New Technology Adoption: Considerations and Implementation Strategies

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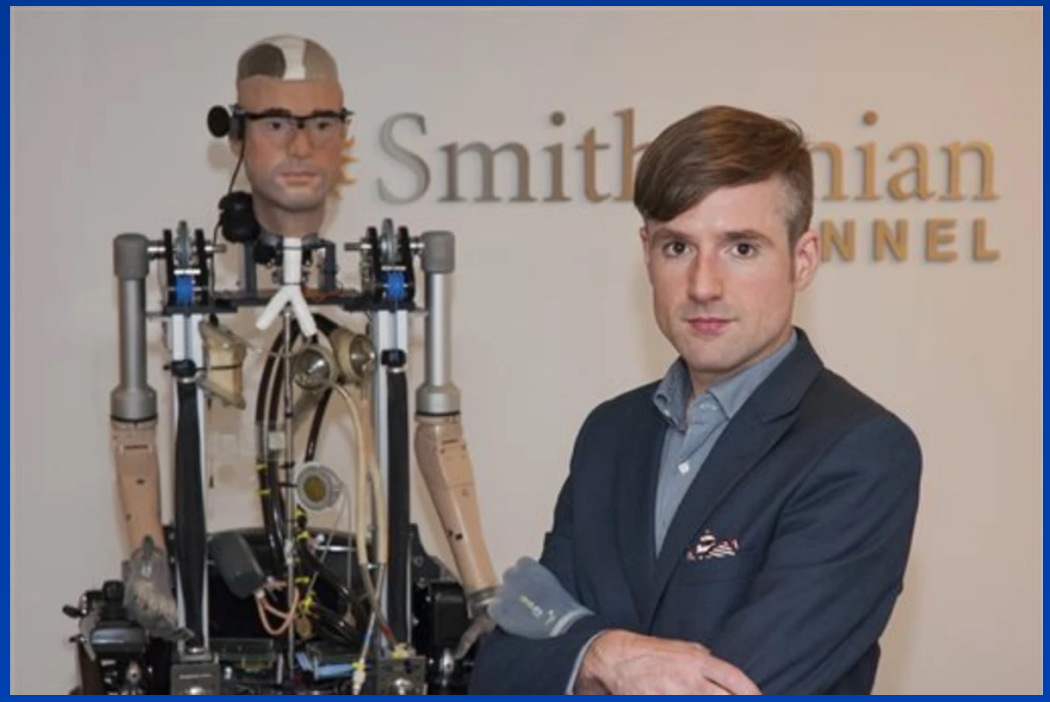
Disclosures

- None related to this talk
- Speaker:
  - Depuy Synthes
  - Nuvasive Spine
  - Orthopediatrics
  - Stryker Spine
  - Zimmer Spine
- Advisory board:
  - Depuy Synthes
  - Nuvasive Spine
  - Stryker Spine
  - Zimmer Biomet
  - Astrozenica
- Member:
  - SRS
  - POSNA
  - PSSG
- Grant Recipient:
  - POSNA
  - Shriners Hospital for Children
  - Zimmer Biomet

Objectives

- Delineate strategies for new technique adoption
- Identify safe risk parameters
- Identifying different educational resources for new technology adoption



