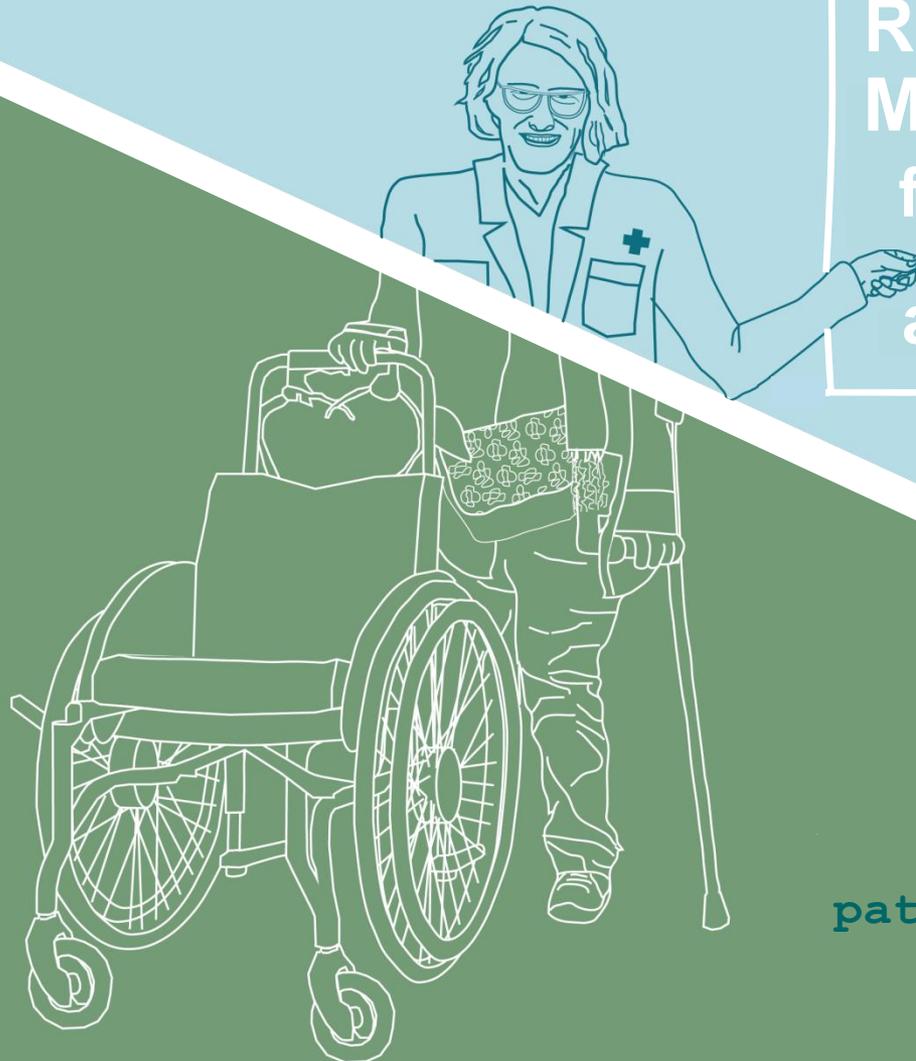


professional



RISK MANAGEMENT

for rare bone
diseases in
adult age

patient with disability



Outline

- 1 Introduction
- 2 Bone diseases
- 3 Focus on osteogenesis imperfecta:
The main clinical types
- 4 Living with personal risk
- 5 Special risk situations
- 6 Discussion, questions



Rare diseases: In total frequent and increasing

- Definition:
1 or less affected persons
under 2'000 people
- 6,000-8,000 previously
known diseases
- According to BAG 7.2% affected
in CH = approx. 600'000
(more than diabetes)
- 80% of genetic origin, but
the crucial gene is known
only in 50%
- > 50% in childhood
- 95% without specific
treatment option
- The diseases are
often serious, disabling
or lethal; the courses are
progressive and chronic
- Motoric, sensory and mental
impairments
- Interdisciplinary treatments required
- Increasing with improved diagnostics
- Lifespan increasing



Resume of an RD-patient

- Diagnosis shortly after birth
- Many hospital stays with anaesthesia
- Post-traumatic disorders (diagnosed late)
- Able to walk after numerous corrective operations
- Career in the BAG (zig-zag)
- Co-founder of SVOI-ASOI in 1986 (hon. member), VP of ProRaris, ex-president of Agile
- Professional memberships: Health Switzerland (hon. memb.) Doctors for Environmental Protection (-2020)
- Early retirement (for 14 years)
- Currently: Voluntary activities, e.g. representative of ProRaris in the specialist group «care» of Kosek, member of SG BOND
- Projects: meingleichgewicht (EB); currently: BELIA (project for the elderly)



Difficulties

- Recognising the disease (diagnosis)
- Lack of innovation, research and treatment options
- Lack of specific medical structures
- Unclear assumption of costs by health-/disability-insurances
- Educational and professional integration
- Lack of psychosocial support

Albrecht Popp, PD Dr. med.

