanish, or French
- Documented insurance coverage and/or personal willingness to pay for treatment

### Exclusion Criteria:

- Diagnosis of other musculoskeletal or developmental illness that might be responsible for the spinal curvature
- History of previous surgical or orthotic treatment for AIS

Scoliose idiopathique de l'adolescent  
Fille ou garçon  
De 10 à 15 ans  
Risser 0-2  
Courbures entre 20° et 40°

# TLSO sans plâtre préalable

RIEN



Randomisé

Porté au moins 18 heures par jour

# 1er bilan – août 2010

## Tracking Information

<b>First Received Date</b> <small>ICMJE</small>	March 14, 2007
<b>Last Updated Date</b>	September 1, 2009
<b>Start Date</b> <small>ICMJE</small>	February 2007
<b>Estimated Primary Completion Date</b>	August 2010 (final data collection date for primary outcome measure)
<b>Current Primary Outcome Measures</b> <small>ICMJE</small>  (submitted: February 29, 2008)	<ul style="list-style-type: none"><li>Progression of Cobb angle to greater than 50 degrees (proxy for surgical indication) [ Time Frame: Measured throughout study ] [ Designated as safety issue: No ]</li><li>Cessation of skeletal growth [ Time Frame: Measured throughout study ] [ Designated as safety issue: No ]</li></ul>
<b>Original Primary Outcome Measures</b> <small>ICMJE</small>  (submitted: March 14, 2007)	<ul style="list-style-type: none"><li>Progression of Cobb angle to greater than 50 degrees (proxy for surgical indication)</li><li>Cessation of skeletal growth</li></ul>
<b>Change History</b>	<a href="#">Complete list of historical versions of study NCT00448448 on ClinicalTrials.gov Archive Site</a>
<b>Current Secondary Outcome Measures</b> <small>ICMJE</small>  (submitted: February 29, 2008)	<ul style="list-style-type: none"><li>Clinical measures [ Time Frame: Measured every 6 months ] [ Designated as safety issue: No ]</li><li>Radiographic measures [ Time Frame: Measured every 6 months ] [ Designated as safety issue: No ]</li><li>Psychosocial measures [ Time Frame: Measured every 6 months ] [ Designated as safety issue: Yes ]</li></ul>

# Le mail



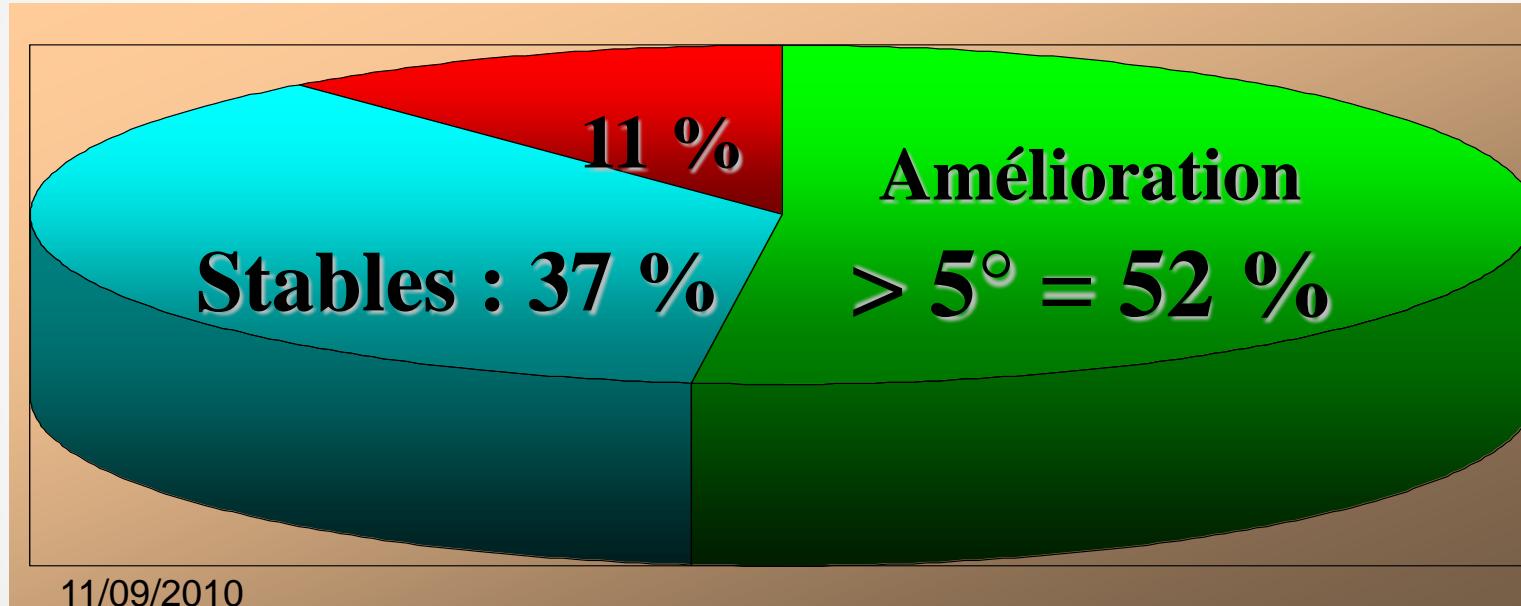
- Hello Dr. de Mauroy -
- Very nice to hear from you. I'm sorry I wasn't able to attend SOSORT this year.
- **My message about bracing is that there is no high level evidence supporting the hypothesis that bracing decreases curve progression to a Cobb angle of 50 degrees or greater in children at high risk for curve progression**
- This message has been supported by several systematic reviews including the recent Cochrane Collaboration report headed by Dr. Negrini.
- I would love to hear more about your study and to offer my assistance - please let me know if I can help.
- Lori Dolan

