



Procedure

biomechanical and biological in the protection of the hip cartilage

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HIP OSTEOARTHRITIS 19-20 APRIL 2018r, KATOWICE



Why?

For what?



Complications THA and TKA



Knee endoprosthesis
8 380 results (0.29 s)

Hip endoprosthesis
7,840 results (0.38 s)



According to the literature
and own observations

the reason for the growing interest
protection of joint cartilage
there is a high number
dissatisfaction with
endoprosthesis



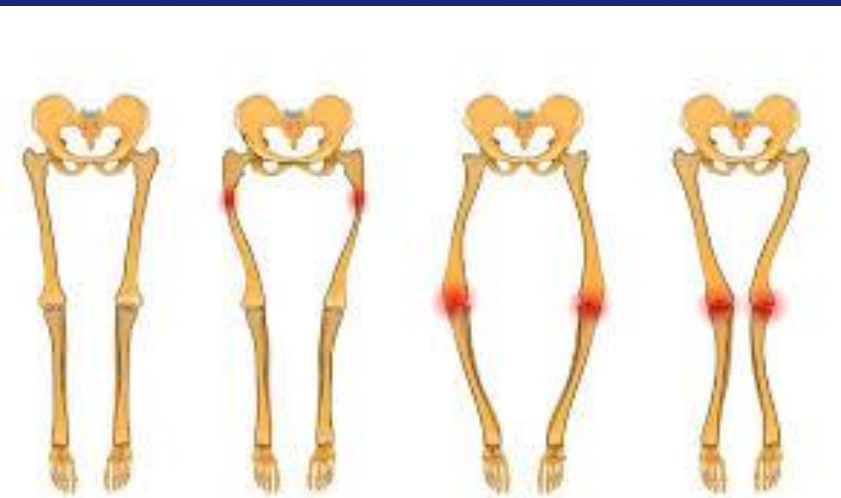
Epidemiology of overload biomechanical hip joint



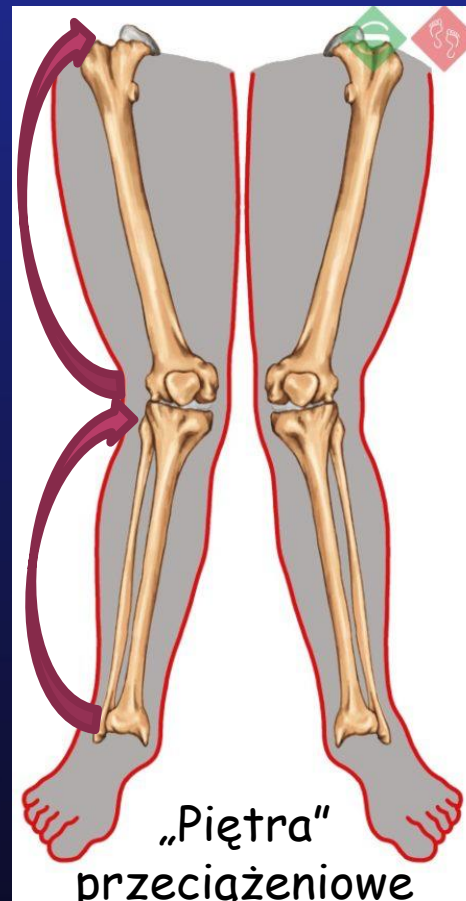
Biomechanics of joint overload in children