First identify a problem

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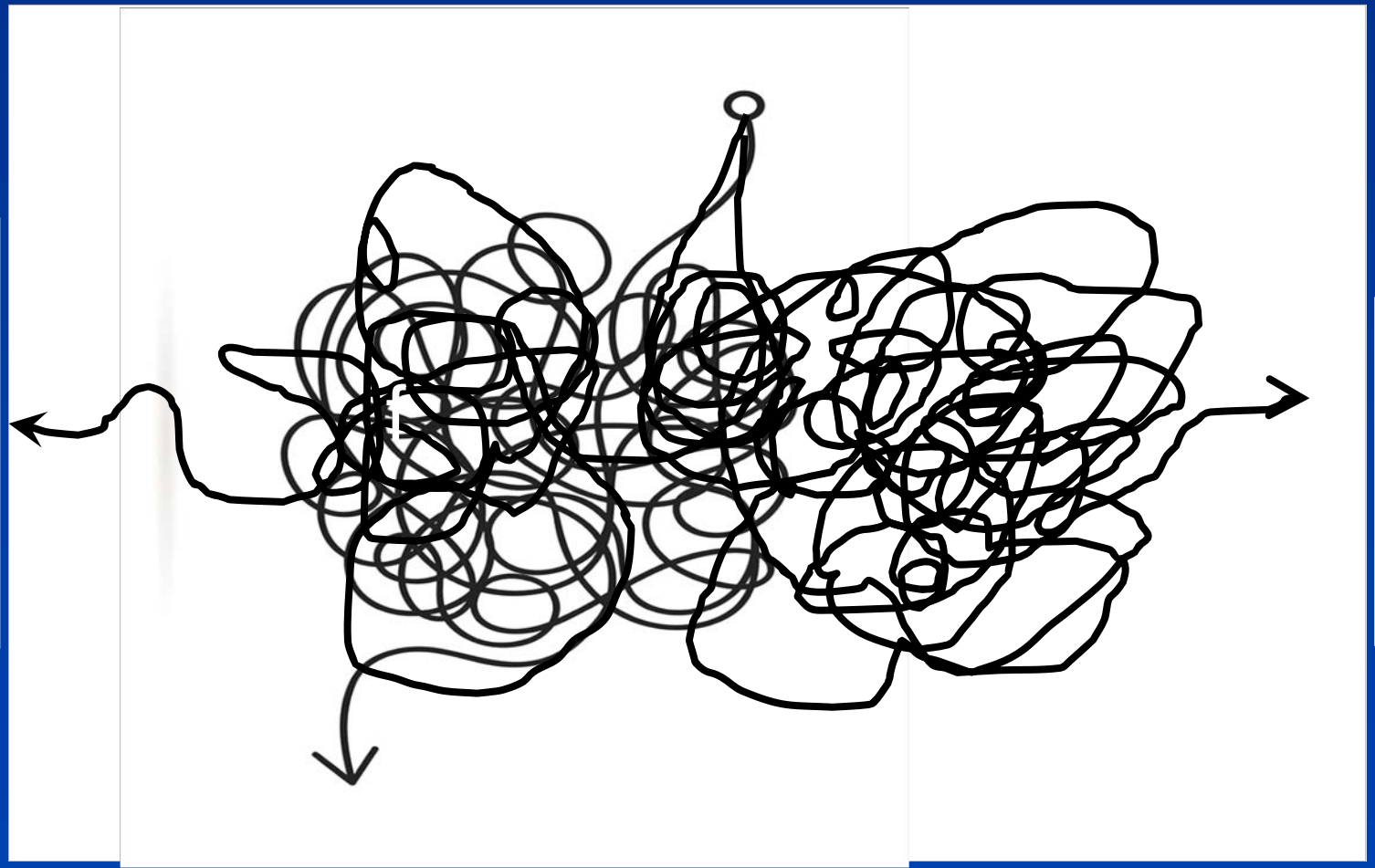
The Problem

There is an established answer but its new to you



There is no answer but you have an idea!

There is a novel technique that may be the answer

Background | **Develop it:** | **Fund it** | **Execute it** | **Share results** | Refine it | Bigger funding | Execute on a larger scale

There is a technique that is novel or new to you: Strategies for adoption

- Go to labs to learn techniques
  - Visit respected surgeons to learn
  - Critical self assessment
- Continued self assessment:
  - Review your own outcomes
  - Have others review your outcomes
  - Is your learning curve appropriate?