# Le plâtre et le corset réglable

Notre expérience...

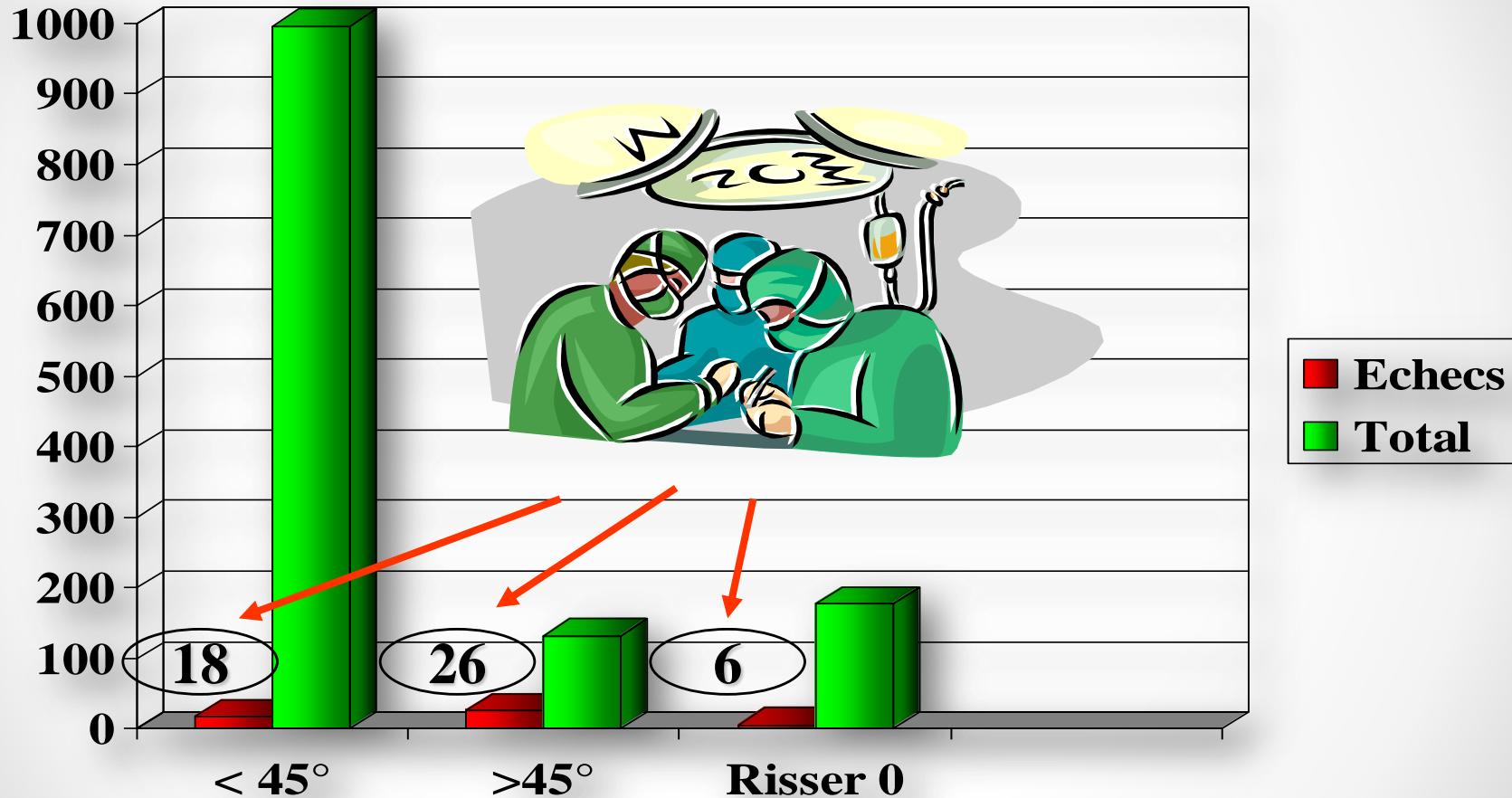


# Statistique Générale

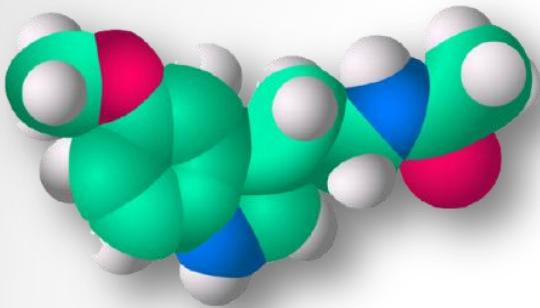


**1228 scolioses**

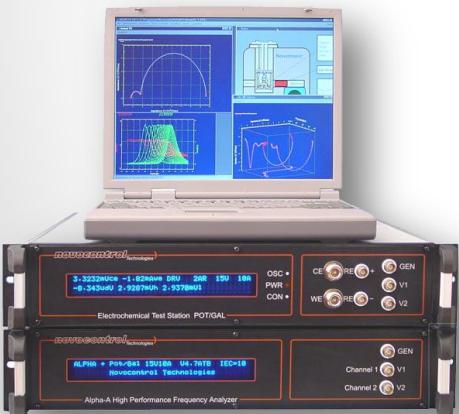
# Les échecs



# Tests prédictifs de l'évolutivité des scolioses



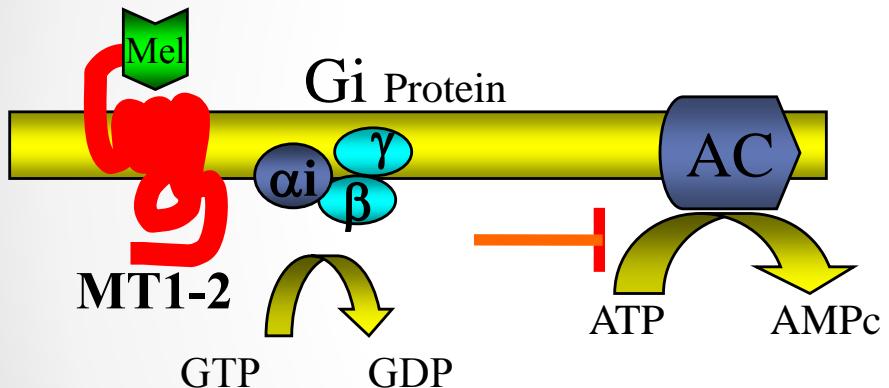
Molécule de Mélatonine



l'ablation de la glande pineale chez le poulet produit une scoliose ressemblant sous plusieurs aspects à la pathologie humaine. La pertinence biologique de la mélatonine dans la scoliose est controversée, étant donné que la majorité des études chez l'homme n'ont pu mettre en évidence une diminution significative des niveaux de mélatonine circulante chez les patients scoliotiques.

Il existe un dysfonctionnement dans la signalisation de la mélatonine au niveau des tissus musculo-squelettiques chez une série de patients atteints de AIS (Moreau & coll. 2004). Ce défaut a été confirmé chez un plus grand nombre de patients ainsi qu'en utilisant une nouvelle technologie (spectroscopie cellulaire diélectrique).