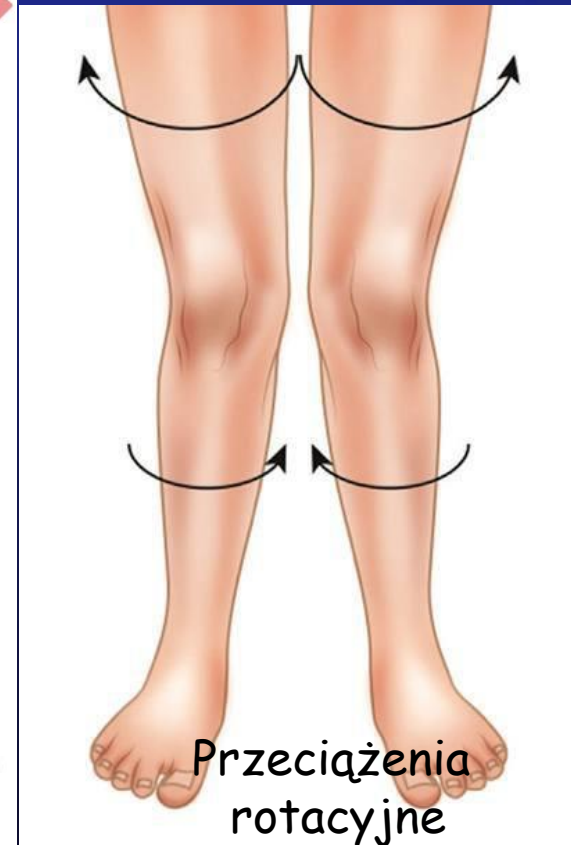
2 790 results (0,31 s)



Interest
Internet



„Piętra”
przeciążeniowe



Przeciążenia
rotacyjne

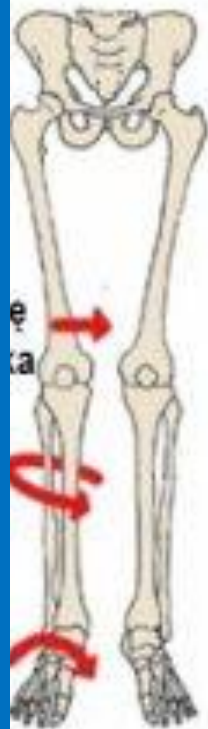


Interest Internet



Biomechanics of joint overload in adults

4 200 results (0,47 s)