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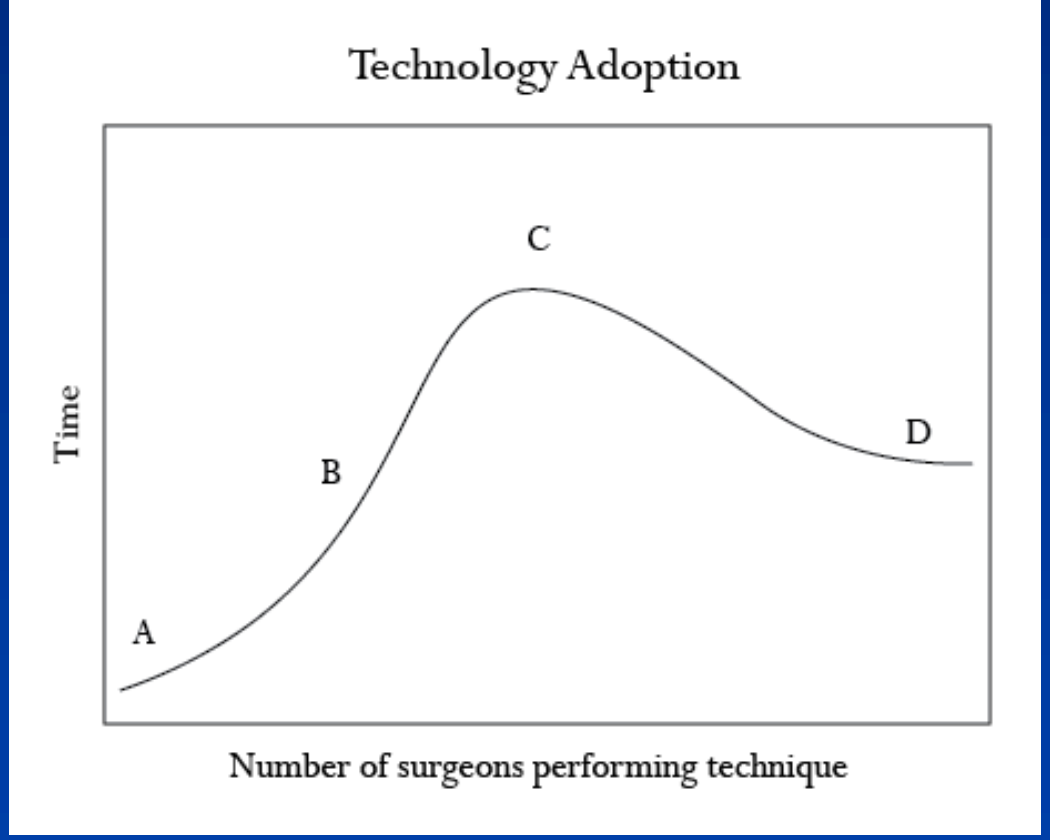
Know Thyself

- Where do you want to be on the learning curve? What risks are you willing to take? Is it right and is it right in your hands?
  A. Are you an alpha release kind of person (cutting edge kinda person)
  B. A beta release (copy cat)
  C. Go with the flow (I'll adopt it when its standard of care)
  D. Resistant to changes (I need proof)



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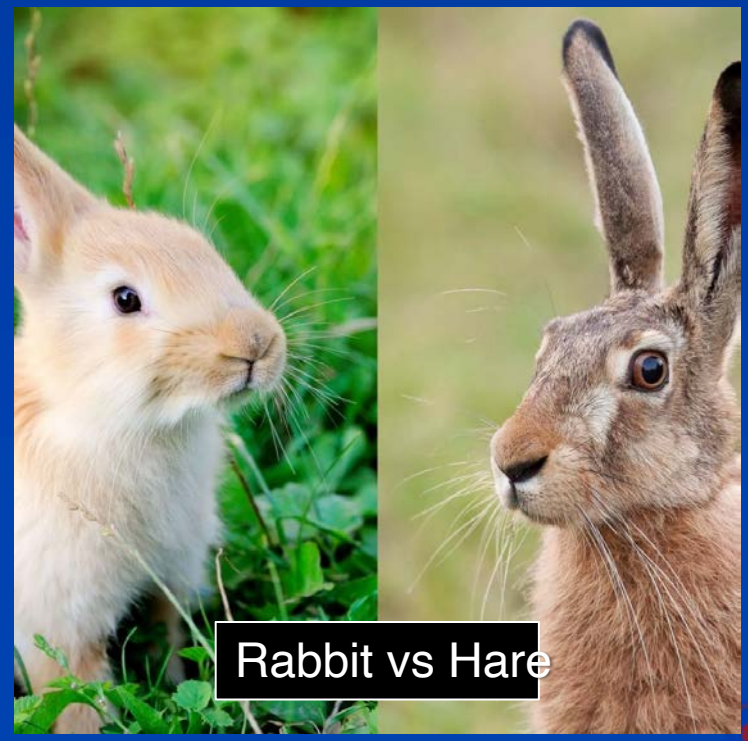
Know thy resources

