

Self Lengthening devices

How , When and Why ?

Disclosures

- **Designer of Variable Axis Connector**
 - **No Royalties**



The Phenix Rod



Ian Torode
Royal Children's Hospital
Melbourne, Australia

The Phenix Family.....



Paris

Malmo
Sweden

Zurich
Switzerland

Montpellier
France

Grenoble
France

Portland
Oregon



Melbourne
Australia



Meilleurs Vœux 2009



Arnaud Soubeiran

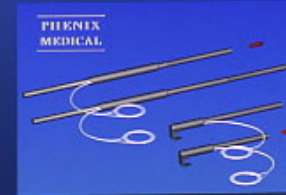


Jean Dubousset

Superb intellect plus talented orthoped and engineer

Radio controlled expandable Spine Rod

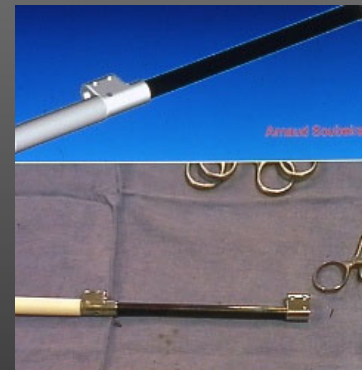
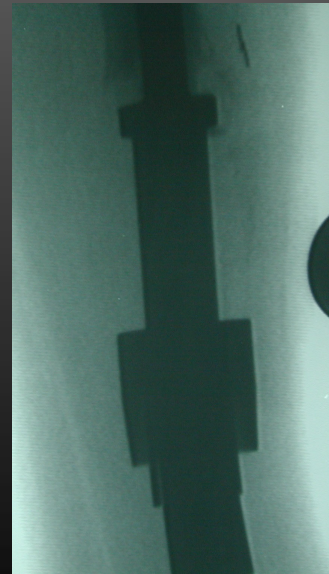
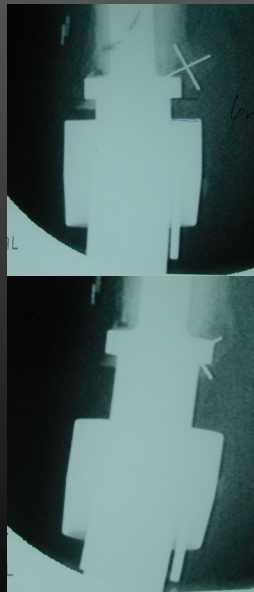
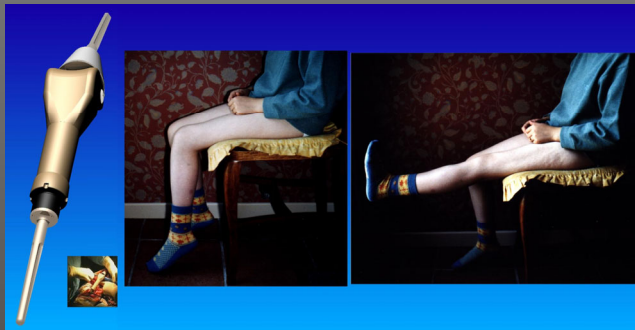
1996: Early Design and Animal Experimentation



**Springs
+ plastic tube
+ electrical
induced
heated wire**

Radio controlled expandable prosthesis for malignant tumors

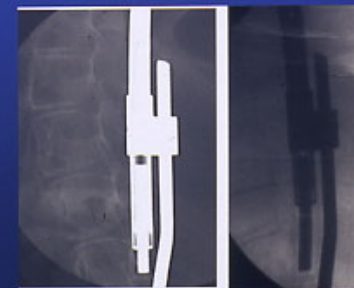
1993



1997: Final Design and First Patient



**Radiocontrolled Expansions :
Spine Rod**





- **Current Device**

- **Version 3**

- Two driven rods
 - 5 rev's per mm each rod
 - Two way device
 - Each rod can deliver 4+ cm.
 - Total capacity depends on design
 - Cylindrical driving magnet
-
- To date more reliable,
efficient, more user friendly.