Senior Consultant Osteology, UDEM, Inselspital Bern

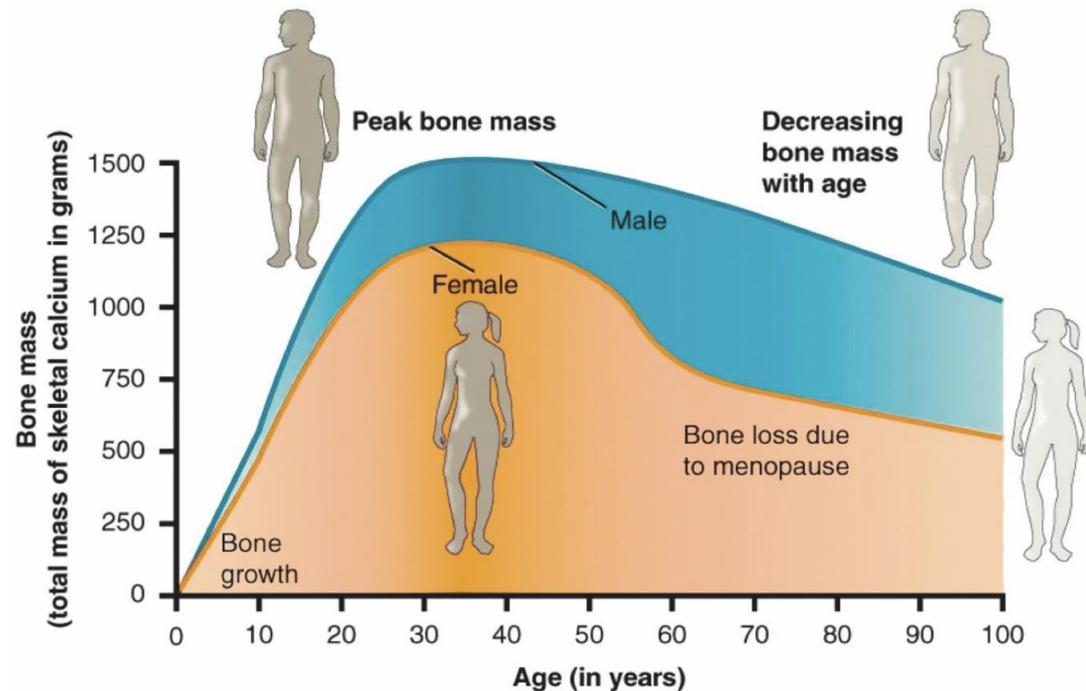
Potential conflicts of interest:

Board member of SVOI, SVGO, SG BOND and DVO.

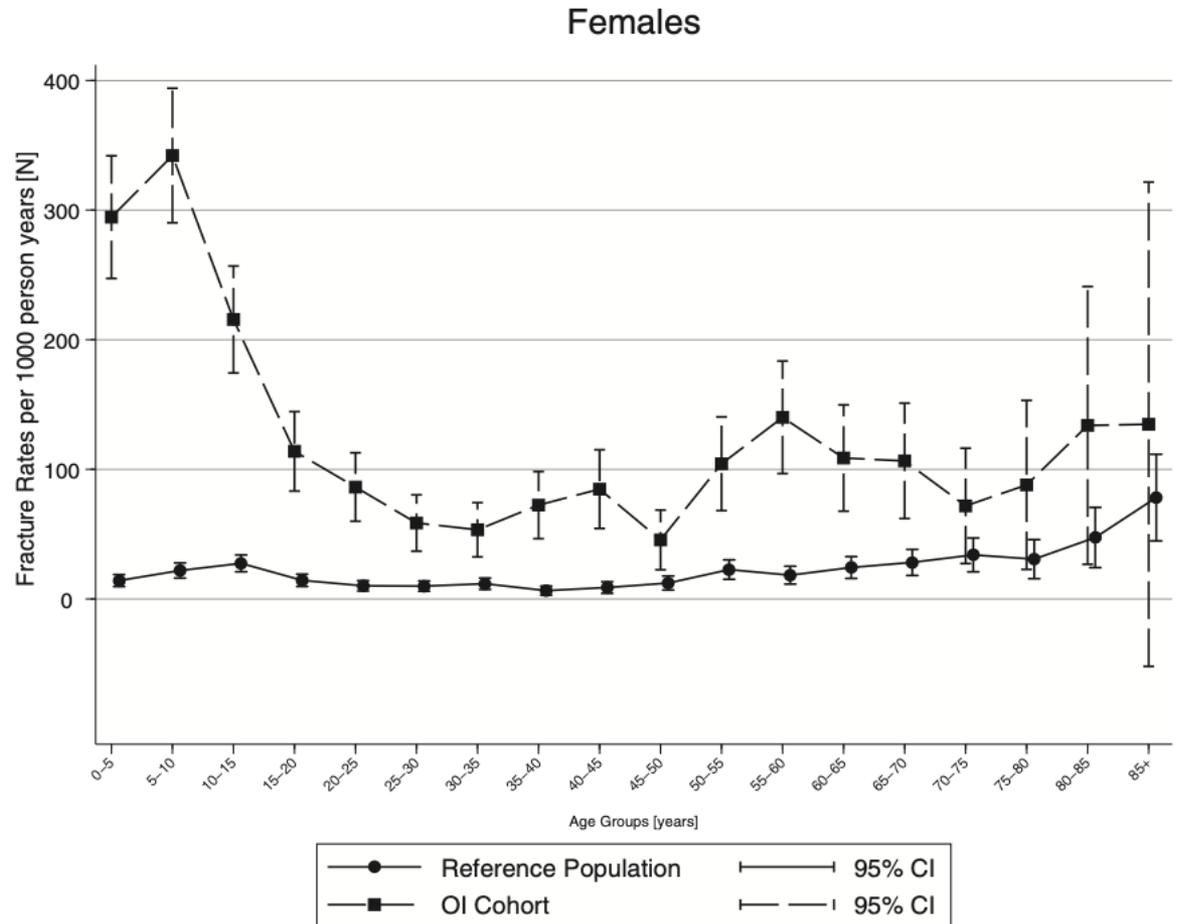
No compensation from the pharmaceutical industry in the last 5 years