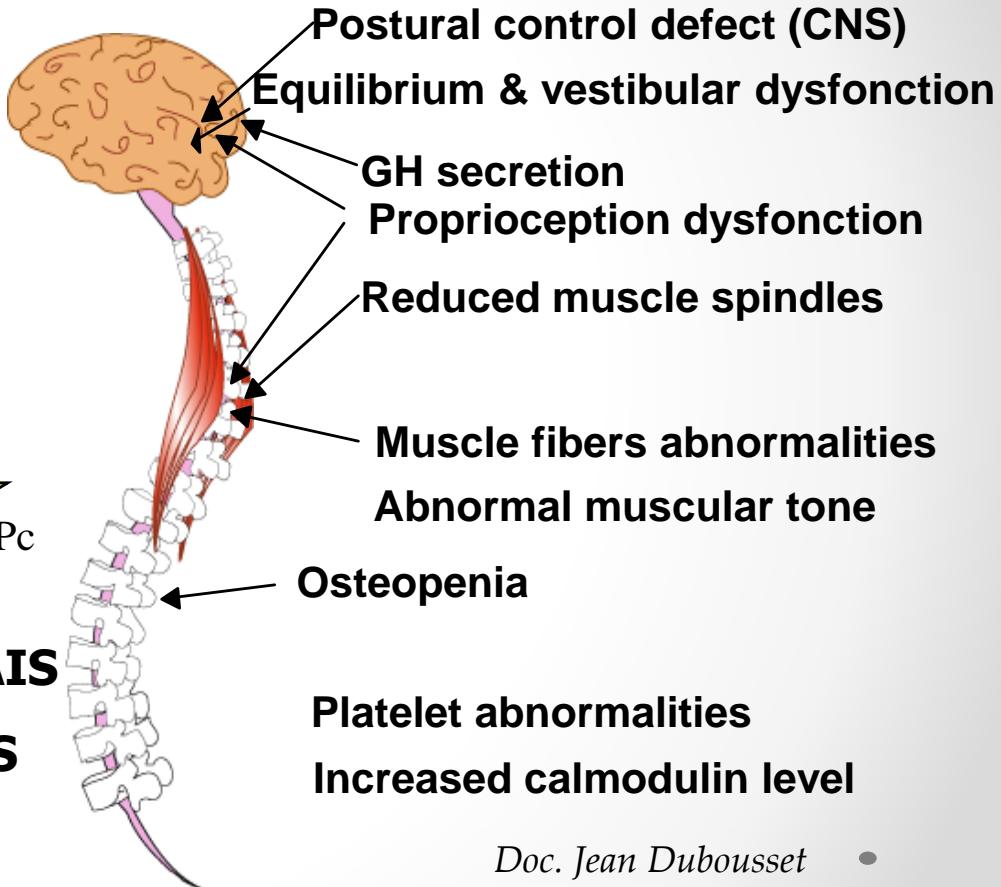
# Tissues & systems targeted by melatonin action and affected in AIS



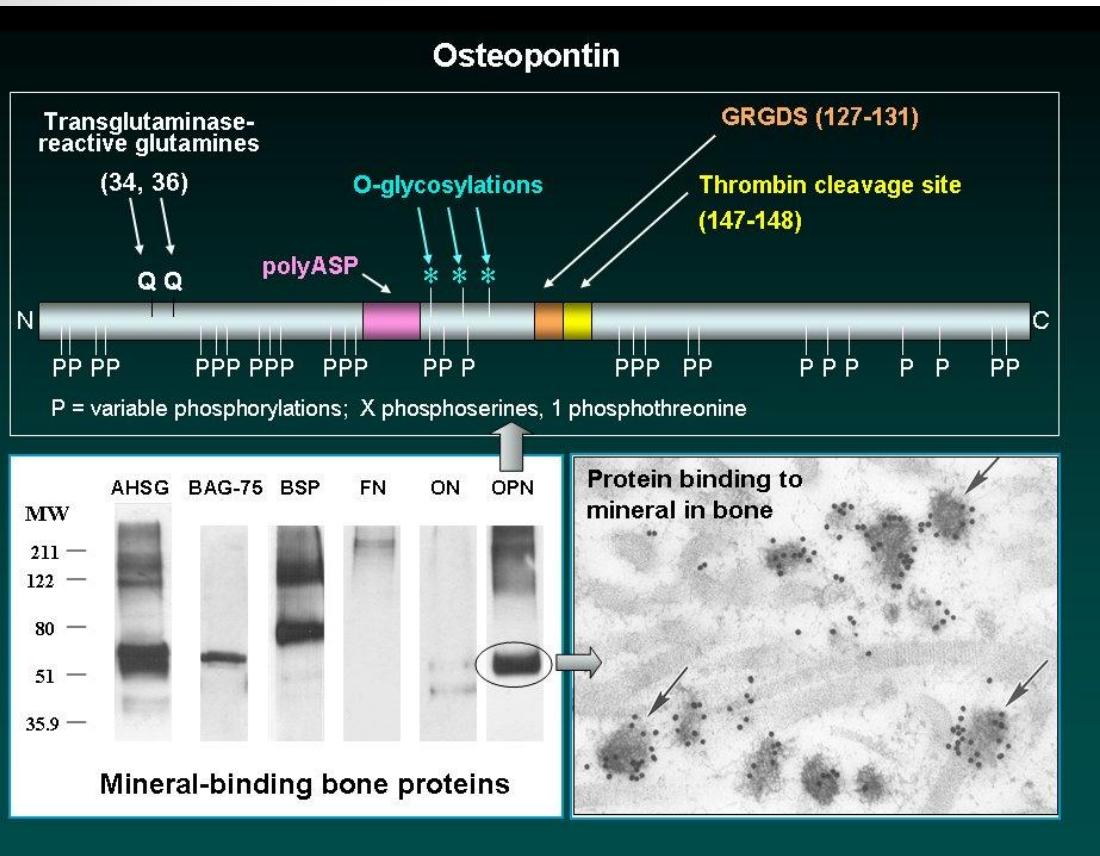
**Melatonin signaling dysfunction in AIS**  
**Molecular expression patterns in AIS**