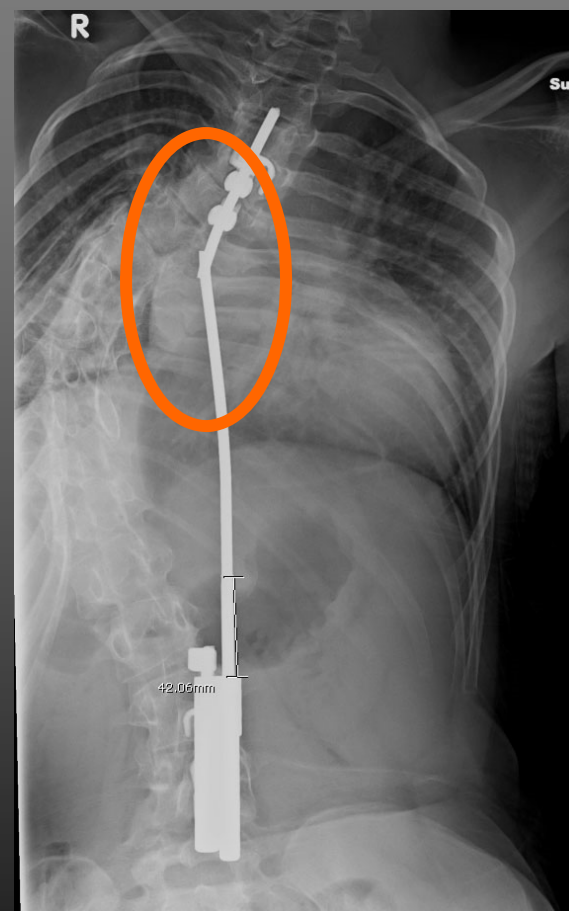
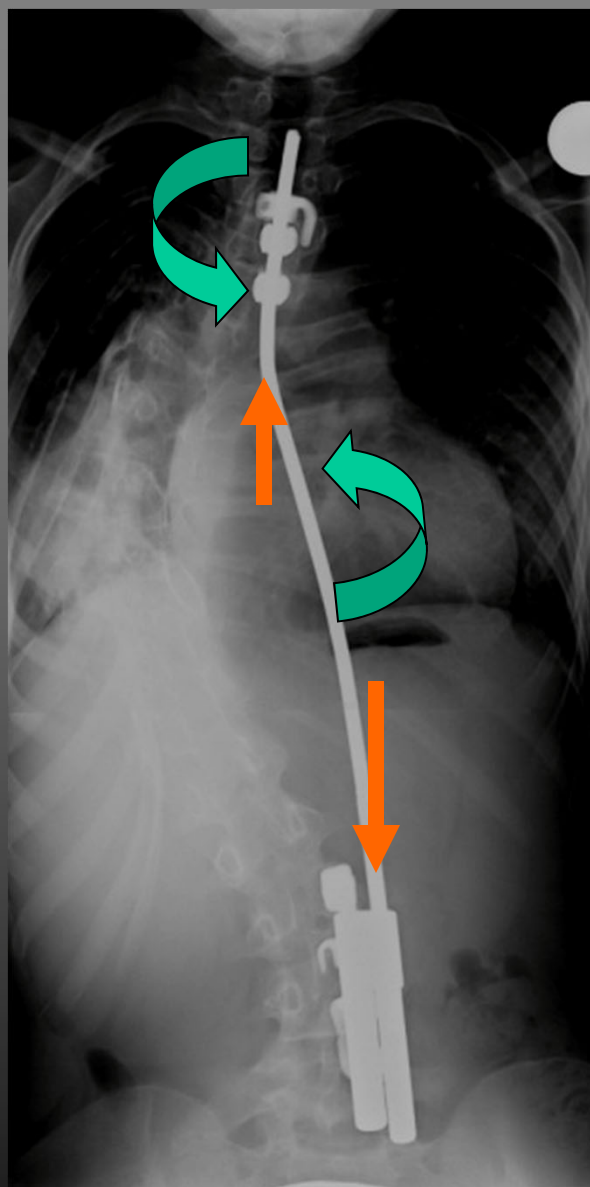
Phenix – How ?

Phenix – How ?

- **Fact**
 - Highly likely any segment of the spine covered by a rod will become stiff.
- **Therefore aim to fix only the primary curve.**
 - i.e. one curve = one rod
 - Do not want dollar signs
 - Do not want double rods

Phenix – How?

- **Fact:**
 - **Rigid fixation of a rod to the unfused spine is likely to lead to failure of the fixation or failure of the rod.**
 - i.e. Hook pullout or screw ploughing
 - Or rod fracture

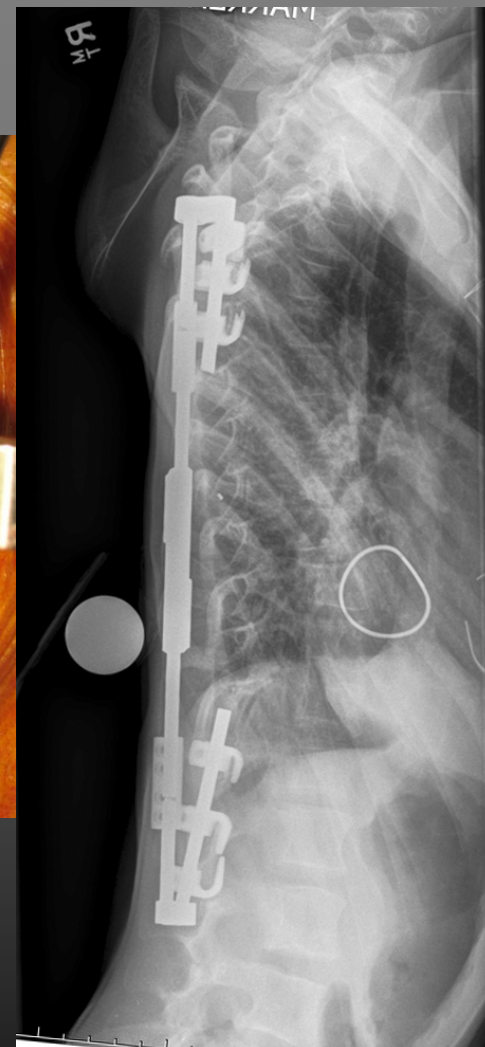
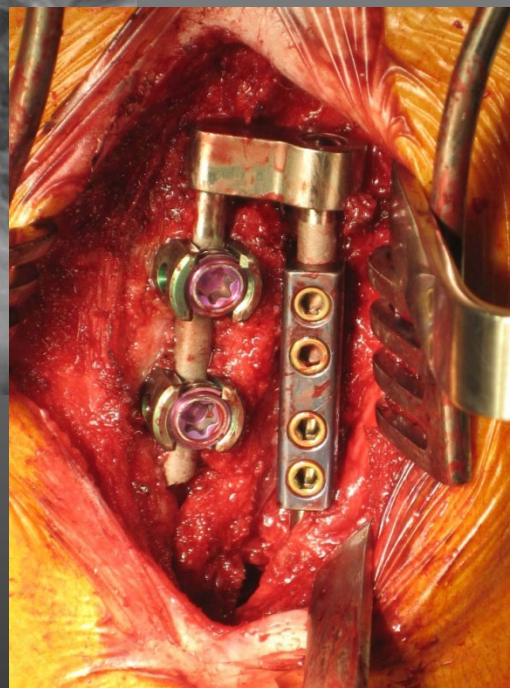
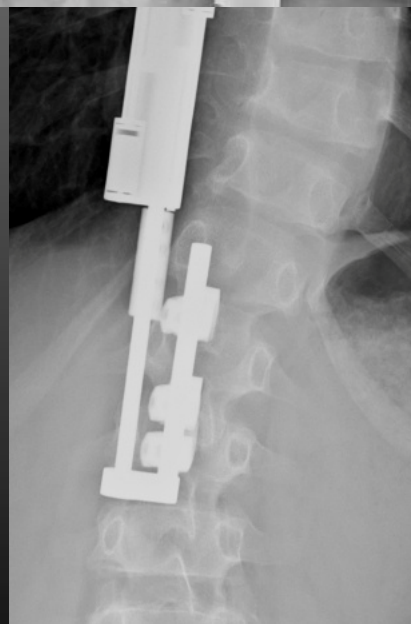
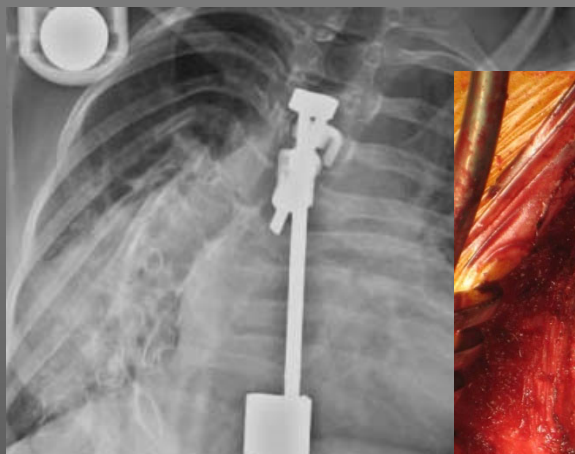
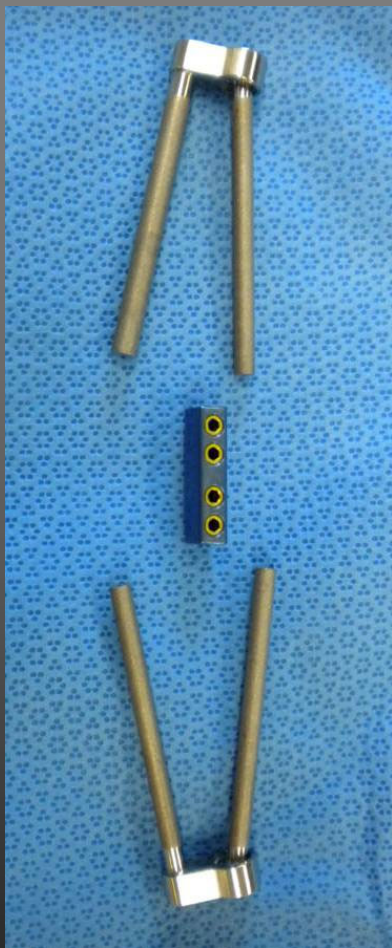


