

Shaping the Future of Surgery - Innovation at the Intersection of Medicine, Science and Industry

Dr. Jana Felicitas Schader

Physician Scientist
Balgrist University Hospital Zurich

PhD Candidate Biomechanics
ETH Zurich

Lead Spine Research
Balgrist Campus

Lead Medical Education OR-X
OR-X



Health Cluster Lengg Area

HIRSLANDEN

balgristcampus

+EPI

schulthess
klinik

UNIVERSITÄTS-
KINDERSPITAL
ZÜRICH

Psychiatrische
Universitätsklinik
Zürich

Mathilde Escher
Stiftung

Balgrist
University Hospital

OR-X
Translational
center for surgery

Together with:

University of
Zürich^{UZH}

ETH zürich



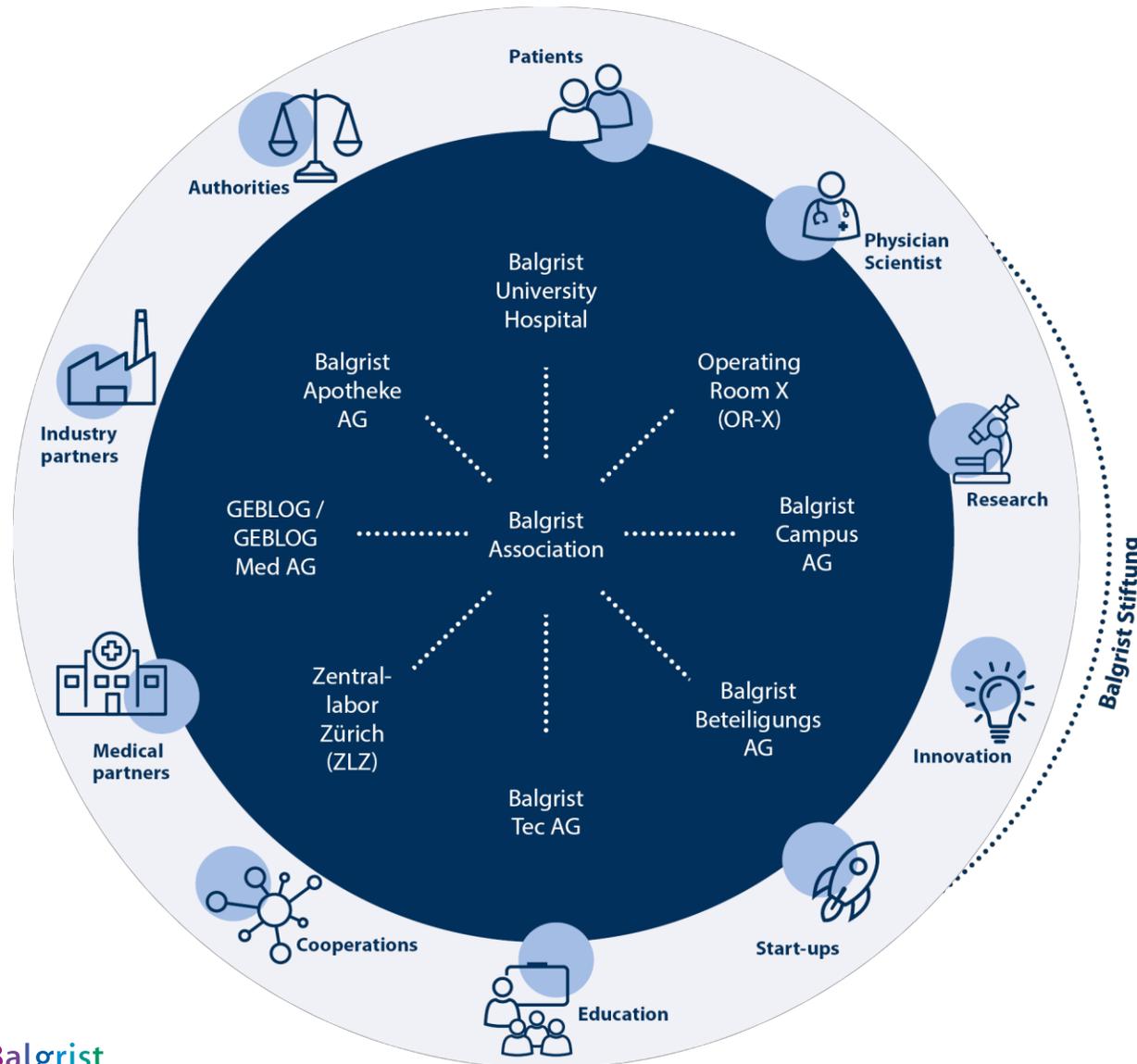
Balgrist
Ecosystem

balgristcampus

Balgrist