Osteoblast culture isolated from bone  
Specimen AIS 33

Melatonin signaling clearly impaired in osteoblast from AIS



# Mesure de l'ostéopontine...



**Spécificité et sensibilité du test : 100%.**

**La dysfonction s'observe uniquement chez les patients scoliotiques. Elle se retrouve au niveau des ostéoblastes, du muscle et des lymphocytes.**

**Le test a été positif pour 33 % d'enfants ne présentant pas initialement une scoliose. La scoliose s'est confirmée cliniquement dans les mois suivants...**



# **HISTORICAL LYONAISE BRACE TREATMENT FOR ADOLESCENT HYPERKYPHOSIS.**

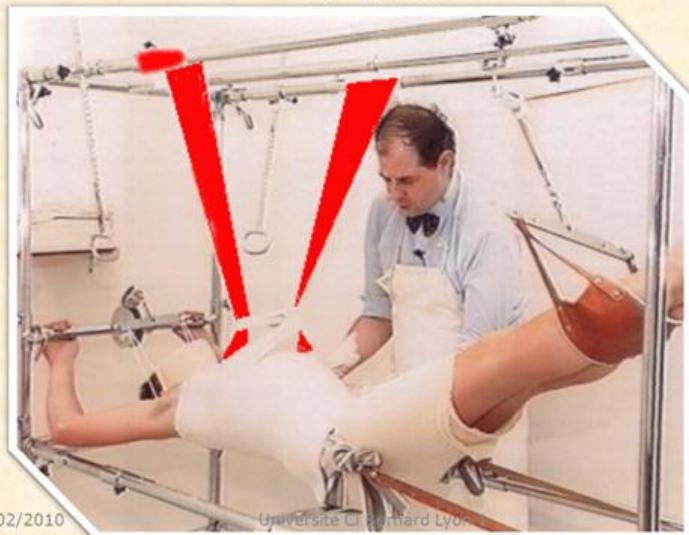