+45mm 18m.

Phenix – How?

- The answer is to build in flexibility or stress relief, not an increase in strength via double rods or thicker rods

Mobile Connector



Set up in “pull” mode.



Patient of Acke Ohlin, Sweden.

Phenix – How?

- **Fact:**
 - With time and growth the resistance to distraction increases.
- It makes no sense to distract intermittently i.e. at 6 monthly intervals
- Regular daily applications of the magnet are to be recommended



Phenix – When?

- **When?**
 - **When in treatment plan?**
 - **Age?**
 - **Size of Curve?**

Phenix – When?

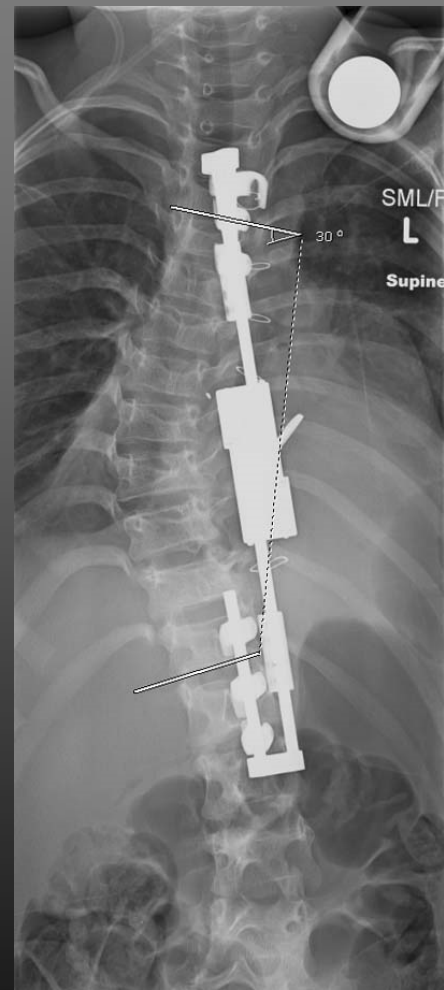
- When in the treatment plan?
- For some, it will be after casts or bracing have failed to achieve the goal at onset.

Phenix – When?

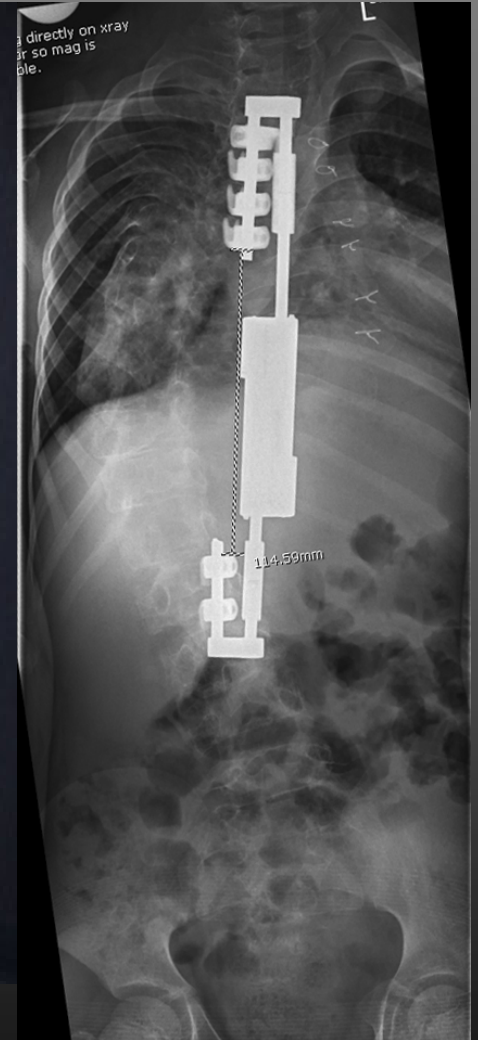
- When in the treatment plan?
- For others casts or braces may be contraindicated