Metabolic Bone Diseases

- Osteoporosis
- Osteomalacia
- Primary Hyperparathyroidism
- Paget's Disease
- Osteogenesis imperfecta

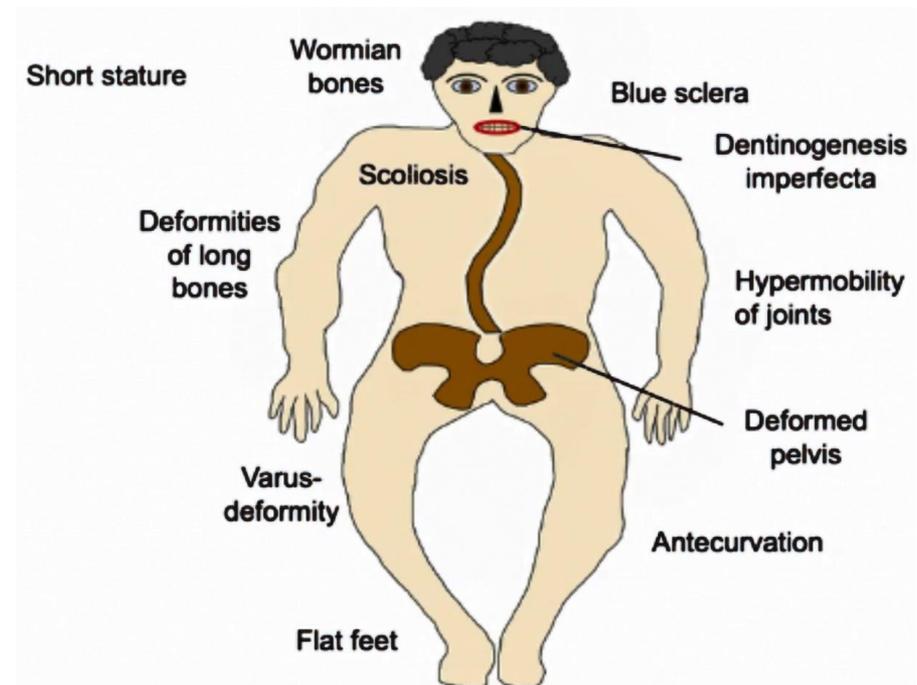


Fracture rate in women with OI 4 to 17 times higher than in the reference



OI as a connective tissue disease

- Fractures, bone deformity and scoliosis
- Muscular weakness
- Hyperlaxity (joints/ skin)
- Brittle teeth
- Premature hearing loss
- Visual impairment
- Heart/ vascular changes
- Respiratory diseases



With Courtesy of Prof. O. Semler

Der Informationsfilm über OI kann über diesen Link angeschaut werden

<https://www.youtube.com/watch?v=ILMiFjgZ2vE>

professional

disabled patient



Osteogenesis imperfecta



professional

disabled patient



Osteogenesis Imperfecta: Europe

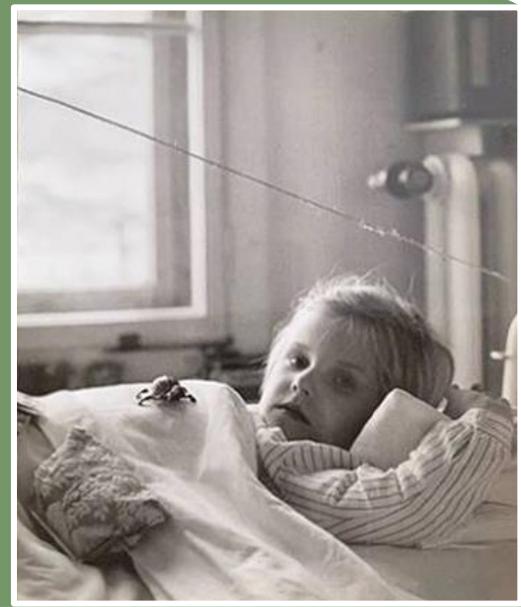




Different phases of mobility



- Childhood: often bedridden; mostly in wheelchair
- Able to walk without aids between 20 and 63 years
- 2 years in a wheelchair after a thigh fracture
- Now: Limited ability to walk (on crutches)