**RESULTS OF 272 CASES REVIEWED 2 YEARS  
MINIMUM AFTER REMOVAL OF THE BRACE.**

**Jean Claude de Mauroy, Pierre Vallèse,  
Paule Fender and Cyril Lecante**

*Clinique du Parc Lyon  
Centre Hospitalier de Mulhouse – Service MPR*

# Management

Kyphosis : Realisation of the plastered brace with an Abbott's frame



14/02/2010

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Lyon antikyphosis brace

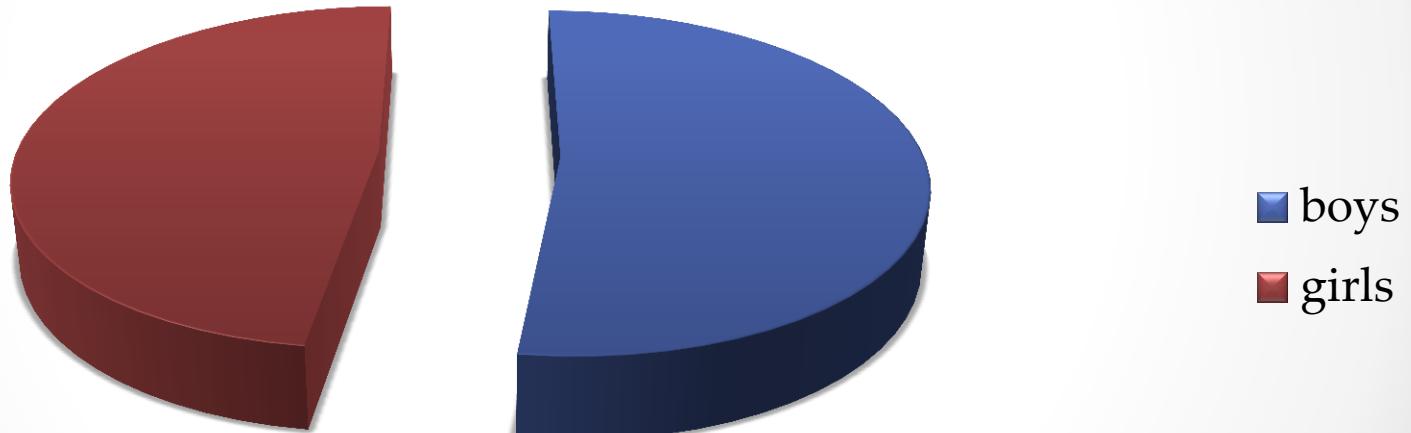
- Plaster cast 1-2 months

Plexidur bivalve antikyphosis Lyon Brace