Marfan's

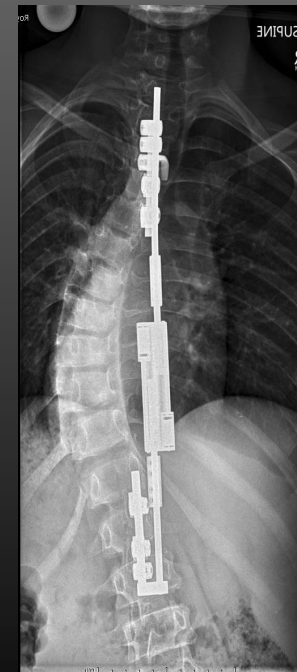
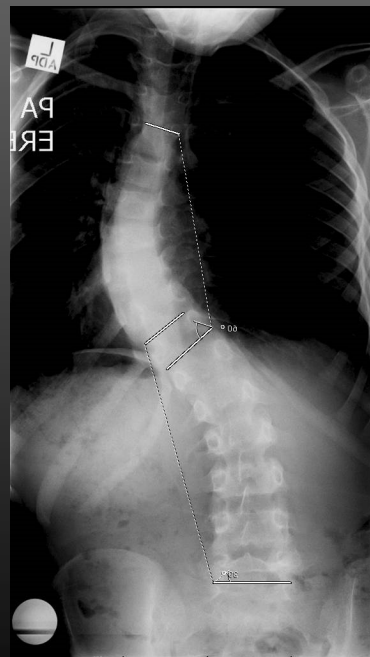
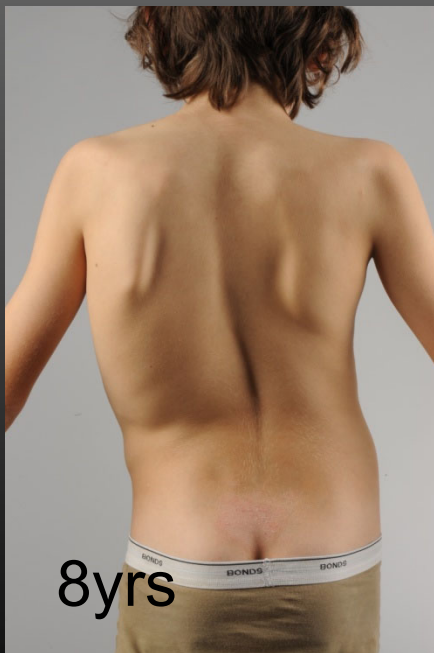


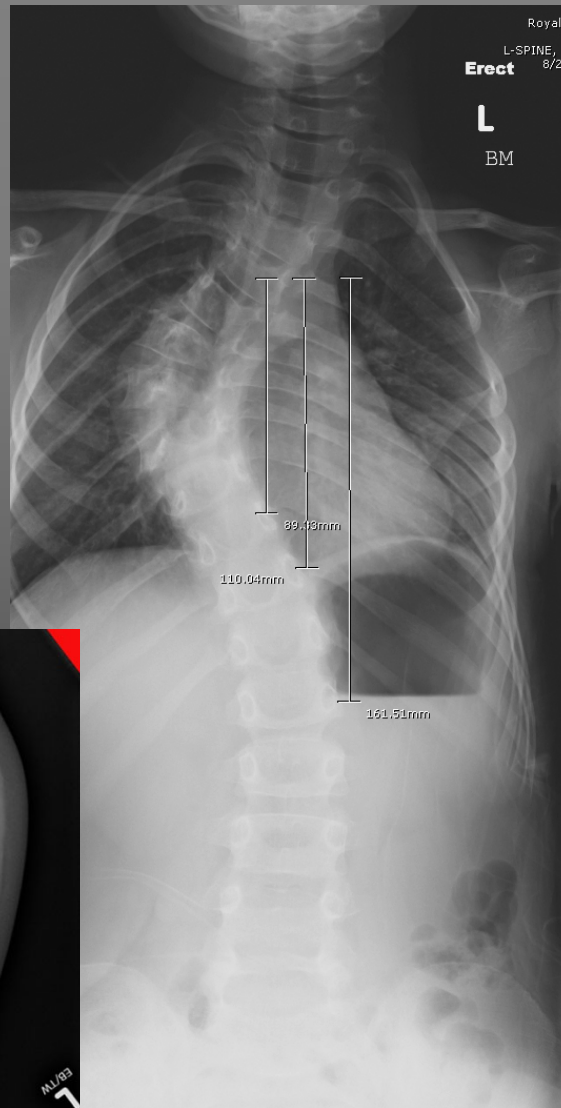
Phenix – When?



Phenix – When?