University Hospital

OR-X
Translational
center for surgery

The Balgrist Group Ecosystem and its Stakeholders



Universitäre Medizin
Zürich^{UMZH}



ETH zürich

Balgrist

University Hospital

USZ Universitäts-
Spital Zürich

UNIVERSITÄTS-
KINDERSPITAL
ZÜRICH

Psychiatrische
Universitätsklinik
Zürich

Balgrist University Hospital for Musculoskeletal Medicine

Highly specialized hospital treating **patients** with musculoskeletal system diseases

Renowned **research & innovation** site

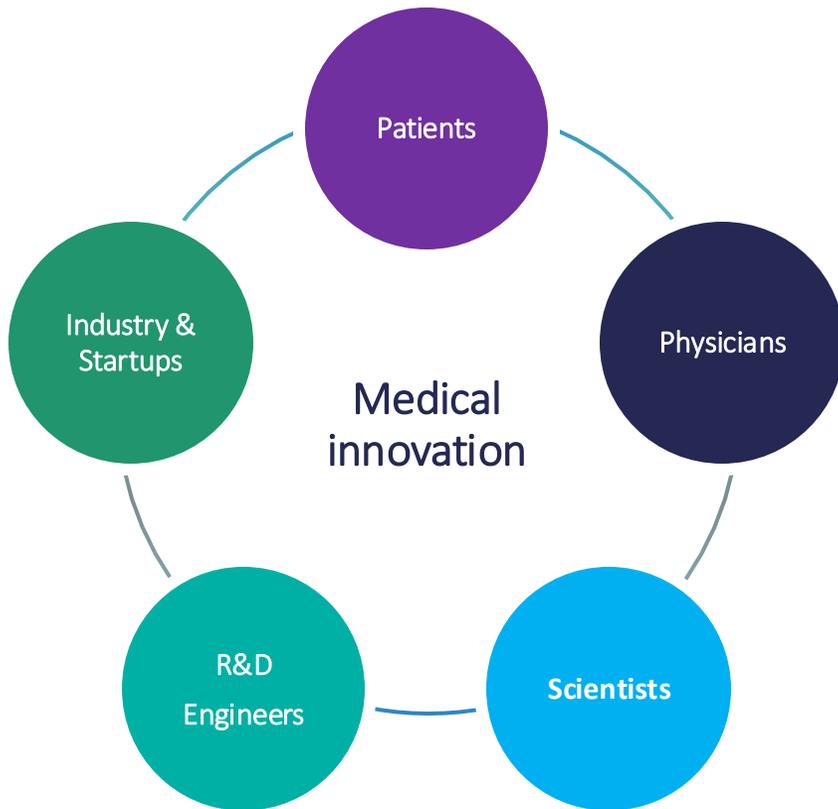
Leading **educational institution** for universities and health professionals







Translational Musculoskeletal Medicine based on Disease Understanding in Fundamental Research