# Material & Methods

272 patients

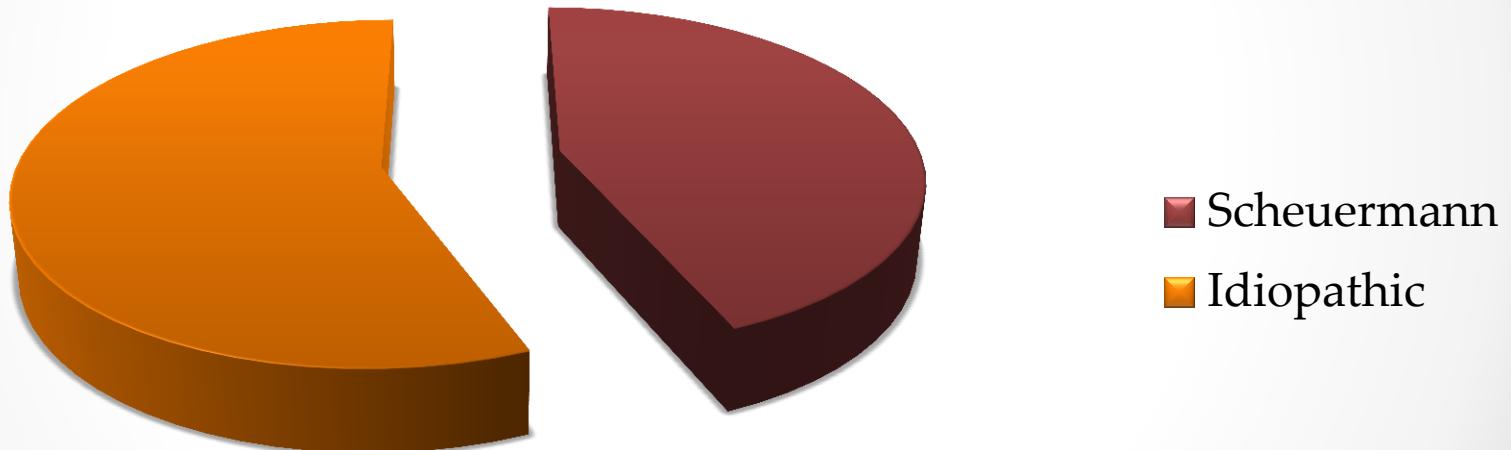


average age of 13.6 months

reviewed 2 years after removal of the brace

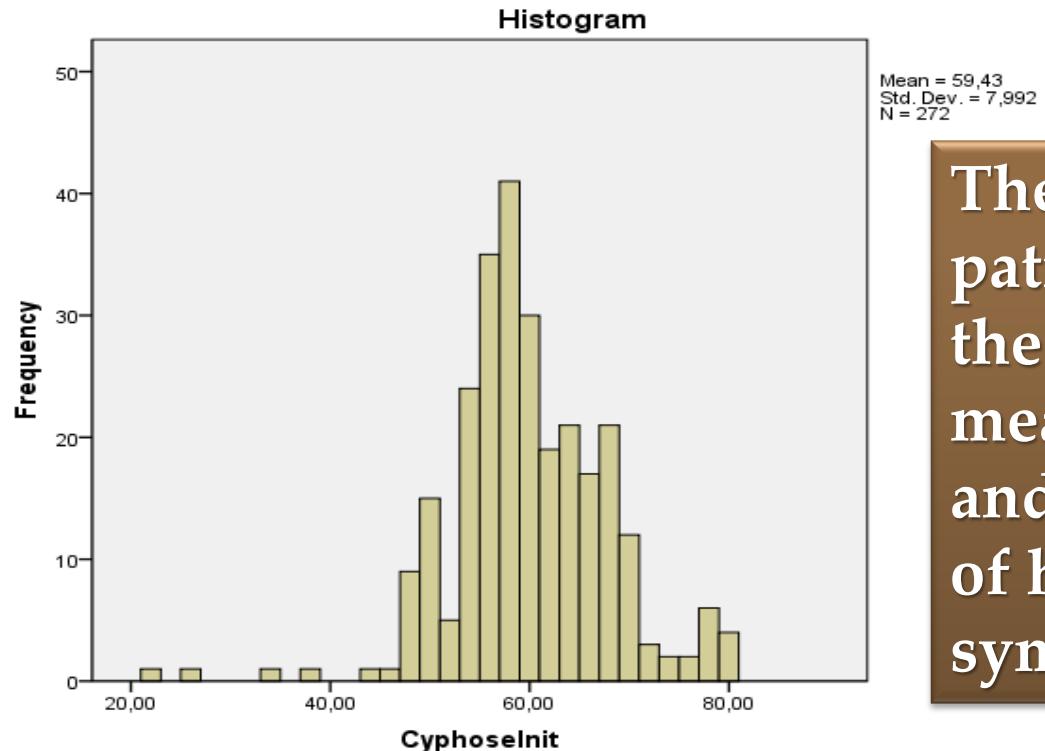
# Material & Methods

## Diagnostic

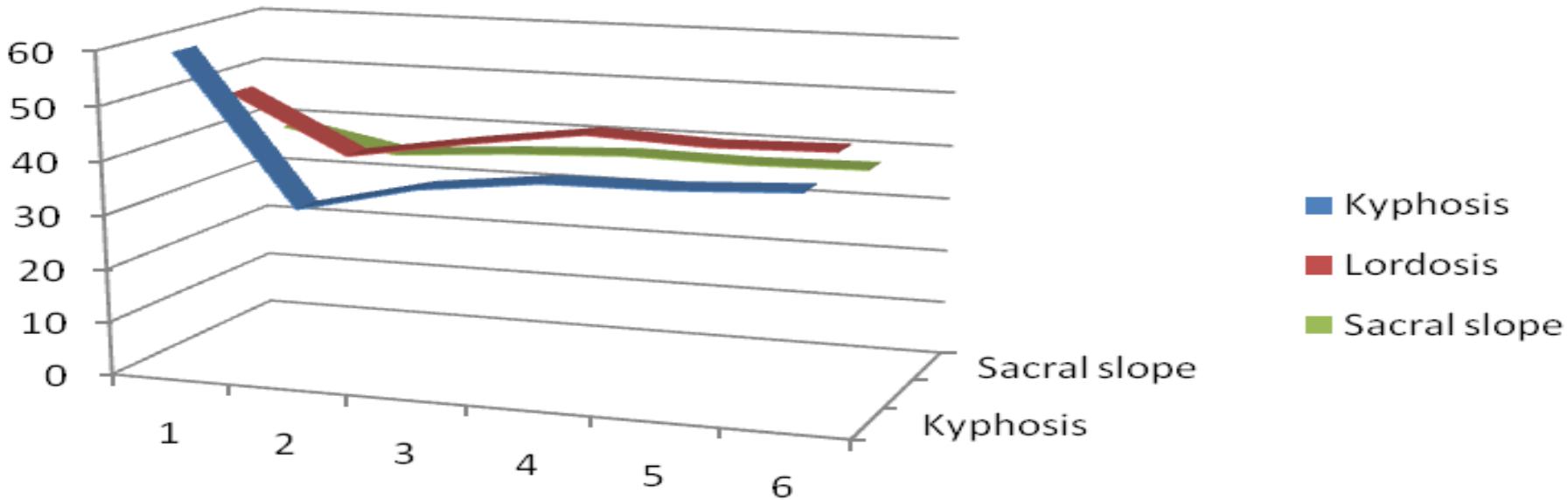


10 cases of thoraco-lumbar pattern

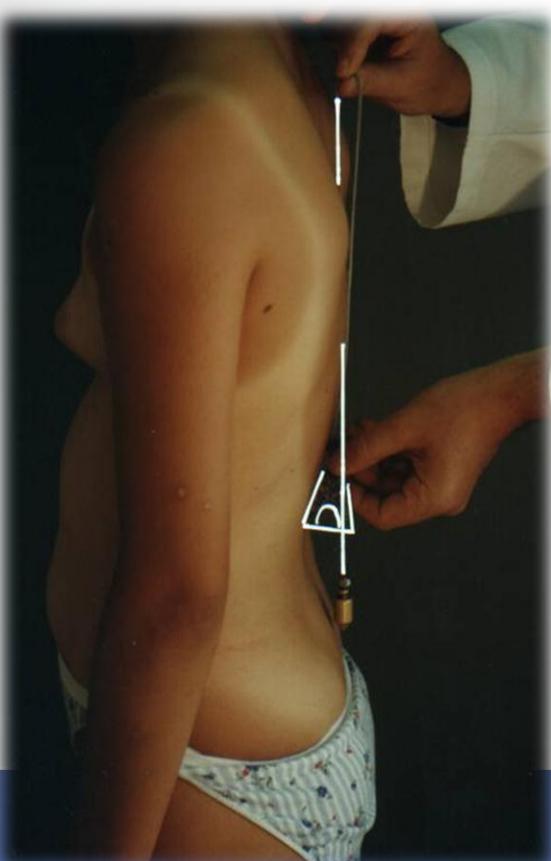
# Results: Distribution of the initial Stagnara angle



The distribution of the patients follows the laws of the normality with identical mean (59,43), mode (57,00), and median (59,00), the curve of histograms being symmetric.