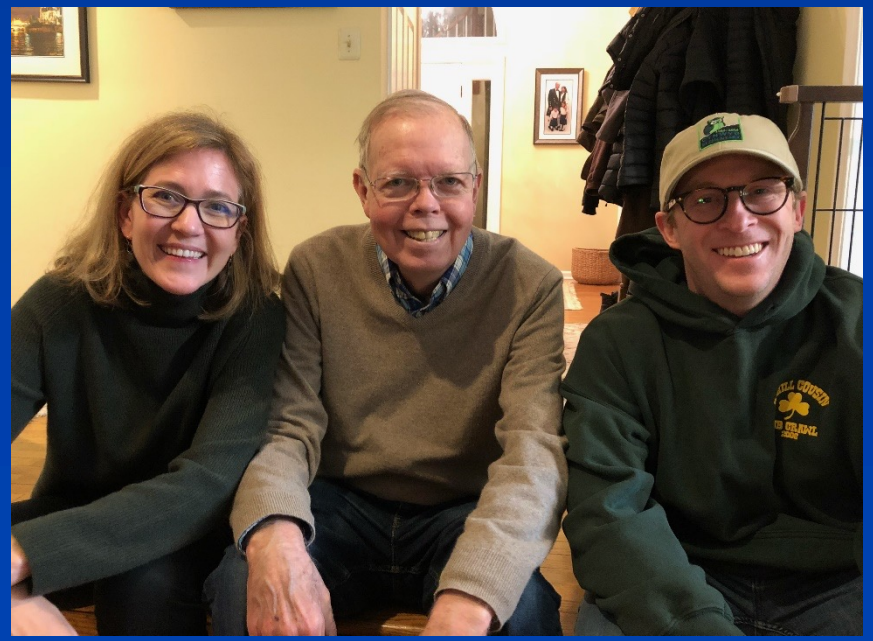
- **Where do you practice?**
  - Does your institution have lots of resources
  - Are you in solo practice or a more rural setting
- **How different is it from what you are currently doing?**
  - A little different
  - A lot different



So you have an idea: Innovating safely

Learn from others

- Mentors
- CHOP FDA / Surgeon Innovation Course: From Napkin Drawing to Patient Care