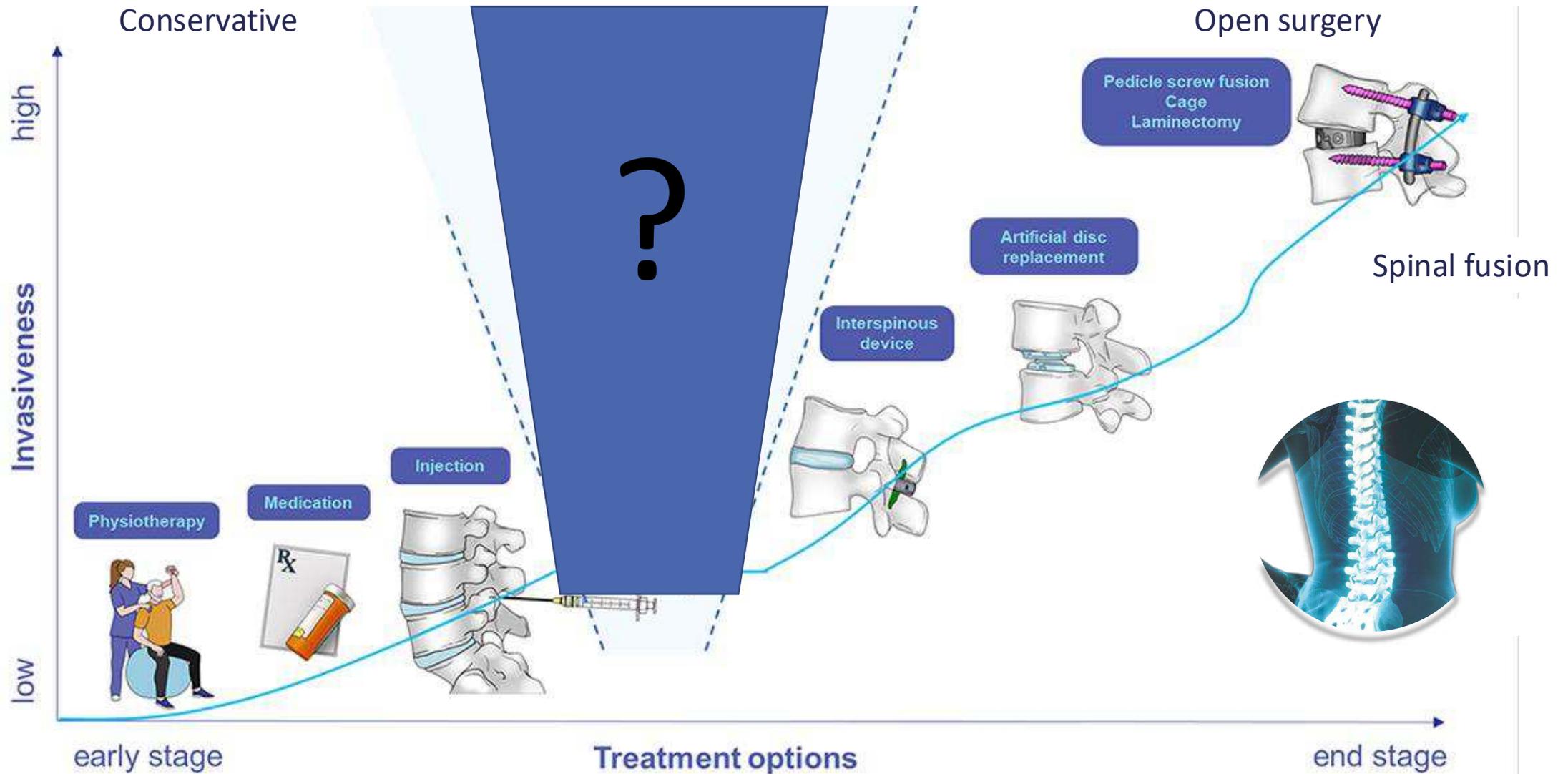


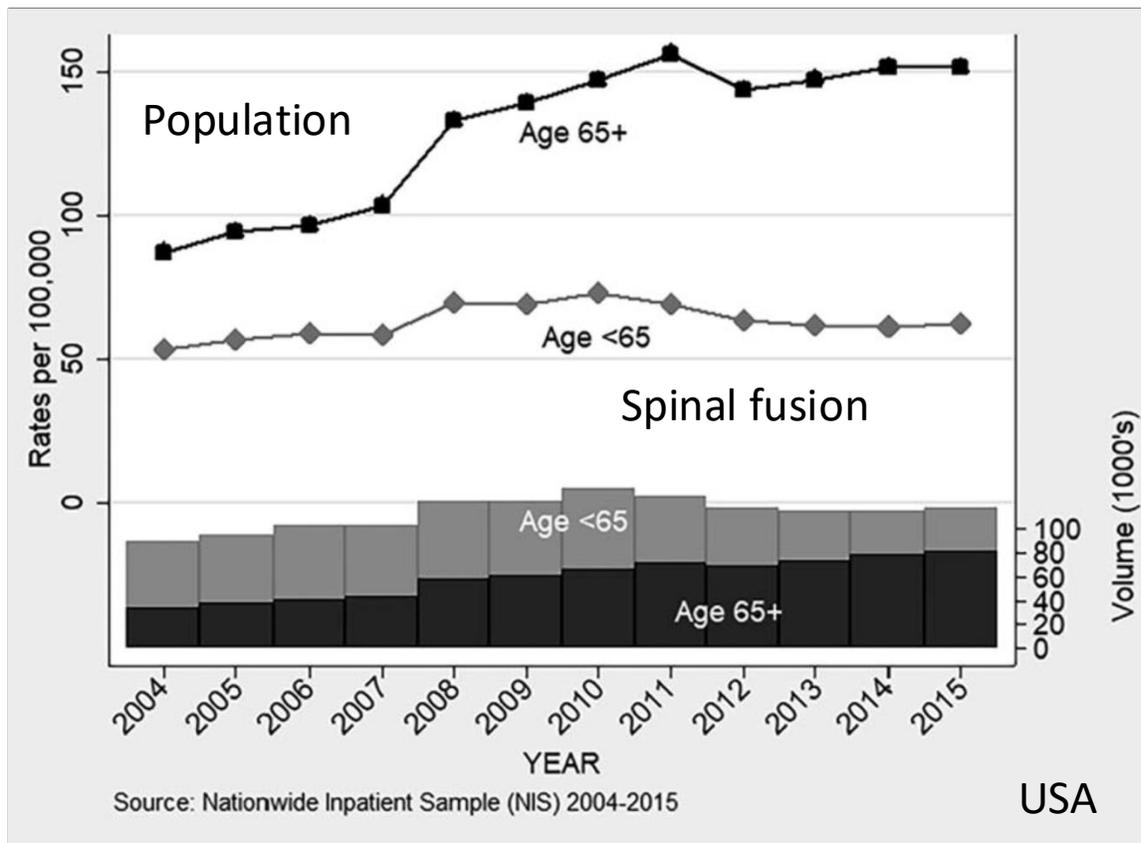
From problem to solution (discovery)

Due diligence (bench testing)

Proof of concept (clinical trial)