overload
rotary

Przeciążenia

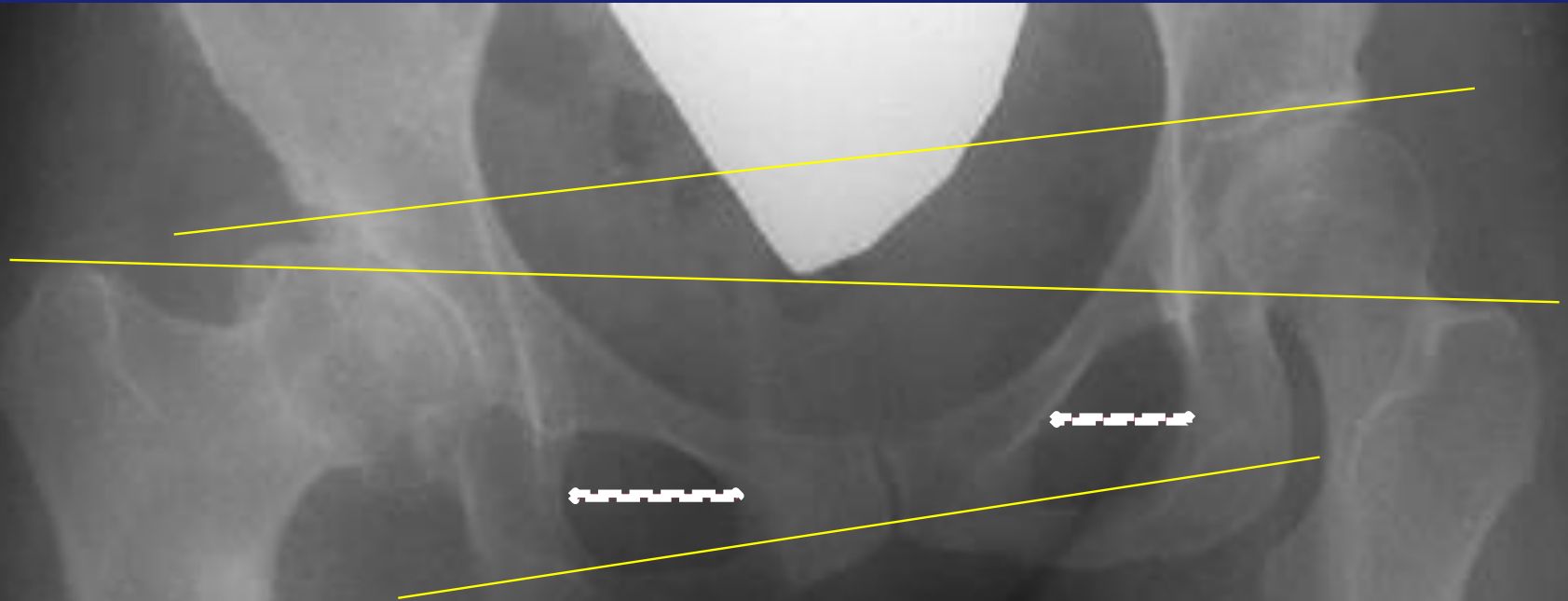
ciążenia
tacyjne



Interest Internet

Hip joint overload

23 400 results (0,42 s)



przeciążeniowe

rotacyjne



Pub Med



Biomechanics of overloading
hip joint

Number of publications
in 2014-2018
80 position



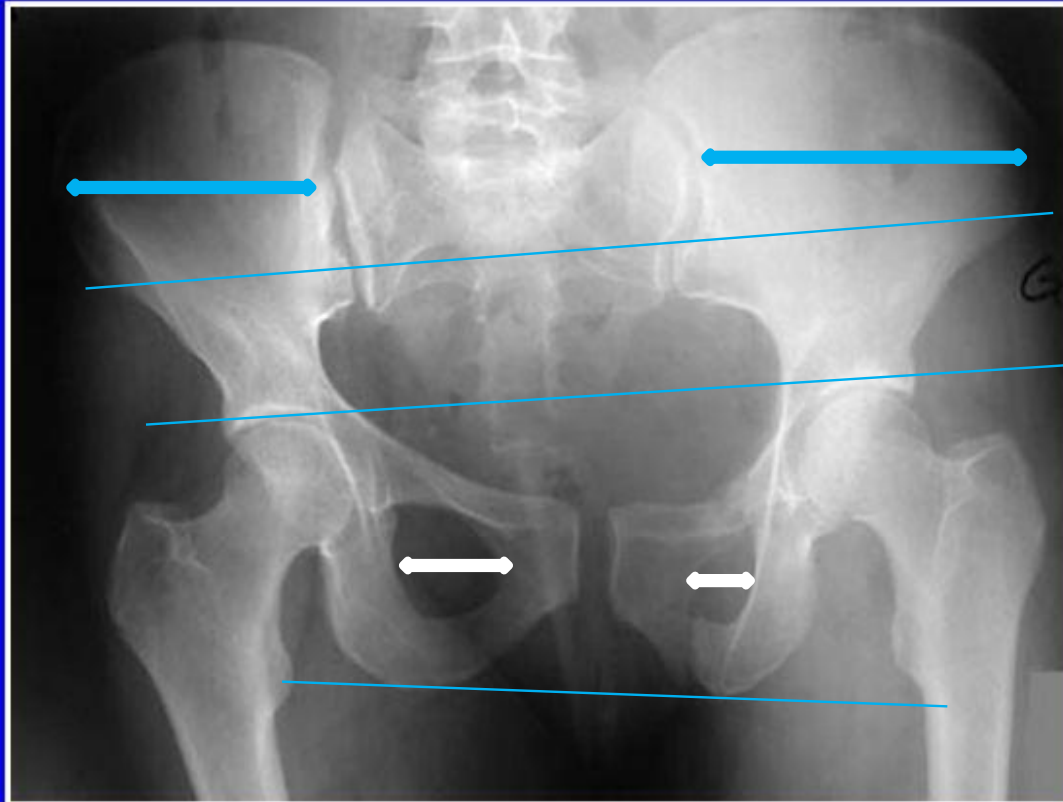
The aim of the presentation
is to analyze
biomechanics of hip joint
overloading and biological
possibilities of articular
cartilage protection