- Age? - could also add size
- Most are over 6 years to allow implantation with a 4.5mm Phenix and using 4.5 system hooks or screws

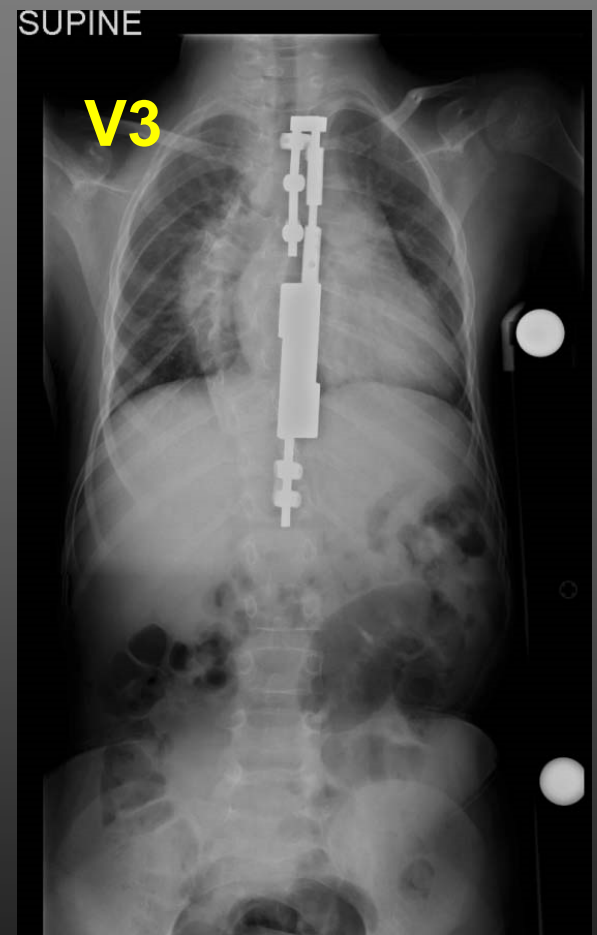
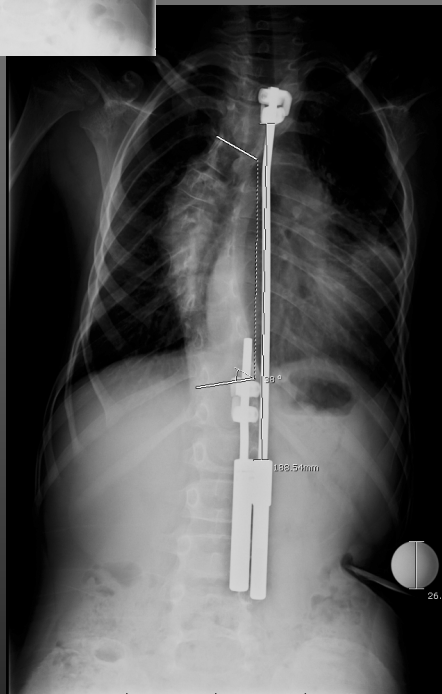
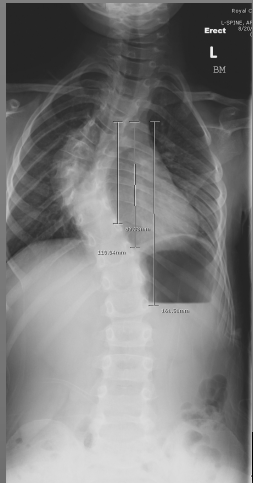




7yrs NF1



MF



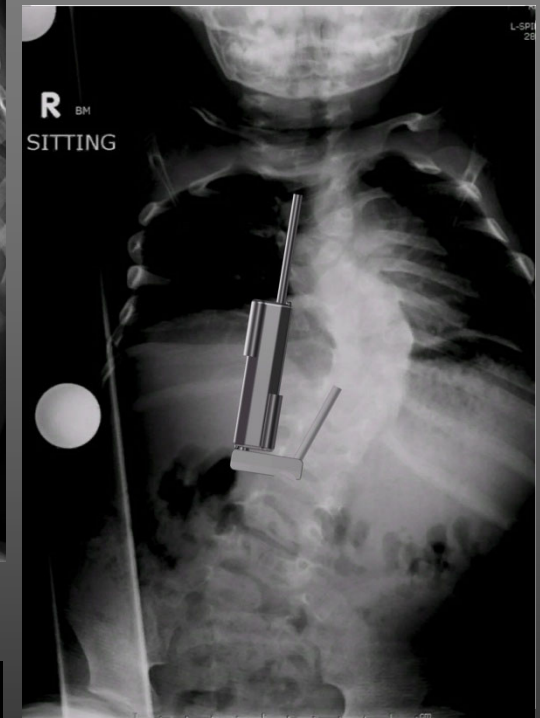
45mm in 8m.

Total length to date = 65mm

MF

Phenix – When?

- Age?



3.5mm.
Plus Cx. screws

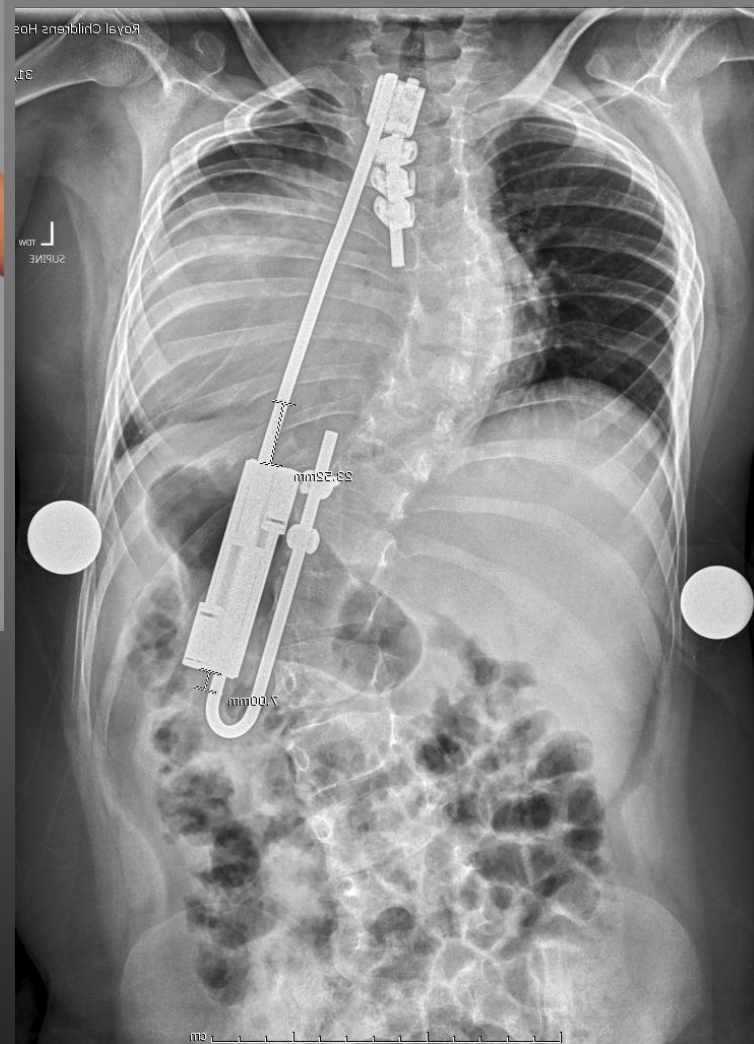
Phenix - Why ?