Chronic low back pain leading cause of disability worldwide





People > 65 years increasing ¹

Number of spine surgeries ↑ ↑^{2,3,4}

Spinal fusion: 7.6 million per year worldwide ⁵

Complication rate: 30-40%¹⁻⁴

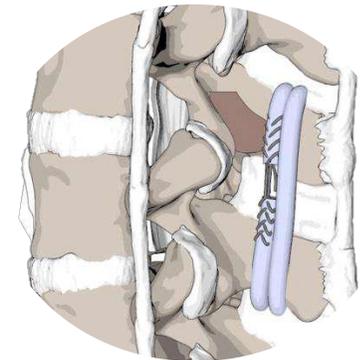
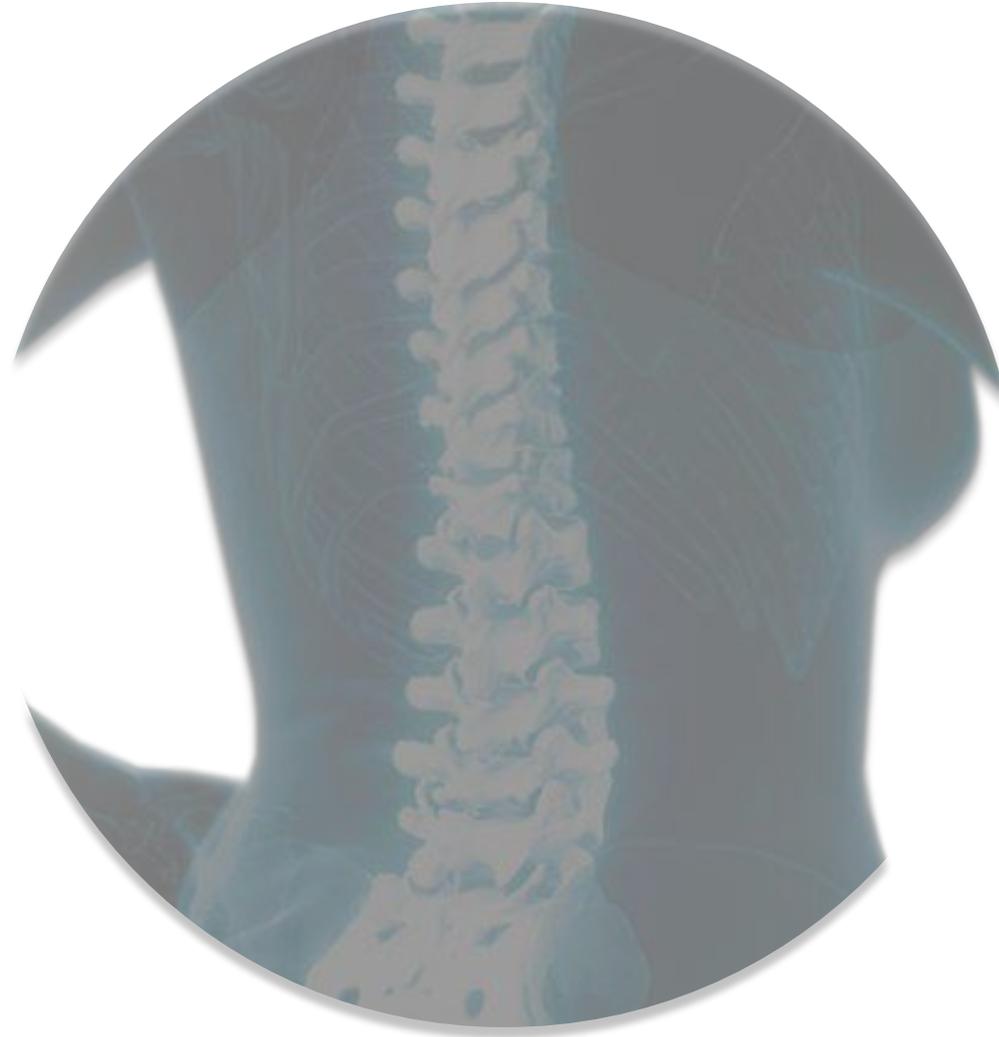
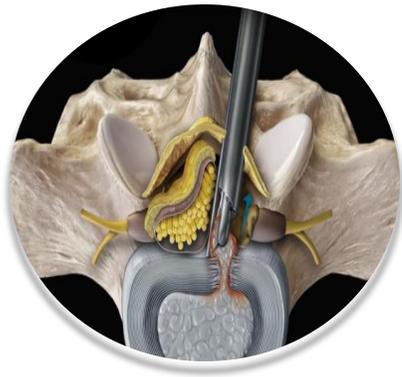
Revision surgery 15 years: 30% ⁵

1 United Nations DoEaSA, Population Division. World Population Ageing 2019: Highlights. (2019)
 2 Martin et al /Spine (Phila Pa 1976) (2019)
 3 Reisener MJ, et al. / J Spine Surg. (2020)
 4 Rajae SS, et al. / Spine (Phila Pa 1976). (2012)
 5 Lifesciencemarketresearch. <https://www.lifesciencemarketresearch.com/market-reports/spine-surgery-global-trends-opportunities-procedure-volumes-analysis-2018>. (2018)

¹Park P et al. / Spine (Phila Pa 1976). (2004)
³ Marie-Hardy L et al. / Global Spine J. (2020)
 Surg. (2012)
⁵ Maruenda JJ et al. / Eur Spine J. (2016)

² Chen Z et al. / Eur Spine J. (2008)
⁴ Chrastil J et al. / J Am Acad Orthop Surg. (2012)

New era of minimally invasive, biology respecting spine surgery



Vertebro (Spine) + pexy (Fixation)