	Initial	In Plaster	in brace	1 year	Removal	Removal + 2 years
Kyphosis	59,43	32,09	37,12	39,58	39,78	40,84 (31%)
Lordosis	48,90	38,21	41,76	44,71	43,74	44,20 (10%)
Sacral slope	39,13	34,89	36,36	37,26	36,89	37,27 (5%)



Arrow Kyp / Cobb Kyp init	0,322		significant at the 0,01 level (2-tailed)
Table 3: Correlation between the measure of the clinical arrows and the radiological angulation			

# Correlations between Scheuermann, sex, pain and thoraco-lumbar localization

Our statistics contains 142 males and 130 females.

Males present:

- more Scheuermann' disease.

116 patients present a Scheuermann's disease with more pain (126/140 cases)

- and thoraco-lumbar localization (8/10 cases).

<b>Sex / Etiology</b>	<b>0,194</b>	significant at the 0,01 level (2-tailed)
<b>Etiology / TL</b>	<b>-0,177</b>	significant at the 0,05 level (2-tailed 0,034)
<b>Etiology / Pain</b>	<b>0,142</b>	significant at the 0,05 level (2-tailed)

Table 4: Correlations between Scheuermann, sex, pain and thoraco-lumbar localization

# Study of the correlations influencing the final angular correction

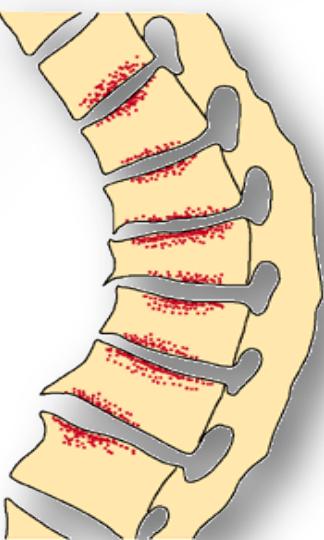
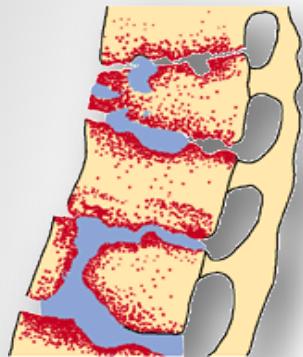
We shall present the significant results according to the value of the Pearson's correlation coefficient. The immediate reduction in plaster cast is an excellent predictive criterion of the final correction.

<b>Cobb Kyp plaster / Cobb Rem + 2</b>	<b>0,536</b>	significant at the 0,01 level (2-tailed)
<b>Plaster cast correction / Final Cobb</b>	<b>0,497</b>	significant at the 0,01 level (2-tailed)
<b>Cobb Kyp init/Cobb correction</b>	<b>0,455</b>	significant at the 0,01 level (2-tailed)

Table 5: Most significant correlations with the final result.



Cobb Kyp plaster / in brace	0,476		significant at the 0,01 level (2-tailed)
Table 7: Correlation between the reduction in plaster cast and bivalve plexidur brace			



<b>Height/Cobb K Correction</b>	-0,115	non significant : sig, (2-tailed 0,057)
<b>Weight / Cobb K Correction</b>	-0,039	non significant : sig, (2-tailed 0,518)
<b>Sex/Cobb K Correction</b>	0,043	non significant : sig, (2-tailed 0,480)
<b>Pain / Cobb K Correction</b>	0,026	non significant : sig, (2-tailed 0,676)
<b>Aetiology / Cobb K Correction</b>	-0,039	non significant : sig, (2-tailed 0,521)
<b>Tight Hamstrings/ Cobb K Correction</b>	0,034	non significant : sig, (2-tailed 0,585)
<b>Lord init / Cobb K Correction</b>	0,007	non significant : sig, (2-tailed 0,914)

Table 6: Non significant parameters

Table I. — Percentage improvement in kyphosis  
 (difference between initial and final angular deformity)  
 according to type of treatment (200 cases)

	Group 1 : Exercises	Group 2 : Brace	Group 3 : Cast + Brace	Group 4 : Exercises, then Brace
Mean % improv.	17.55%	25.21%	30.88%	23.47%
Standard dev.	19.19%	19.17%	17.62%	20.06%
Maximum	58.00%	59.67%	71.79%	60.65%
Minimum	-44.44%	-41.46%	-15.25%	-10.20%
Cases (n)	76	45	51	28
$F_{exp} = 5.21 ; (3 ; 196) \text{ df} ; P < 0.005$ (significant)				

Our correction percentage: 31 %

# CONCLUSION

Bien que rétrospective, cette étude est puissante, car elle concerne un protocole “historique” qui n'a pas été modifié depuis 60 ans. La cohérence avec d'autres études publiées notamment en Espagne est parfaite. Les résultats sont meilleurs que pour les scolioses avec la possibilité de restaurer des courbures quasi physiologiques dans le plan sagittal.



Merci pour votre attention