- Why I have chosen the Phenix?
 - Customised to the patients' needs and size.

110cm.

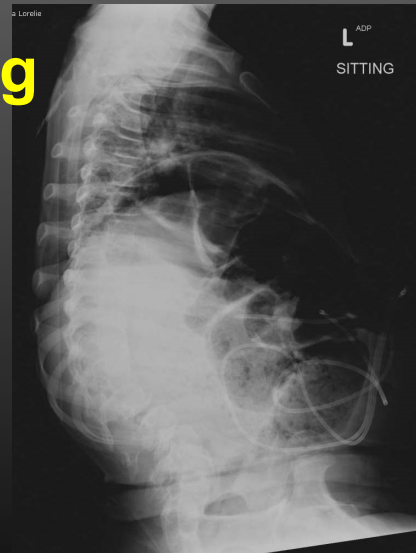
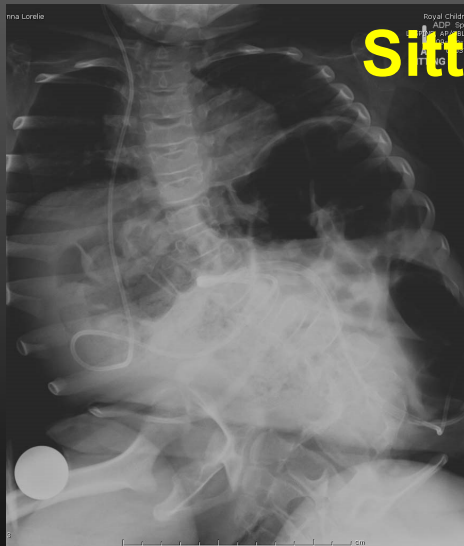