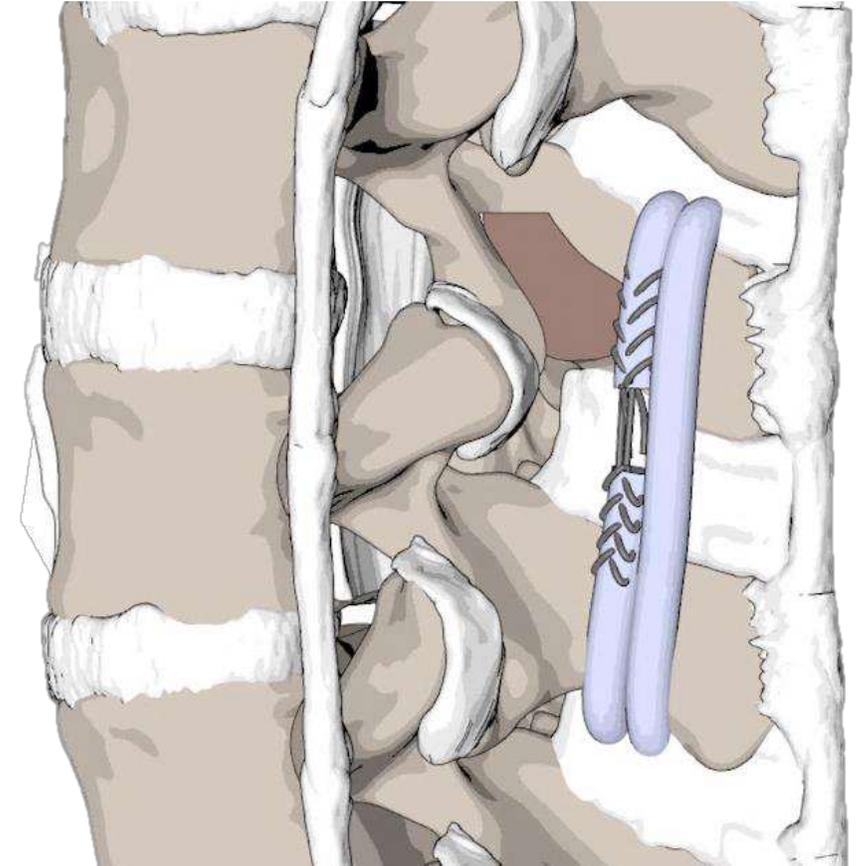
Latin vertebra (“a joint”)

- **targeted stabilization** of the spinal joints in clinically important directions (“**vertebro-**”)

New Latin -pexia,

Greek - pêxis a fixing, solidity

- by **tendon-based fixation** (“**pexy**”)