Be like Peter

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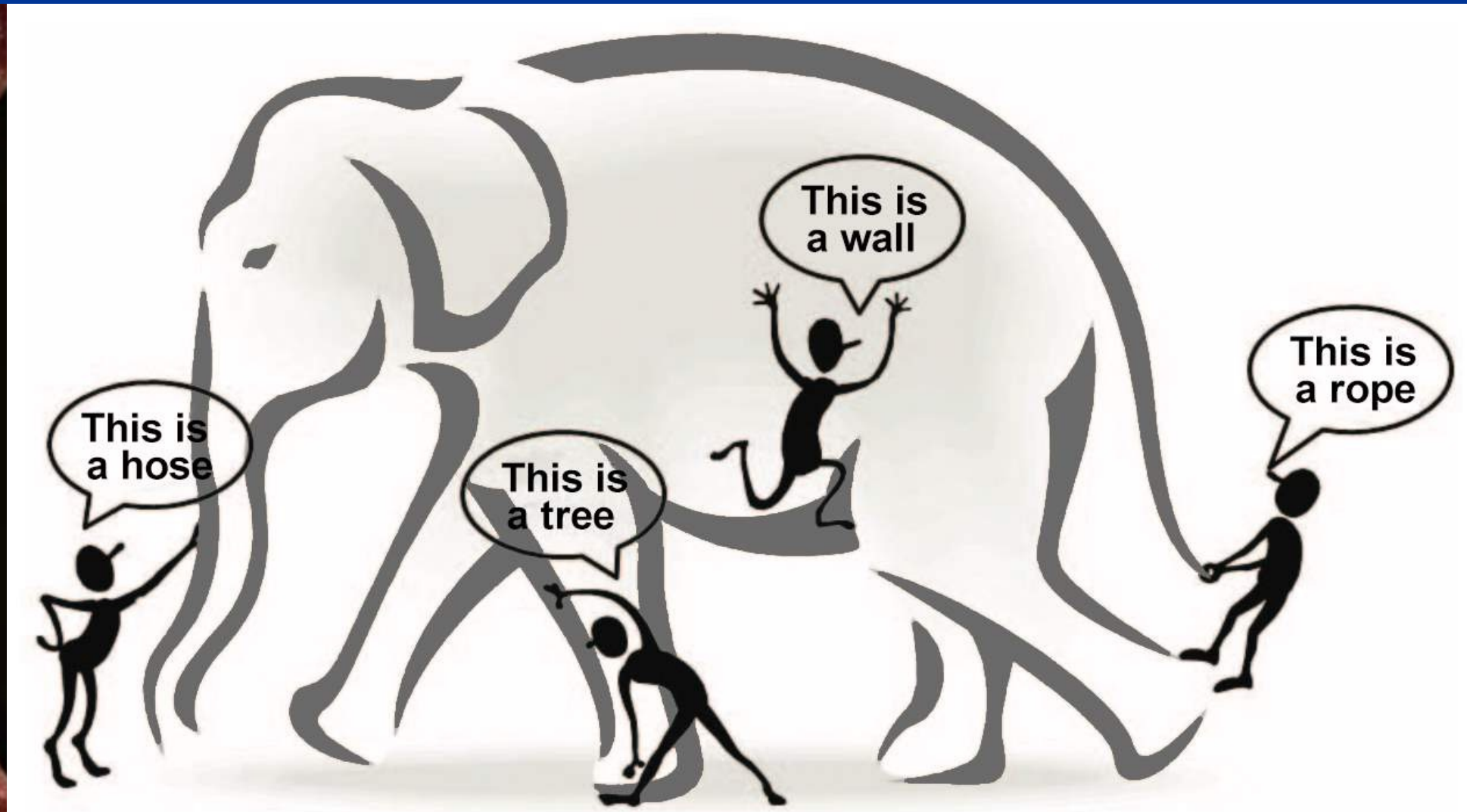
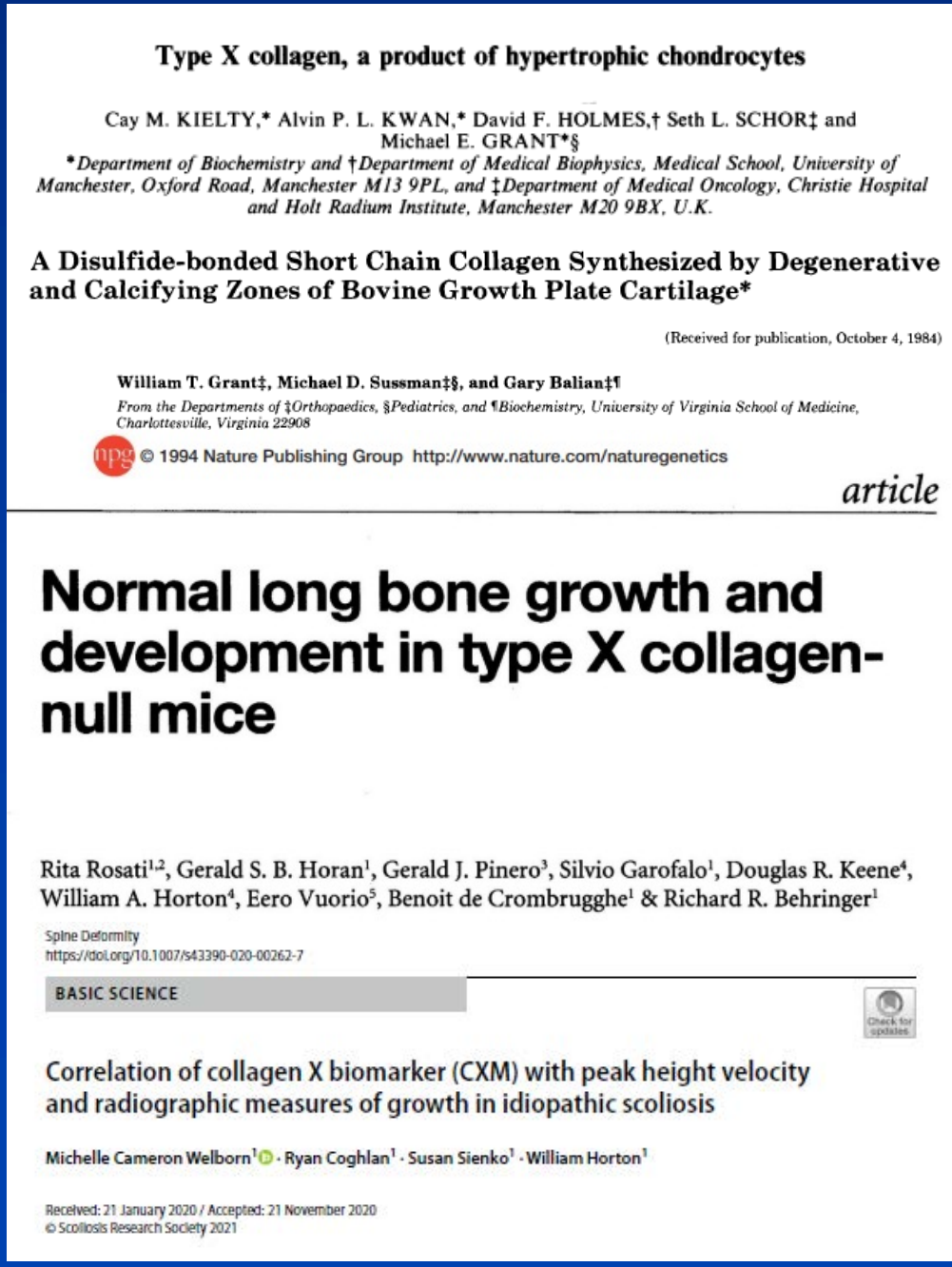
Not all ideas are good ideas