professional

disabled patient



at home



Living with the personal risk



professional

disabled patient



Living with the personal risk

at home





Living with the personal risk

Training



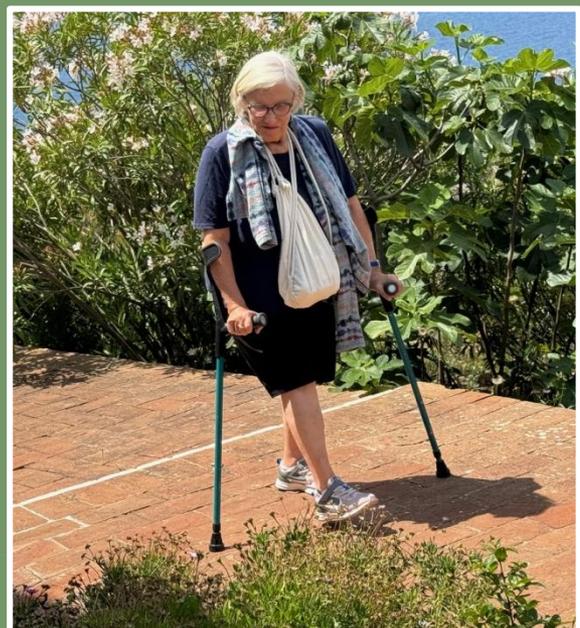
professional

disabled patient



Living with the personal risk

holidays



professional

disabled patient



holidays

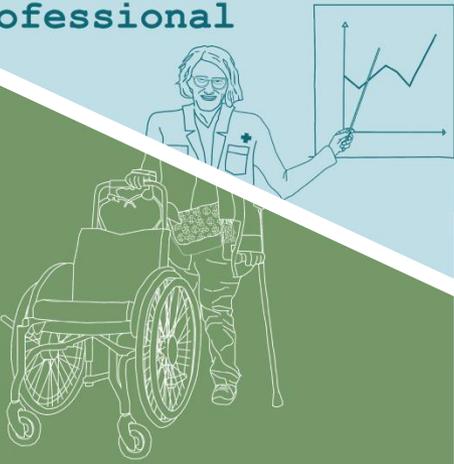


Living with the personal risk



professional

disabled patient



Living with the personal risk

Traveling





Living with the personal risk

Traveling



Consequences for people with OI

- Pain often becomes chronic
- Rapid fatigue
- Short stature
- Traumatizing pain experiences and immobilization in childhood
- **Dependency**
- **Exclusion** – not only in terms of physical activity
- Limited career choices
- **Increased morbidity and mortality**

Therapeutic goals

- Minimization of pain
- Prevention of complications (fractures, deformities, etc.)
- Ensuring mobility
- Preservation of autonomy