Post-traumatic overload hip joint

Disjonction sacro-iliaque

cisaillement vertical



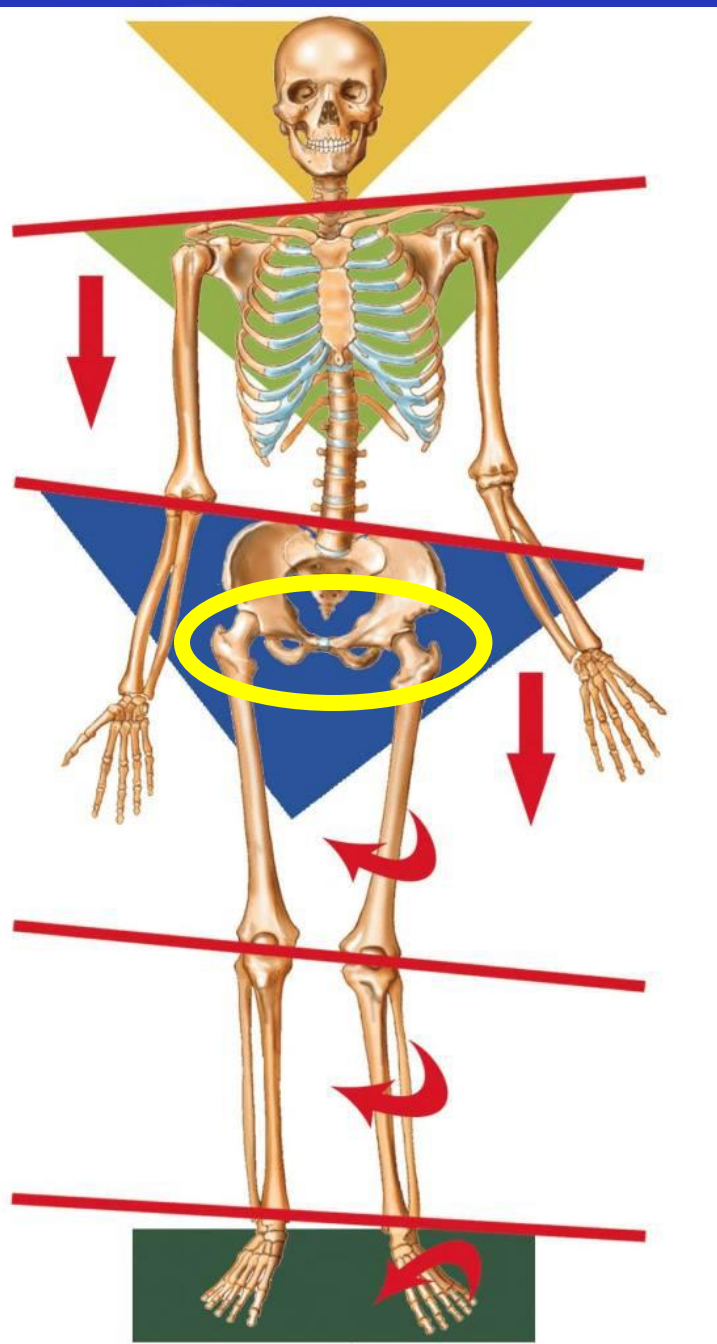
ILIAC ASYMMETRY
=
ROTATION
PELVIS



BAD
BIOMECHANICS
Of the HIPS



Orthopedic overload hip joint



Quadrilateral support
a overloading band
triangles; pelvic
and shoulder

rotational (secondary)