Not all good ideas are well executed



My journey
COLX- The BlISS Study

- The problem- how do bones elongate?
- Identify the components of the physes
  - 1980s
- What is it's role?
  - COLX is produced in the physis during enchondral ossification
- Identify the patient problem –
  - no reliable measure for growth
  - Can CXM predict growth?
  - Is it better than what we are currently doing?



Type X collagen, a product of hypertrophic chondrocytes

Cay M. KIELTY,* Alvin P. L. KWAN,* David F. HOLMES,† Seth L. SCHOR‡ and Michael E. GRANT*§

*Department of Biochemistry and †Department of Medical Biophysics, Medical School, University of Manchester, Oxford Road, Manchester M13 9PL, and ‡Department of Medical Oncology, Christie Hospital and Holt Radium Institute, Manchester M20 9BX, U.K.

A Disulfide-bonded Short Chain Collagen Synthesized by Degenerative and Calcifying Zones of Bovine Growth Plate Cartilage*

(Received for publication, October 4, 1984)

William T. Grant‡, Michael D. Sussman‡§, and Gary Balian‡¶

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article

Normal long bone growth and development in type X collagen-null mice

Rita Rosati[1,2], Gerald S. B. Horan[1], Gerald J. Pinero[3], Silvio Garofalo[1], Douglas R. Keene[4], William A. Horton[4], Eero Vuorio[5], Benoit de Crombrugghe[1] & Richard R. Behringer[1]

Spine Deformity
https://doi.org/10.1007/s43390-020-00262-7

BASIC SCIENCE

Correlation of collagen X biomarker (CXM) with peak height velocity and radiographic measures of growth in idiopathic scoliosis

Michelle Cameron Welborn[1] · Ryan Coghlan[1] · Susan Sienko[1] · William Horton[1]

Received: 21 January 2020 / Accepted: 21 November 2020

How are we doing it?