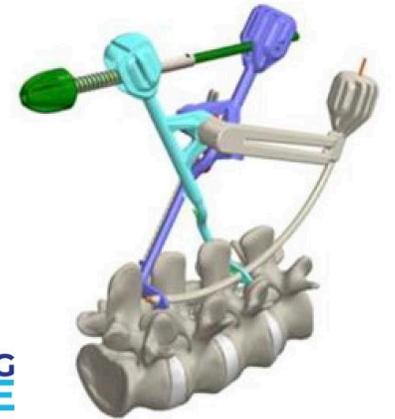
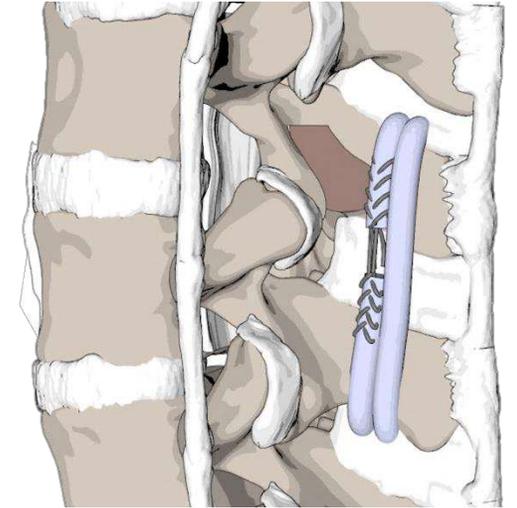
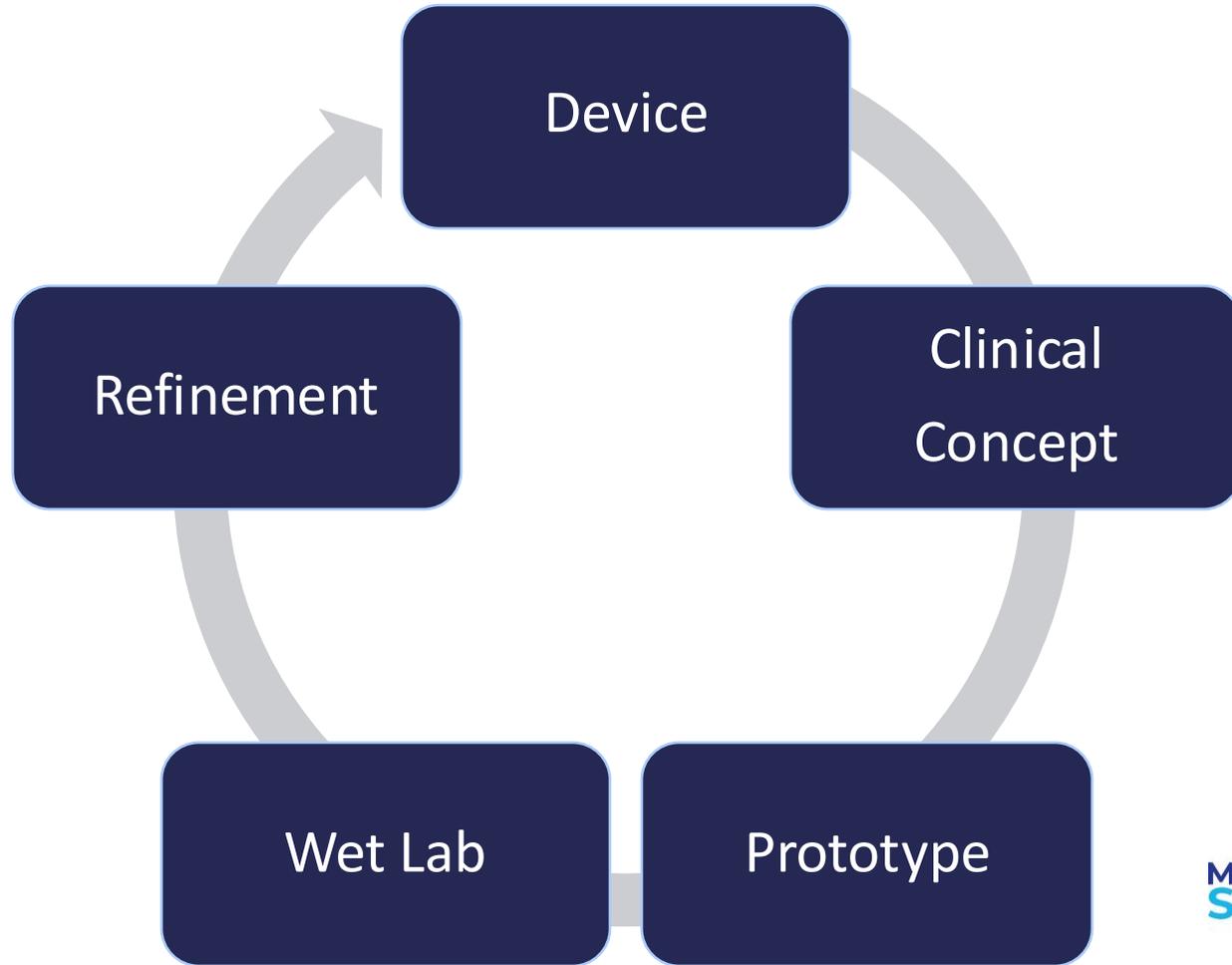
Realization of surgical innovation – IDEAL framework ¹

¹ McCulloch et al, Lancet 2009 and BMJ 2013





OR-X
Translational
center for surgery



**MOVING
SPINE**



Thanks to...



Let's connect!

Dr.med. Jana Felicitas Schader
Balgrist University Hospital

Forchstrasse 340
8008 Zürich, Schweiz
www.balgrist.ch
T +41 44 386 11 11
Jana.schader@balgrist.ch