triangles of destabilization

hip overload

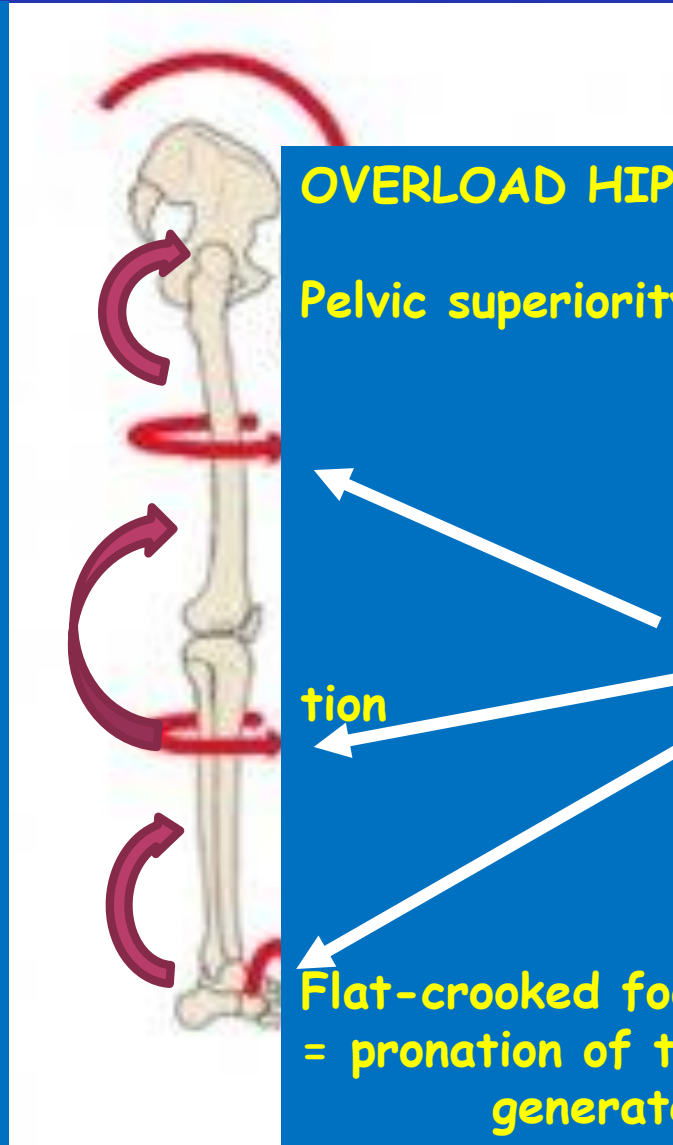


ROTARY

OVERLOAD

JOINT

HIP



OVERLOAD HIPS

Pelvic superiority

tion

**Rota
inside**

**Flat-crooked foot =
= pronation of the foot - it
generates**



**Reliable degree diagnostics
cartilage damage
hip joint**

Evidence based orthopaedics

Hip-joint

Is it really a hip disease?

Or is it a consequence of
the foot flat-crooked, uneven
limb length, limb axis
abnormalities?

What is the degree of damage
cartilage of the hip joint;
irreversible?
reversible?





Biomechanical possibilities

cartilage protection

of the hip joint



Correction of knee joint disorder

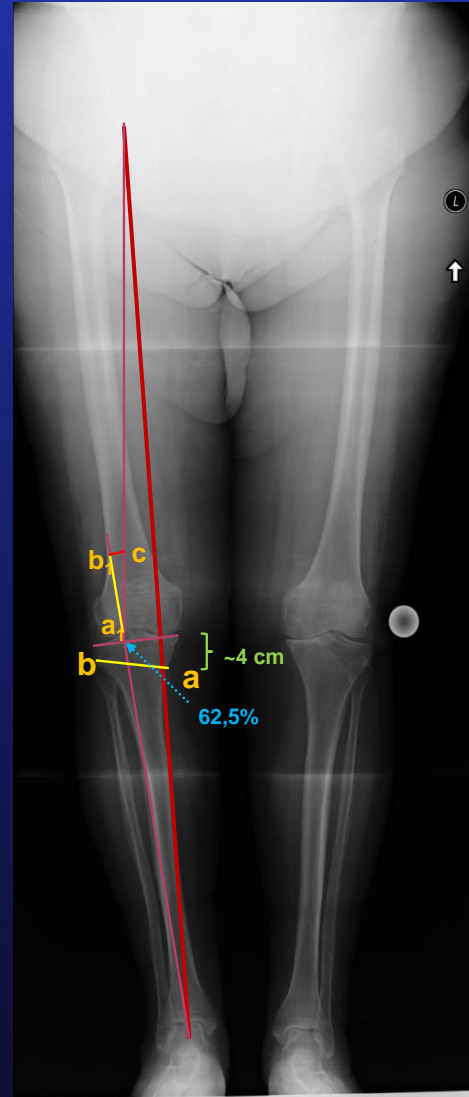
Knee Varus

Knee Valgus

Biomechanical protection

One-compartment unloading
knees and hips

Osteotomy
below the knee



Knee
Varus

cont. Biomechanical protection

One-compartment unloading

knees and hips

Knee Valgus



Osteotomy above the knee





Biomechanical protection
is the basis for
the effectiveness
of biological methods
protection
of joint cartilage
of the hip joint



**Biological possibilities
cartilage protection
hip joint**



Biological protection of cartilage hip joint - an attempt to an algorithm

- humoral
- cellular
- tribological
- substitution
- regenerative

Humoral protection

Platelet rich plasma (PRP)
growth factors





Plate-like growth factors are two elements of the repair backbone of the skeleton according to Lynch, have chondroprotective and osteoinductive properties.