Friends and Mentors

Research

BIOMARKER
LONGITUDINAL
IDIOPATHIC
SCOLIOSIS
STUDY

Shriners Hospitals
for Children®

Grant funding: wait I have to pay for it?

- Small funds for pilot study to provide data to get larger funds
  - **Microgrants -> Young Investigator** -> Directed Research Grant
- Funding sources:
  - Your own institution
  - National organizations
    - AAOS, AOA, POSNA, SRS, OREF, RJOS, AOA
  - Industry grants
  - Private grants
  - Shriners grants
  - NIH:
    - loan repayment funding
    - k awards – development grants
    - R grants – research grants

Background → Develop it: → **Fund it** → Execute it → **Share results** → Refine it → Bigger funding → Execute on a larger scale

How are we doing it?

Slow and Steady

Start of the BLISS Study

End of the BLISS Study

BIOMARKER LONGITUDINAL IDIOPATHIC SCOLIOSIS STUDY

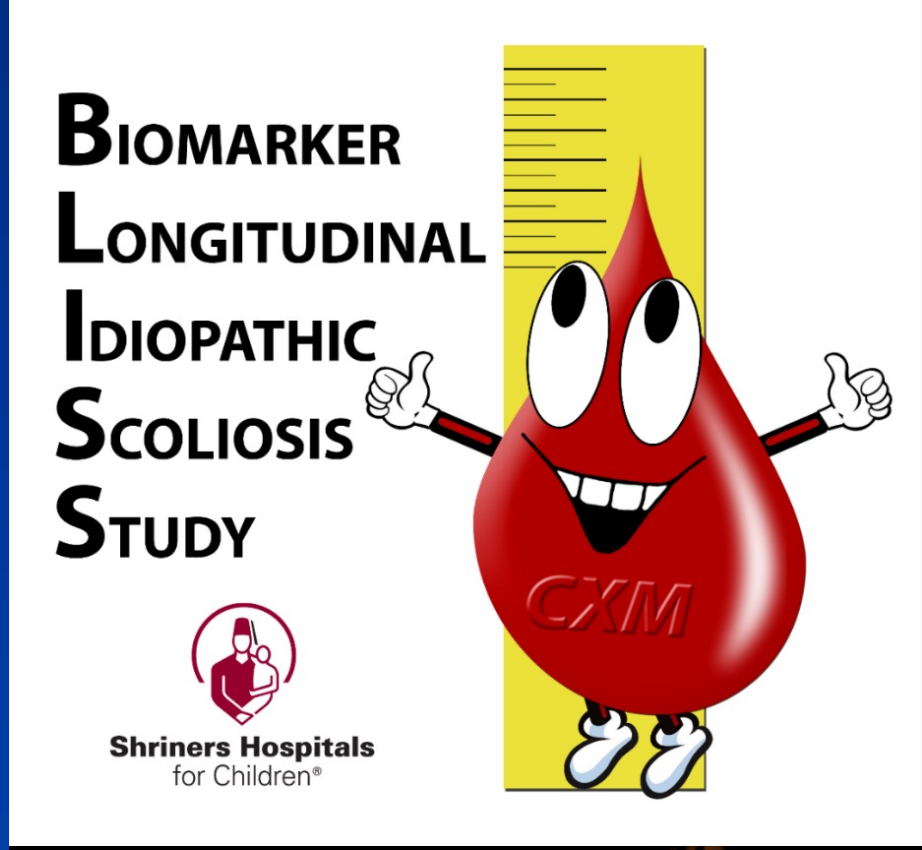
Shriners Hospitals for Children®

Our case:
Following patients through entire growth curve

Background → **Develop it:** → **Fund it** → **Execute it** → **Share results** → Refine it → Bigger funding → Execute on a larger scale

How are we doing it?