Self-management



**Pain
management**



**Physical
Activity**



Nutrition

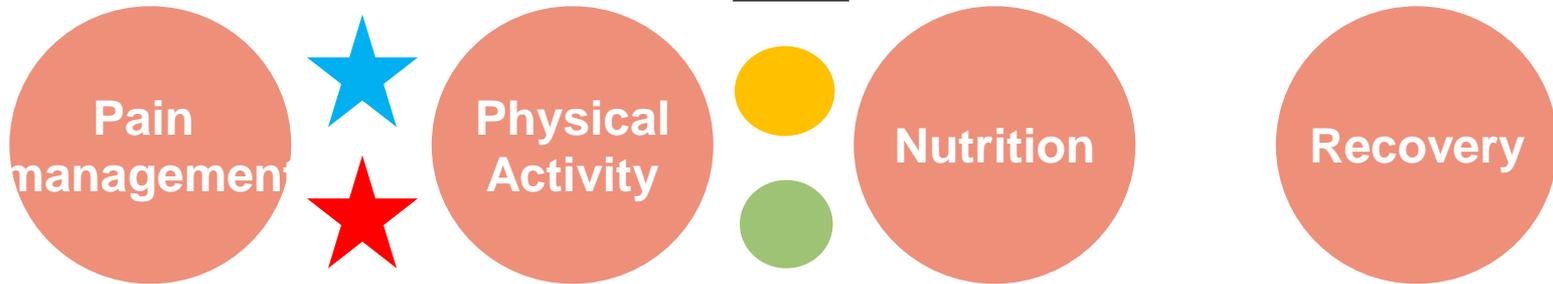


Recovery



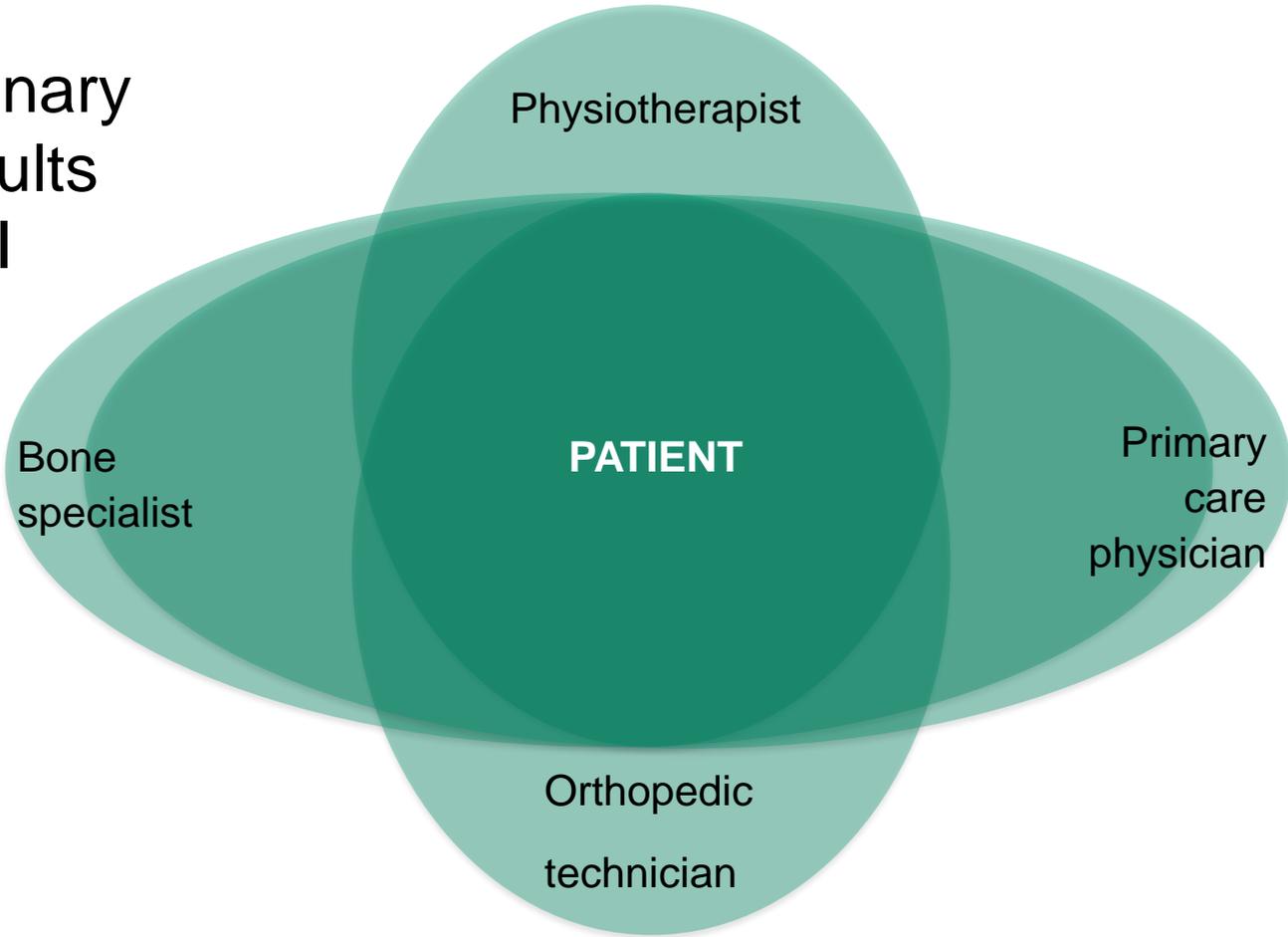
Patients' organization

Self-management



Patients' organization

Interdisciplinary care in adults with OI



High-risk situations for people with OI

- **Anesthesia** risks increased:
 - airway abnormalities (teeth!) and cardiopulmonary,
 - injury from blood pressure cuffs, risk of hyperthermia,
 - spinal block only possible to a limited extent
- **Orthopedic surgery:**
 - avoiding deformity, intramedullary fixation , cement-free
- **Pregnancy:**
 - pre-eclampsia and bleeding more common, more premature/inadequate births,

Adults with OI need to be prepared for emergencies

GP/bone specialist

medication, allergies, intolerances, patient-specific information



In 22 languages

I have osteogenesis imperfecta (OI, brittle bone disease). This means that my bones break easily. However, OI affects not only the bones, but all connective tissue.

Please ask me/my parents/my companions before moving, transporting, examining or treating me; follow my/their instructions on how to safely handle and move me.

We would like to remind you of the following:

- In osteogenesis imperfecta, fractures can occur easily or even spontaneously.

...

Notfallausweis OI SG BOND



Persönliche Daten
Notfallausweis Osteogenesis Imperfecta (OI)
 « Glasknochen-Krankheit»

Name

Geburtsdatum

Adresse

Telefon / Mail

Kontaktperson für Notfälle

Überweisender Arzt für OI / Überweisender Chirurg

Angaben zum Hausarzt (Name, Adresse, Telefon, Email)

Mein Referenzzentrum für seltene Krankheiten



**Ich habe Osteogenesis Imperfecta (Glasknochenkrankheit).
 Aus diesem Grund brechen meine Knochen häufig.
 Bitte befolgen Sie meine Anweisungen oder die meiner
 Begleitperson, mich mit größtmöglicher Sorgfalt zu
 transportieren.**

**Krankenwagenfahrer
 Bitte beachten Sie folgende Punkte:**

Verabreichen Sie als erstes Schmerzmittel direkt über die Infusion.

Bei Patienten mit Osteogenesis Imperfecta können sehr leicht, manchmal sogar spontan, Brüche auftreten.

Die Symptome sind nicht immer offensichtlich; ein einfacher Schmerz kann ein Anzeichen für eine Fraktur sein.