10yrs





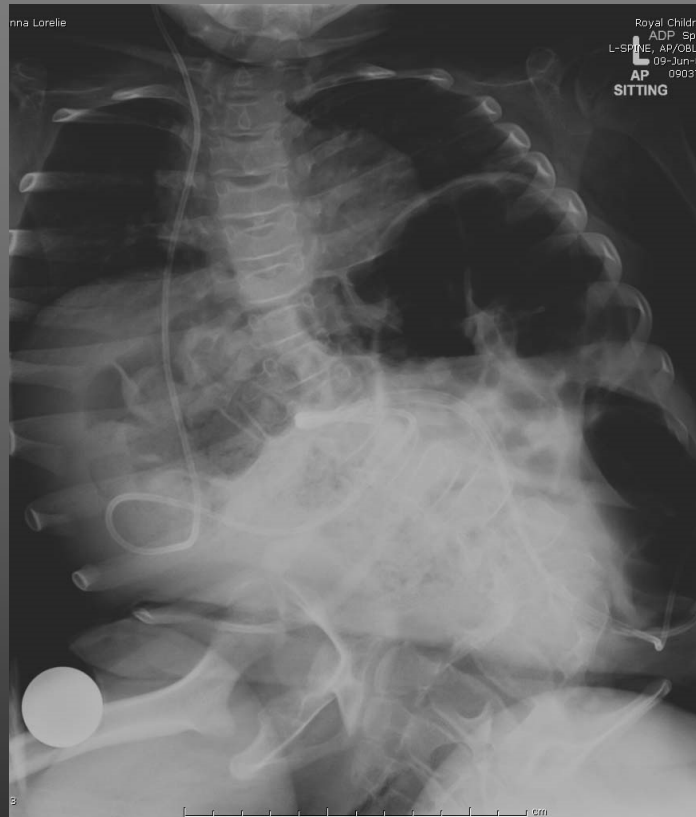
**Spina Bifida
9y9m**



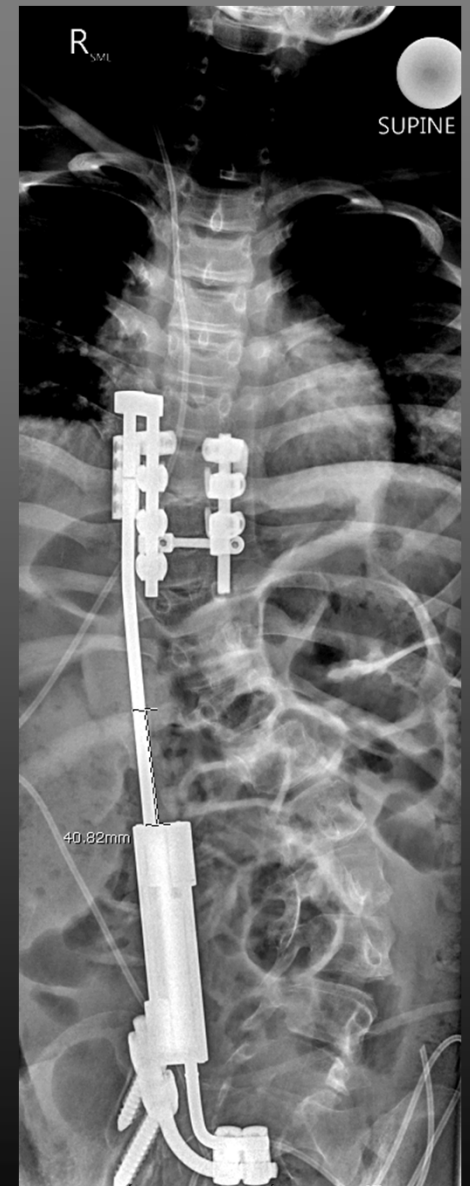
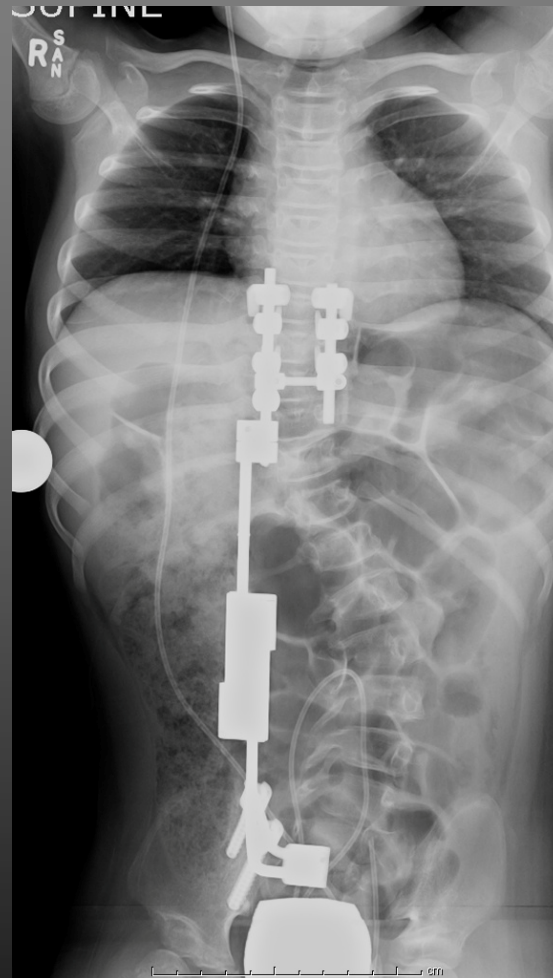
Sitting

HH

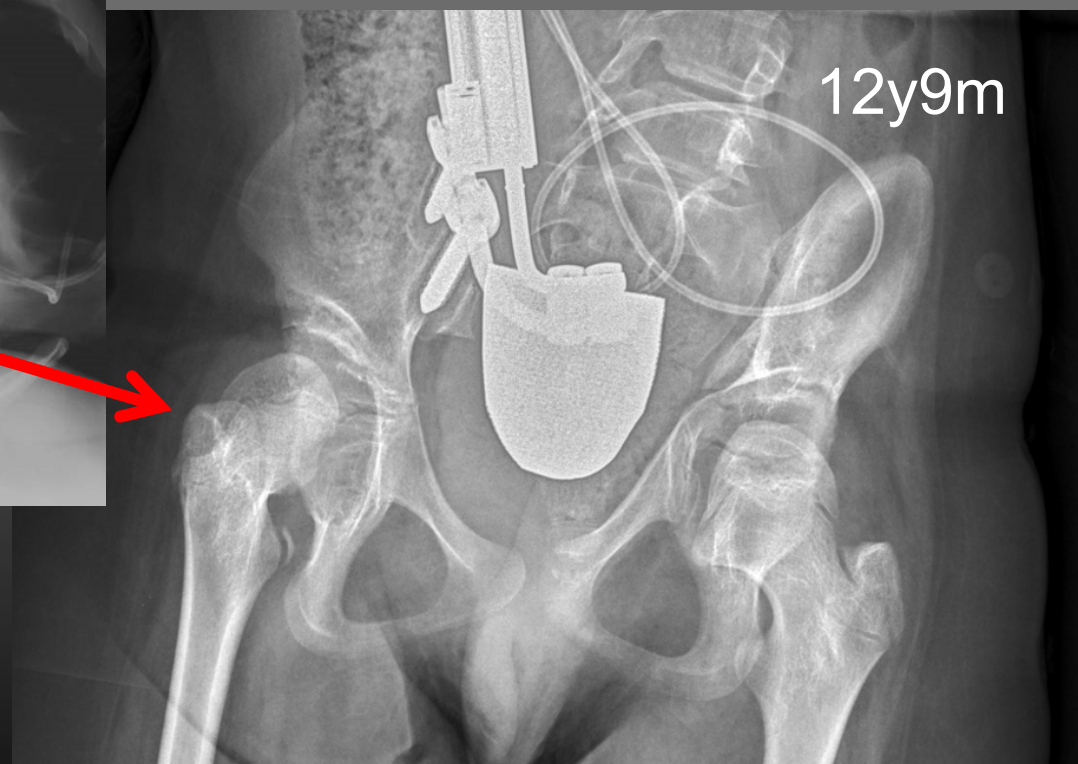
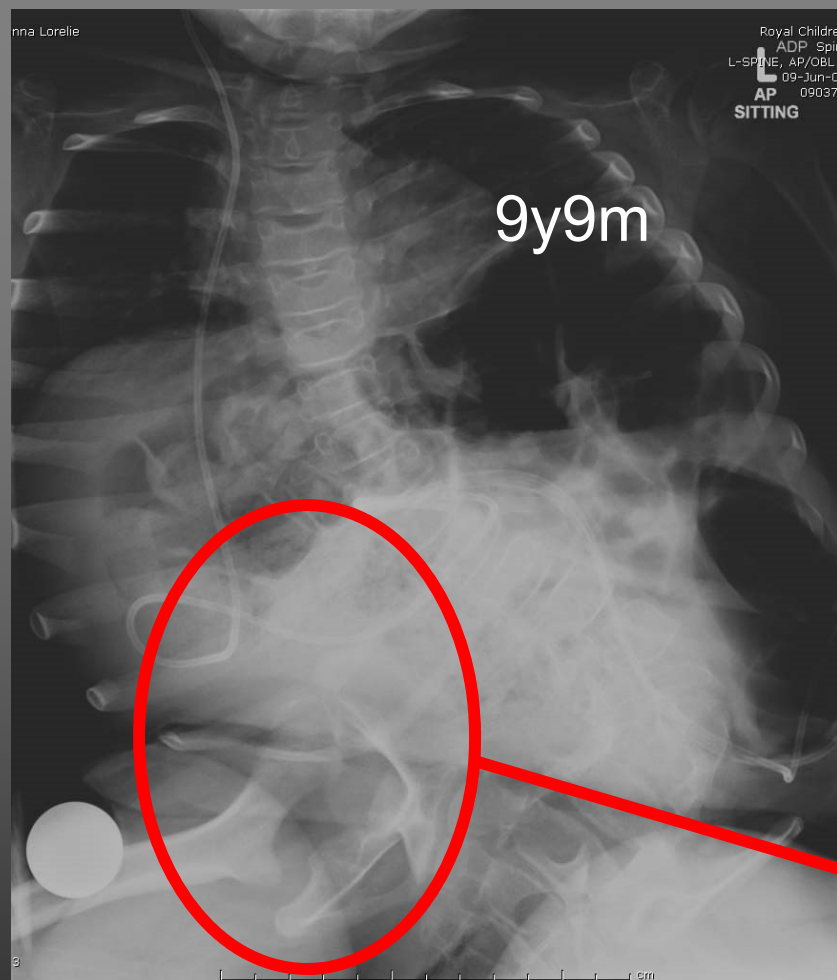
9y9m