- Staying out of trouble- check/recheck
  - Reproducible results!
    - Evaluate all mediums
    - Evaluate for diurnal variation
    - Specimens assayed in quadruplicate
    - Run on multiple plates



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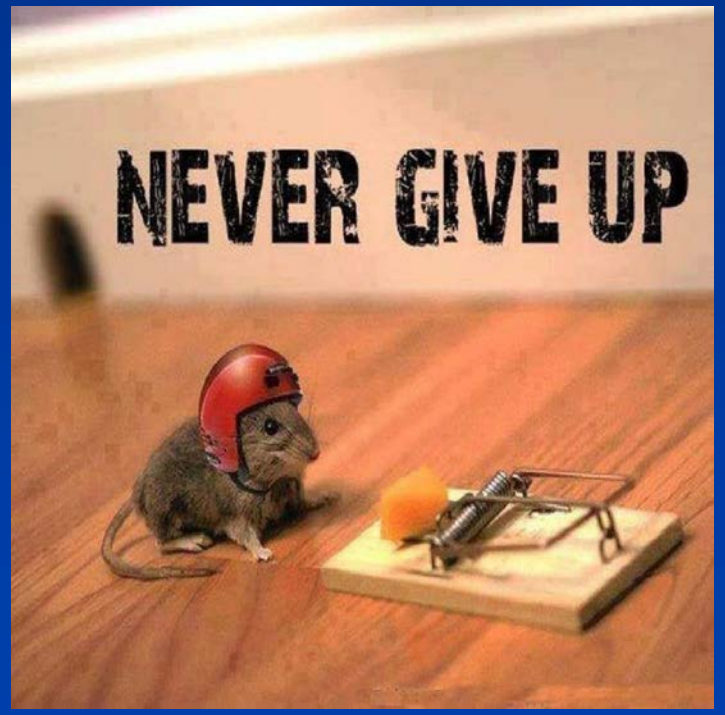
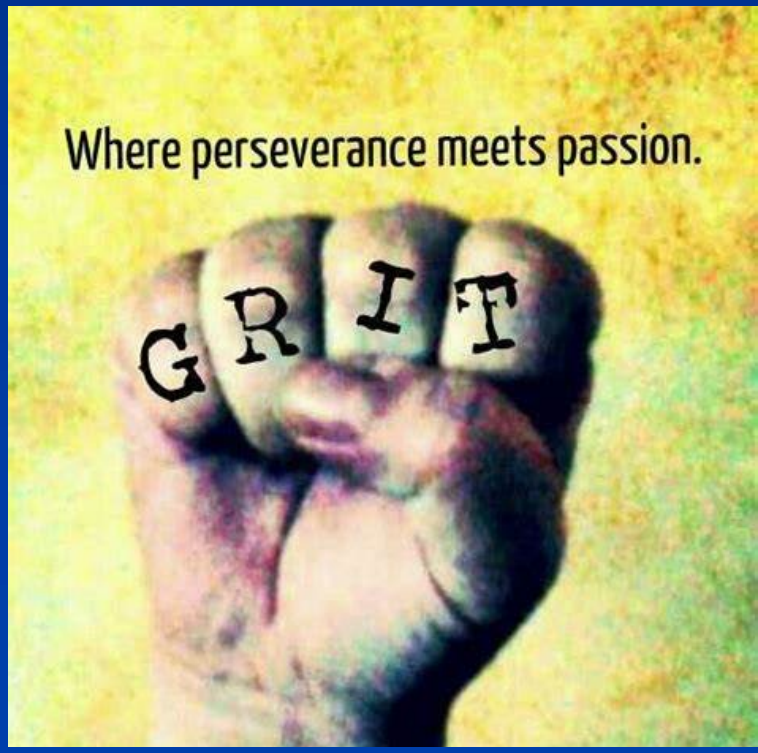
Stick with it



- Fail and fail again
  - Failure is the greatest key to success
- Be humble and learn from criticism
  - POSNA/ORS have whole lists of research mentors with contact info



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Scoliosis Research Society
Dedicated to the optimal care of patients with spinal deformity

ORS
Orthopaedic Research Society

POSNA
PEDIATRIC ORTHOPAEDIC SOCIETY OF NORTH AMERICA

Summary

- Know your resources and your comfort zone
- Critical self assessment
- Collaborate with people that know more than you and that you trust

Translational research can take a lifetime but can shape a lifetime

Thank You

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