Eine Fraktur kann auch durch eine einfache Untersuchung oder sogar ein leichtes Trauma (Anstoßen, leichter Stoß...) verursacht werden.

Brüche sind in der Regel schmerzhaft, aber das ist nicht immer der Fall.

Zur Ruhigstellung eines Bruchs ist es am besten, leichte Materialien zu verwenden.

Bitte berücksichtigen Sie meine Wahl des Krankenhauses für meine Behandlung.

**Notaufnahme
 Bitte beachten Sie folgende Punkte:**

Bei Patienten mit Osteogenesis Imperfecta sollte man mit der Untersuchung und der Einleitung weiterer Massnahmen nicht lange warten.

Viele Patienten mit Osteogenesis Imperfecta sind auch taub.

In Anbetracht der vielen früheren Traumata muss die Angst ernst genommen werden.

**Auf keinen Fall sollten Sie den Bruch richten, da Sie
 dadurch weitere Schäden verursachen können.**



Es ist wichtig, dem Patienten zuzuhören, denn er ist der beste Spezialist für seine Krankheit.

Sobald sich der Patient beruhigt hat, sollte ein verantwortlicher Chirurg innerhalb von 12 Stunden mit ihm besprechen, ob ein konservativer oder operativer Eingriff angezeigt ist.

Das Gutachten/die Beurteilung eines Facharztes oder Chirurgen für Osteogenesis Imperfecta ist erforderlich.

Folgender Arzt ist in ihrem Zentrum für OI zuständig.....

Chirurgie und Anästhesie: Bitte beachten Sie Folgendes

Bitte berücksichtigen Sie beim Stabilisieren des Patienten vorhandene Deformitäten.

Die Dosierung für medikamentöse Behandlungen und Anästhesie sollte sich an der Größe des Patienten orientieren und nicht an seinem Alter.

Achten Sie darauf, Unverträglichkeiten und Allergien zu besprechen.

Neigen Sie den Kopf während der Intubation sanft, um eine Zervikal Fraktur zu vermeiden.

Achten Sie auf die Trachealschleimhaut. Die Zähne sind brüchiger als bei einer normalen Person.

Meine Wünsche für die Pflege

.....

Aktualisiert am

Risk management: examinations for adults with OI – what is useful and when? No consensus.

- Bone check including DXA, ideally also with remodeling marker in the blood every 2-5 years, or more often depending on clinics
- Hearing test (audiometry) – depending on clinics
- Ophthalmological check-up – depending on clinics
- Cardiovascular check-up (cardiologist) – depending on risk profile or findings
- Pulmonary function (primary care physician/pulmonologist), depending on findings/ clinics

Possible indications for bone-specific therapy

- Incident vertebral fracture or accumulation of peripheral fractures
- Definite bone mineral loss, **but not low bone density alone!**
- Consideration of factors independent of BMD (analogous to FRAX criteria for patients > 50 years of age)

- Without evidence: pain

Bone active drugs

MIXED

- SCLEROSTIN-AK
(EVENTY)

ANTIRESORPTIVE

- RANKL-AK (PROLIA)
- BISPHOSPHONATE
(ZOLEDRONAT, ALENDRONAT etc.)
- ESTROGEN (OB/GYN only)
- SERM (EVISTA)

BONE FORMING

- PTH-ANALOGA
(FORSTEO, generic, biosimilars)

Prevention by a diphosphonate of immobilization osteoporosis in rats

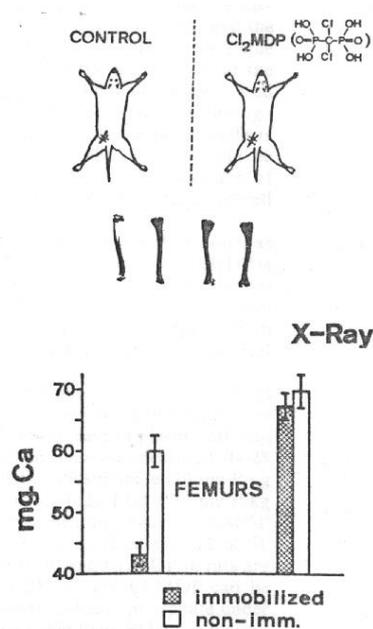
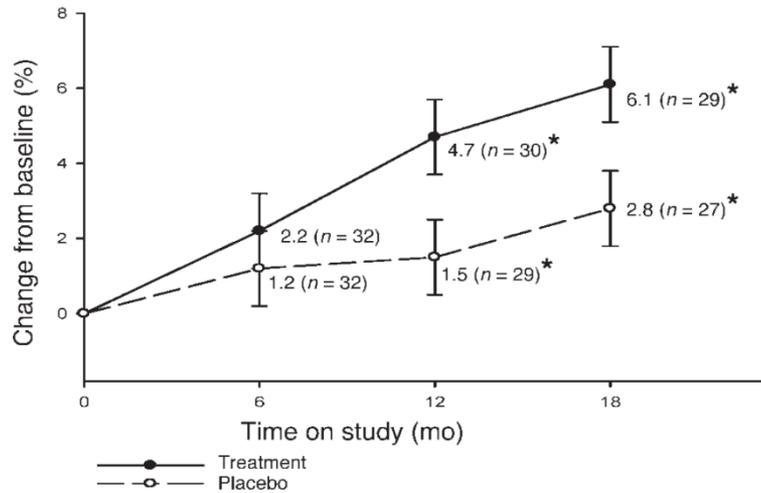