PRPs are only an element of the treatment of cartilage defects, and are not its main course.



No positive reaction



after the first administration

is an indication to

verification of the diagnosis

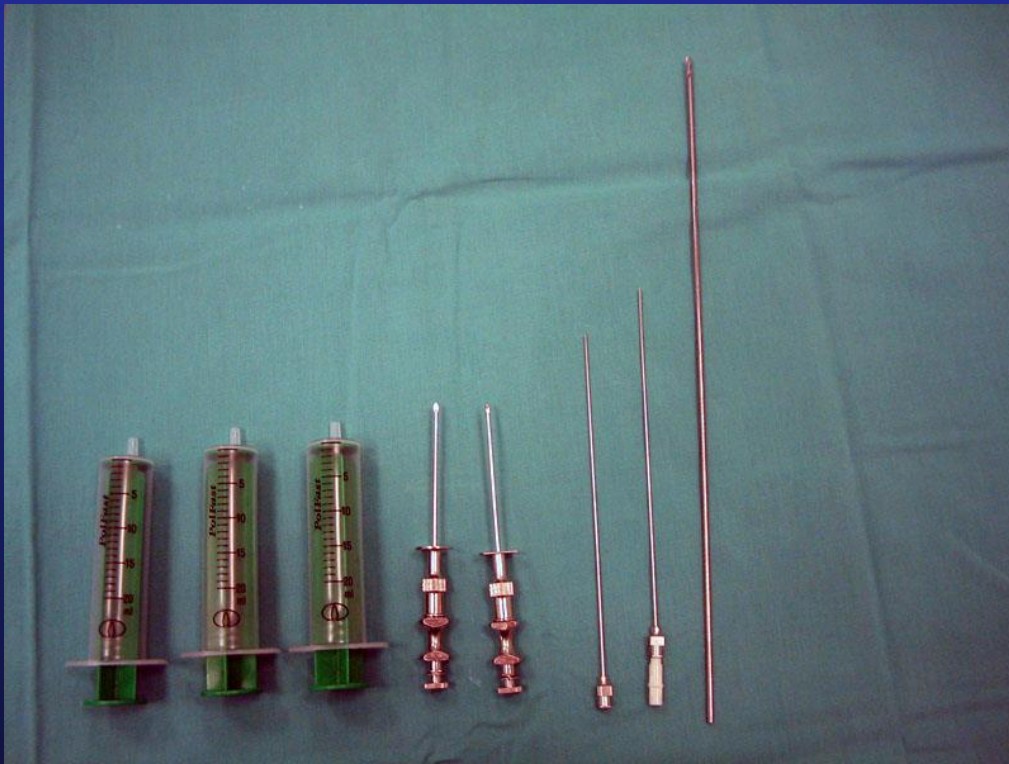
biological (EBM)

and the legitimacy of the indications

Cell protection

Stem cells;

- stromal bone marrow, - fat derivatives



Set to download



After centrifugation

cont. **Cell protection**

Chondrocytes - cultures

The method of implantation:

➤ **intraarticular**



Internet interest



Chondrocyte transplants

3,830 results (0.54 s)



Cell protection



it is stimulated

by humoral protection

- growth factors

Tribological protection

Viscosupplementation.