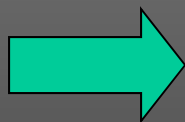


12y9m



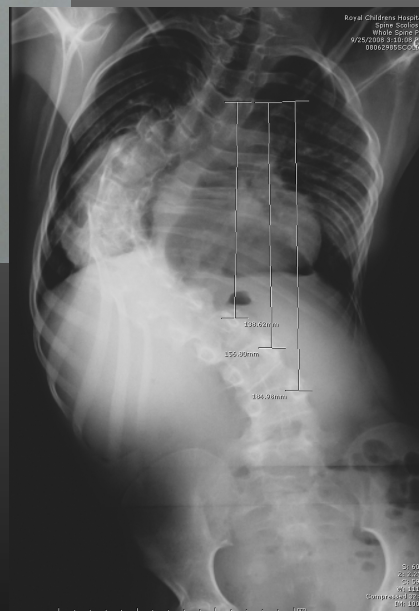
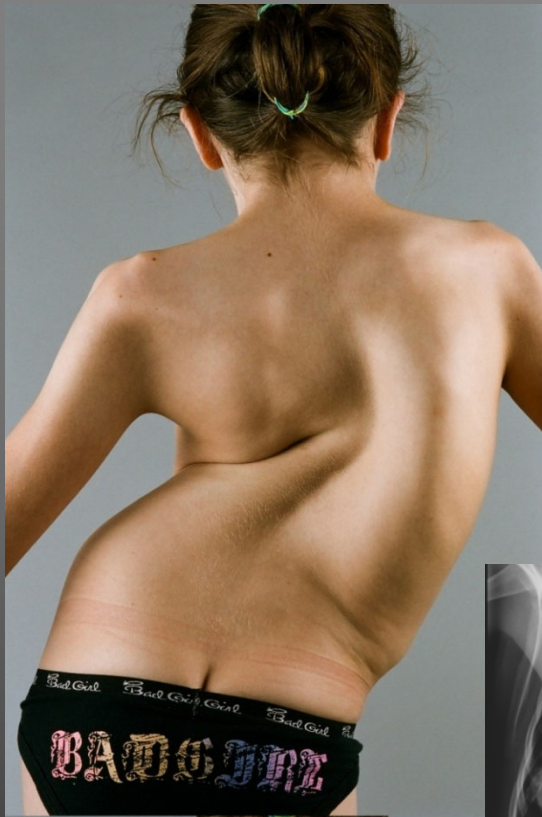
Total Gain to Date 90mm





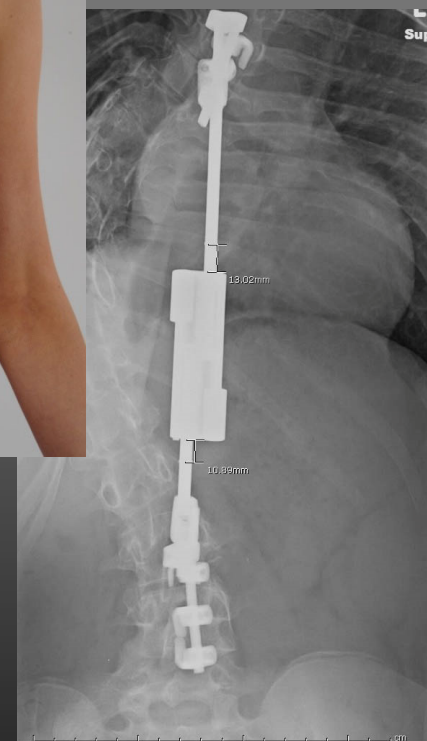
Phenix - Why ?

- Why I have chosen the Phenix?
 - Customised to the patients' needs and size.
 - Driven by parents
 - Daily lengthening
 - involvement important



11 yrs

TN



14y4m +23mm

Total to date 80mm

Phenix - Why ?

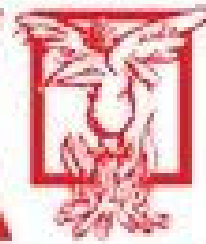
- Why I have chosen the Phenix?
 - Customised to the patients' needs and size.
 - Driven by parents
 - Daily lengthening
 - involvement important
 - Feedback with the lengthening

The Phenix Philosophy

- Aims:
 - To correct deformity
 - Avoid repeated operations
 - Constant correction - allow growth to modify deformities
 - Instrument only the primary curve i.e. avoid top to bottom instrumentations
 - Parent lengthening – ie ownership



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€2.85 (incl. VAT) (standing €3.50)



Ireland is a
special case

Ja, for
sure

... a basket
case!

Dr. Wolfgang Schäuble
Federal Minister of
Finance

Thankyou