FIG. 5. The prevention by Cl₂MDP of the loss of bone induced by immobilising the left hind limb of male rats weighing 130–150 grams (Fleisch, Russell, Simpson, Mühlbauer, 1969a). After three days treatment with NaCl or Cl₂MDP (10 mg P/kg body weight given s.c.) the 2nd–4th lumbar nerve trunks were severed on the left side. Injections of Cl₂MDP or NaCl were continued daily until the animals were killed twelve days later. The radiographic appearance of tibias from such rats are shown here, together with the calcium analyses.

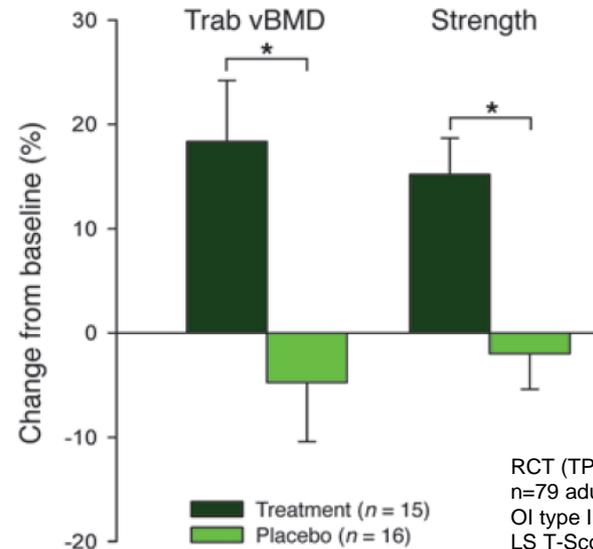
Fleisch H, Russell RG, Simpson B, Mühlbauer RC, Nature. 1969 Jul 12;223: 211-2

Teriparatide in Adults with OI

Spine BMD (g/cm²)



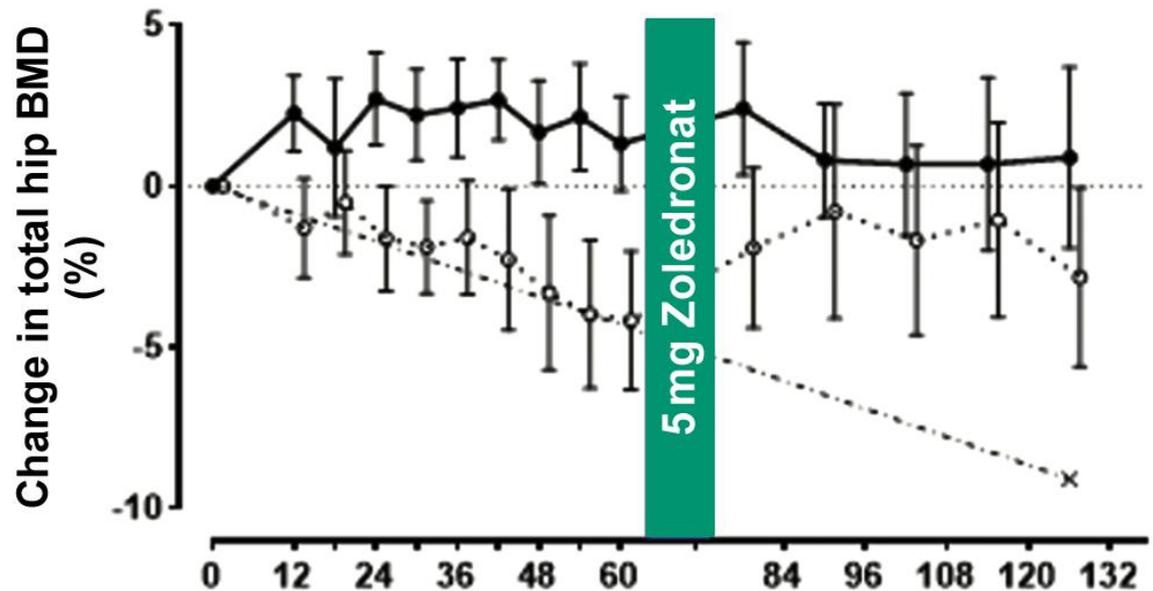
Spine QCT and FEA (vertebral strength)



RCT (TPT vs PBO for 18 mts),
 n=79 adults with OI
 OI type I (66%), mean age 41 yrs
 LS T-Score -2.68, >35 fx in 74%

Zoledronate 5 mg i.v. at 5.5-year intervals prevented BMD loss for almost 11 years

**NO PEOPLE
WITH OI**



Fracture endpoint study in adults with OI - the TOPaZ trial



the TOPaZ trial

TERIPARATIDE followed by ZOLEDRONATE

vs.