Application of hyaluronic acid:

- natural or
- synthetic

An attempt to improve the tribological index



Internet interest



Viskosuplementation

3 160 results (0.44 s)

Hyaluronic acid intraarticular

Knee joint 20,000 results (0.49 s)

Shoulder joint 5,660 results (0.49 s)

Hip joint 4 180 results (0.55 s)



Viscosupplementation acts as

temporal reduction of the coefficient
of friction striving for a physiological
0.02

It is an additional element,
and never basic
protection of joint cartilage



The methods mentioned
protection of joint cartilage



they are an indication for implementation
proceedings

substitutional-pharmacological,

as a condition of success

comprehensive treatment

and the basis of biological effectiveness



The pharmacological element of the procedure is the possibility of improving the biology of the joint cartilage structure by diffusion of synovial fluid containing drugs that are components of the matrix.

Protection substitution and regeneration

Chondroprotective preparations

Chondroitin sulphate

Glucosamine sulphate



Performance studies chondroitin sulphate and glucosamine

McAlindon's meta-analysis

1700 patients

15 randomized trials

Dreiser's research

120 subjects

5 months

Uebelhart study

162 patients

6 months



The effectiveness of drugs with chondroitin sulphate and glucosamine was assessed on the basis of two criteria:

- 1. Quantities of NSAIDs (calculated as diclofenac) in the daily dose - objective evaluation**
- 2. Level of pain assessed on the basis of VAS (Visual Analog Scale) - subjective assessment**



EULAR (European Anti-Rheumatic League)



**recommendations for the
treatment of degenerative
disease**



**EULAR classifies chondroitin in the
recommendations for the treatment of
joint cartilage defects **very high**, in
accordance with the data on data
reliability and strength of
recommendations provided.**



Pharmacological protection is a slow process



- administration of an oral preparation
- blood concentration over time
- filtration in the synovial joint
- concentration in the synovial fluid
- penetration into the cartilage
- "pin-eating" mechanism of nutrition
- penetration into the cartilage



Summary



**A condition for protection
cartilage of the hip
is visible
articular gap
in x-ray image with a load**



The basis of the so-called comprehensive procedure is: -



- a credible clinical diagnosis based on the principles of evidence-based medicine (Evident Based Medicine)
- definition of individual pathologies that destroy joint cartilage



Contemporary, comprehensive protection of the hip cartilage



results from optimization;

- biological methods
- biomechanical methods
- stimulation of regenerative
processes
- combination therapy



Literature



Weight-bearing asymmetries during Sit-To-Stand in patients with mild-to-moderate hip osteoarthritis.

Eitzen I¹, Fernandes L², Nordsletten L³, Snyder-Mackler L⁴, Risberg MA⁵
2014 Feb;39(2):683-8. doi: 10.1016/j.gaitpost.2013.09.010. Epub 2013 Sep 23.

Hip joint motion and gluteal muscle activation differences between healthy controls and those with varying degrees of hip osteoarthritis during walking.

Rutherford DJ¹, Moreside J², Wong I³.
2015 Dec;25(6):944-50. doi: 10.1016/j.jelekin.2015.10.010. Epub 2015 Oct 23.

Hip joint mechanics during walking in individuals with mild-to-moderate hip osteoarthritis.

Constantinou M¹, Loureiro A², Carty C³, Mills P⁴, Barrett R⁵.
2017 Mar;53:162-167. doi: 10.1016/j.gaitpost.2017.01.017. Epub 2017 Jan 24.

**Orthopedics Department of
Postgraduate Medical Education Centre,
Teaching Hospital Warsaw-Otwock, Poland**
Head of Department: Prof. Wojciech Marczyński, MD, PhD

450 orthopedics beds

2017 year

**12 operating
theaters**

- 10 972 patients**
- 8 148 surgery**
- 61 329 out-patients**

**THANK YOU FOR
YOUR ATTANTION**

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Centrum Medycznego Kształcenia Podyplomowego
Samodzielny Publiczny Szpital Kliniczny
im. Prof. Adama Grucy w Otwocku

450 łóżek ortopedycznych

2017 rok

- 13 072 hospitalizowanych+ rehabilitacji
- 1 377 dzieci (10,5%)
- 8 643 operowanych
- 67 296 ambulatoryjnych

DZIĘKUJĘ ZA UWAGĘ

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NARZĄDU
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I BIOMECHANIKA
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 PZWL

Wydanie 2017r
zawiera;
819 stron
56 rozdziałów

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za uwagę