STANDARD OF CARE
(incl. BISPHOSPHONATES)

DRUGS ASSOCIATED WITH MEDICATION RELATED OSTEONECROSIS OF THE JAW (MR-ONJ)*



MIXED

- SCLEROSTIN-AK *
(EVENTITY)

ANTIRESORPTIVE

- RANKL-AK * (PROLIA)
- BISPHOSPHONATE *
(ZOLEDRONAT, ALENDRONAT etc.)
- ESTROGEN (OB/GYN only)
- SERM (EVISTA)

BONE FORMING

- PTH-ANALOGA
(FORSTEO, generic, biosimilars)

INCIDENCE OF MR-ONJ WITH ARD IN **OSTEOPOROSIS.** EVENTS PER 10'000 PERSON-YEARS

	Incidence	Duration of use	Reference	Study details
Oral bisphosphonate	~5	5-10 years	Eiken et al. (81)	Denmark; surgical cases only Trials and their extensions
Zoledronate	0.9		Black et al. (47); Lyles et al. (48); Reid et al. (31)	
Denosumab	5.2	4-10 years	Bone et al. (86)	FREEDOM trial extension
Non-BP users	0.8		Black et al. (47)	Placebo group from phase 3 zoledronate trial
	1.1		Eiken et al. (81)	Denmark; surgical cases only
	6.9		Lin et al. (79)	Taiwan

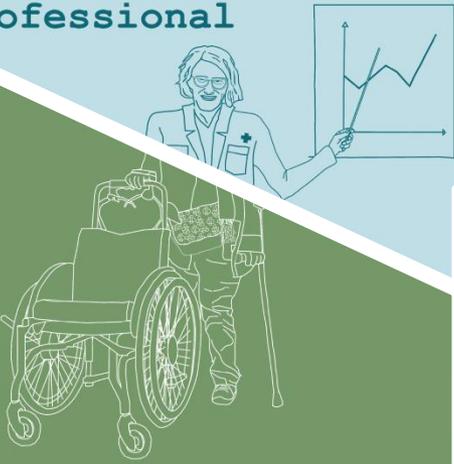
 **There is no safe side**

OI in adulthood - conclusions

- Interdisciplinary care is obligatory for connective tissue disease, self-management of pain and autonomy in focus.
- Implement regular physical activity, optimize intake of vitamin D/ calcium/ protein.
- Fracture risk crucial for the use of medication – regarding risk, consider sequential rather than endless treatment with antiresorptive drugs.

professional

disabled patient



Auxiliary means



professional

disabled patient



Auxiliary means



professional

disabled patient



Energy4OI Evaluation

Welkom!





Energy 4 OI - Team



Tahné van Wonderen
Communication!



Sander Colijn
Project leader



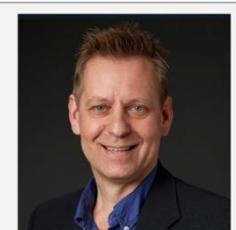
Dagmar Mekking
Director Care4BrittleBones



Dr. A. LoMauro, Politecnico
Researcher



Sara Artusi
Physiotherapist & researcher



Peter Mekking
Technical support

Focus:
Project based: Coordination &
Motivation

Focus:
Medical & Scientific



Isala-Team



Care4BrittleBones Survey 2021 "Physical Wellbeing for OI"



Results

- Physical wellbeing is important
- Motivated
- But not yet that active

There are a lot of different barriers
-> Fitness App for people with OI





ENERGY4OI: Goals of this project

- Making exercise and physical activity more accessible to everyone with OI
 - So that everyone can flexibly and safely do exercises at home in their own time that are safe for people with OI
- Testing a fitness app specifically designed for people with OI
 - Safety
 - Accessibility
 - Effectiveness



Special risk situations

- Stress, time pressure
- Exuberance
- Fatigue
- «Sporty» training
- Sexual encounters

professional

disabled patient



Sexuality

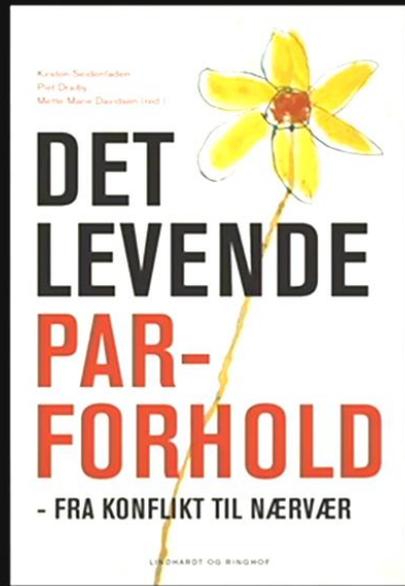
AnnBett Kirkebæk





Sexuality

AnnBett Kirkebæk



10

Titel in English;

Relationships – from conflict to closeness (my own translation)

KISS FOR 1 MINUTE EVERY DAY ☺

- Authors; Seidenfaden, Draiby & Davidsen (red.)
- Publisher; Lindhardt & Ringhof

professional

disabled patient



RISK vs DANGER

You can manage a RISK by yourself to a certain degree

A DANGER must be avoided (e.g. landslide)



professional

disabled patient



No!

The best remedy
against STRESS
has 2 letters:

NO

Ansgar Simon Freigericht



professional

disabled patient



THANKS !

www.stutzsteigerin.ch
www.prorararis.ch